

BEAUFORT WEST MUNICIPALITY

Water Services Development Plan Executive Summary

For IDP incorporation as directed by the Water Services Act (Act 108 of 1997)

2022-2027

**Draft Report
30 October 2024**

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PROJECT P09661: BEAUFORT WEST MUNICIPALITY'S 2022-2027 WSDP EXECUTIVE SUMMARY

REV	DESCRIPTION	ORIG	REVIEW	IX ENGINEERS APPROVAL	DATE	CLIENT APPROVAL	DATE
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BEAUFORT WEST MUNICIPALITY

2022 – 2027 WATER SERVICES DEVELOPMENT PLAN (WSDP) EXECUTIVE SUMMARY

ITEM	DESCRIPTION	PAGE
List of Tables and Figures		iii
Abbreviations and Definitions		vii
Key Terms and Interpretations		ix
Introduction		1
Section A: Status Quo Overview		2
Topic 1: Settlements and Demographics		3
Topic 2: Service Levels		6
Topic 3: Water Services Asset Management		15
Topic 4: Water Services Operation and Maintenance		22
Topic 5: Conservation and Demand Management		22
Topic 6: Water Resources		25
Topic 7: Financial		31
Topic 8: Water Services Institutional Arrangements and Customer Services		35
Section B: State of Water Services Planning		43
Section C: Water Services Existing Needs Perspective		43
Topic 1: Settlements and Demographics		45
Topic 2: Service Levels		46
Topic 3: Water Services Asset Management		48
Topic 4: Water Services Operation and Maintenance		59
Topic 5: Conservation and Demand Management		62
Topic 6: Water Resources		72
Topic 7: Financial		76
Topic 8: Water Services Institutional Arrangements and Customer Services		84
Section D: Water Services Objectives and Strategies		85
Section E: Water Services MTEF Projects		90
Section F: WSDP Projects		93

Section A: Status Quo Overview

Table A.1.1	Settlement Summary	3
Table A.1.2	Summary by Settlement Group (Urban / Rural Split)	3
Table A.1.3	Assessment Score by Settlement Type.....	4
Table A.1.4	Amenities Summary (Health & Educational facilities).....	4
Table A.1.5	Historical population and household data of Beaufort West Municipality	4
Table A.1.6	Estimated future annual population growth percentages, population and households per distribution system	4
Table A.1.7	Water and Sanitation Services Overview	5
Table A.2.1	Norms and Standards for Levels of Water Supply Services	6
Table A.2.2	Norms and Standards for Levels of Sanitation Services	6
Table A.2.3	Residential Water Services Delivery Access Profile: Water	7
Table A.2.4	Residential water service levels.....	9
Table A.2.5	Improvement in Eradicating the Water Backlog	10
Table A.2.6	Water Supply Level Profile (Households)	10
Table A.2.7	Water Reliability Profile (Households)	10
Table A.2.8	Residential Water Services Delivery Access Profile: Sanitation	10
Table A.2.9	Residential sanitation service levels	12
Table A.2.10	Improvement in Eradicating the Sanitation Backlog	13
Table A.2.11	Sanitation Level of Service (Households).....	13
Table A.2.12	Sanitation Reliability Profile (Households).....	13
Table A.2.13	Direct Backlog (Water and Sanitation)	13
Table A.2.14	Number of user connections in each user sector served by Beaufort West Municipality (As confirmed by the Financial Department)	14
Table A.2.15	Education and health facilities water services	14
Table A.2.16	Education and health facilities sanitation services	14
Table A.3.1	Infrastructure Components	15
Table A.3.2	Existing main water infrastructure for the various water distribution systems	15
Table A.3.3	Existing main sewerage infrastructure.....	15
Table A.3.4	Refurbishment Need and O&M Occurrence.....	16
Table A.3.5	Opening Cost and Carrying Value of the Water Infrastructure	16
Table A.3.6	Overview of the RUL by Facility Type for the Water Infrastructure (OC)	17
Table A.3.7	Overview of the age distribution by facility type for the water infrastructure (OC)	18
Table A.3.8	Condition grading per water facility type.....	18
Table A.3.9	Opening Cost and Carrying Value of the sewerage infrastructure	19
Table A.3.10	Overview of the RUL by facility type for the sewerage infrastructure (OC)	20
Table A.3.11	Overview of the age distribution by facility type for the sewerage infrastructure (OC).20	
Table A.3.12	Condition grading per sewerage facility type	21
Table A.4.1	Operation and Maintenance	22
Table A.5.1	NRW, Water Losses and ILIs for the various water distribution systems.....	23

LIST OF TABLES AND FIGURES

Table A.5.2	System input volume, average billed metered consumption and NRW in litre per connection per day for the various water distribution systems for 2023/2024	24
Table A.5.3	Reducing NRW and Water Losses	24
Table A.6.1	Registered and licence volumes and safe yields of the various sources supplying Beaufort West	25
Table A.6.2	WULA volumes and safe yields of the various boreholes supplying Merweville	25
Table A.6.3	Registered volumes and safe yields of the various sources supplying Nelspoort.....	26
Table A.6.4	WULA volumes and safe yields of the various boreholes supplying Murraysburg	26
Table A.6.5	Current water resources and volumes	26
Table A.6.6	Additional water resources and volumes	27
Table A.6.7	Monitoring	27
Table A.6.8	Volume of raw water abstracted	28
Table A.6.9	Water Quality	28
Table A.6.10	Percentage Compliance of the Water Quality Samples for the last two financial Years per performance indicator	29
Table A.6.11	Four Categories under which the risks posed by Micro-organism, Physical or Aesthetic Property or Chemical Substance of potable water is normally classified	30
Table A.6.12	Beaufort West Municipality's compliance of the monthly E.Coli monitoring frequency for the water distribution systems in terms of the minimum requirements of SANS 241-2:2015 (Table 2).	30
Table A.6.13	Percentage Microbiological (Faecal Coliforms) compliance of the compliance samples taken at the Beaufort West and Murraysburg WWTWs for the last financial year	30
Table A.6.14	Microbiological, Chemical, Physical and Overall compliance percentages, as included in DWS's 2022 Green Drop Report and 2023 Green Drop Progress Report	31
Table A.7.1	Historical Capital expenditure of the water and sewerage infrastructure budgets	31
Table A.7.2	Summary of Operational and Maintenance expenditure and income budgets for water and sanitation services	31
Table A.7.3	Water Tariffs for 2023/2024 and the previous four financial years	32
Table A.7.4	Sewerage Tariffs for 2023/2024 and the previous four financial years	33
Table A.8.1	Description of No Drop Criteria	36
Table A.8.2	No Drop Performance of the Municipality (DWS's 2023 No Drop Report).	36
Table A.8.3	Blue Drop Performance of the Municipality (DWS's 2023 Blue Drop Report)	37
Table A.8.4	Average Residential Daily Consumption (l/p/d) for the last four financial years	38
Table A.8.5	Green Drop Performance of Beaufort West Municipality (DWS's 2022 Green Drop Report).	39
Table A.8.6	Green Drop Risk Rating of Beaufort West Municipality (DWS's 2023 Green Drop Progress Report)	41

Section B: State of Water Services Planning

Section C: Water Services Existing Needs Perspective

Table C.1.1	Settlement Demographics and Public Amenities	45
Table C.1.2	Beaufort West Municipality's Housing Needs	45
Table C.2.1	Service Levels Profile	46

LIST OF TABLES AND FIGURES

Table C.3.1	Water Services Asset Management	48
Table C.3.2	Key Groundwater Management Functions	51
Table C.3.3	Future bulk water pipeline and water reticulation infrastructure required	52
Table C.3.4	Existing hydraulic design capacities, average daily flows, required treatment capacity and water quality failures	53
Table C.3.5	Rehabilitation and upgrading required at the Nelspoort WTW	53
Table C.3.6	Recommendations from 2024 WTW Process Audits	54
Table C.3.7	Estimated cost of future reservoir storage capacities required	55
Table C.3.8	Future bulk sewer pipeline and sewer drainage network infrastructure required	55
Table C.3.9	Future sewer pump stations required	56
Table C.3.10	Existing hydraulic design capacities and flows at each of the WWTWs (Ml/d)	57
Table C.3.11	Average daily and peak month future projected WWTW flows (Ml/d)	57
Table C.3.12	Future upgrades of the WWTWs	59
Table C.4.1	Water Services O&M	59
Table C.4.2	Recommended budgets for the replacement and the operation and maintenance of the existing water and sewerage infrastructure	62
Table C.5.1	Conservation and Demand Management - Water Resource Management	62
Table C.5.2	Conservation and Demand Management - Water Balance	63
Table C.5.3	Proposed WC/WDM Strategy Items for Beaufort West Municipality	64
Table C.5.4	Commitment to reduce NRW and water inefficiencies	69
Table C.6.1	Water Resources	72
Table C.6.2	Projected future water requirements of towns	73
Table C.6.3	Years in which the annual water requirements are likely to exceed the safe yields of the various resources	74
Table C.6.4	Future groundwater augmentation options for Beaufort West.....	74
Table C.6.5	Potential future water resources for the various towns (Recommended summary options of DWS's All Towns Reconciliation Strategies, Feb 2015)	75
Table C.6.6	Minimum Monitoring Frequency for Process Risk Indicators (SANS241-2:2015: Table 1)	75
Table C.7.1	Financial Management Objectives and Interventions.....	77
Table C.7.2	Expenditure items by type, as included in the 2024/2025 budget	77
Table C.7.3	Estimated Capital Expenditure per Functional Classification of Beaufort West Municipality's future capital budget.....	78
Table C.7.4	Revenue items by source, as included in the 2024/2025 Budget	80
Table C.7.5	Sources of funding for the future capital budgets of Beaufort West Municipality	81
Table C.7.6	Comments on the Municipality's residential block step water tariff structure	81
Table C.7.7	2022/2023 Residential water tariff structures of three Municipalities that adequately promote the efficient use of water	82

Section D: Water Services Strategies

Table D.1	Strategies, Objectives and Key Performance Indicators for Beaufort West Municipality	86
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Section E: Water Services MTEF Projects

Table E.1	Summary of MTEF Projects	90
Table E.2a	Water Services MTEF Projects – FY 2024/25 (1 st year MTEF period)	91
Table E.2b	Water Services MTEF Projects – FY 2025/26 (2 nd year MTEF period)	91
Table E.2c	Water Services MTEF Projects – FY 2026/27 (3 rd year MTEF period)	92

Section F: WSDP Projects

Table F.1	WSDP FY2024/25: List of Conceptual Projects	94
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Figures

Figure A.2.1	Access to Water Services	8
Figure A.2.2	Access to Sanitation Services	11
Figure A.3.1	Carrying Value and Opening Cost of the Water Infrastructure	17
Figure A.3.2	Remaining Useful Life of the Water Infrastructure	17
Figure A.3.3	Age Distribution of the Water Infrastructure	18
Figure A.3.4	Condition Grading of the Water Infrastructure	19
Figure A.3.5	Carrying Value and Opening Cost of the Sewerage Infrastructure	19
Figure A.3.6	Remaining Useful Life of the Sewerage Infrastructure	20
Figure A.3.7	Age Distribution of the Sewerage Infrastructure	21
Figure A.3.8	Condition Grading of the Sewerage Infrastructure	21
Figure A.6.1	Beaufort West Municipality's Average Daily Bulk Raw Water Volume for all four Systems	27
Figure A.6.2	Annual Bulk Raw Water Supply Volume per System	28
Figure A.7.1	Water Cost for Residential Consumers	32
Figure A.8.1	Spider Diagram of the Vulnerability Levels of Beaufort West Municipality for 2023	35

ABBREVIATIONS AND DEFINITIONS

AADD	Average Annual Daily Demand
AMP	Asset Management Plan
AOI	Area of Interest
BD	Blue Drop
BDRR	Blue Drop Risk Rating
BGWMA	Breede-Gouritz Water Management Area
BH	Borehole
BOWMA	Breede-Olifants Water Management Area
BWLM	Beaufort West Local Municipality
CAP	Corrective Action Plan
CMA	Catchment Management Agency
COD	Chemical Oxygen Demand
CRC	Current Replacement Cost
CRR	Cumulative Risk Ratio
CV	Carrying Value
DCoG	Department of Cooperative Government
DMA	District Management Area
DRC	Depreciated Replacement Cost
DWQ	Drinking Water Quality
DWS	Department of Water and Sanitation
EC	Electrical Conductivity
EHP	Environmental Health Practitioner
FRP	Financial Recovery Plan
FY	Financial Year
GAMAP	General Accepted Municipal Accounting Practice
GD	Green Drop
GDIP	Green Drop Improvement Plan
GIS	Geographic Information Systems
H / HH	Household
IAMP	Infrastructure Asset Management Plan
IBT	Inclining Block Tariff
IDP	Integrated Development Plan
IDZ	Industrial Development Zone
ILI	Infrastructure Leakage Index
IMQS	Infrastructure Management Query System
IRIS	Integrated Regulatory Information System
IWA	International Water Association
KI	Kilolitre
KPI	Key Performance Indicator
l/c/d	Litre per Capita per Day
l/p/d	Litre per Person per Day
LGTAS	Local Government Turn Around Strategy
LM	Local Municipality
MA	Management Area
MFMA	Municipal Finance Management Act
MIG	Municipal Infrastructure Grant
MISA	Municipal Infrastructure Support Agent
MI	Mega Litre
MI/a	Mega Litre per Annum

ABBREVIATIONS AND DEFINITIONS

MI/d	Mega Litre per Day
MLE	Mixed Ludzack-Ettinger
Mm ³ /a	Million Cubic Metre per Annum
MNF	Minimum Night Flow
MTEF	Medium-Term Expenditure Framework
MTREF	Medium-Term Revenue Expenditure Framework
MuSSA	Municipal Strategic Self-Assessment
NMR	No Monitoring Required
NRW	Non-Revenue Water
NWRS	National Water Resource Strategy
O&M	Operation and Maintenance
OC	Opening Cost
PAT	Progress Assessment Tool
PDD	Peak Daily Demand
PRV	Pressure Reducing Valve
PS	Pump Station
PW	Potable Water
RAS	Return Activated Sludge
RDP	Reconstruction and Development Programme
RUL	Remaining Useful Life
RW	Raw Water
SALGA	South African Local Government Association
SANS	South African National Standard
SCADA	Supervisory Control and Data Acquisition
SDBIP	Service Delivery and Budget Implementation Plan
SDF	Spatial Development Framework
SIV	System Input Volume
SST	Secondary Settling Tank
TSS	Total Suspended Solids
UCT	University of Cape Town
VIP	Ventilated Improved Pit
WaSP	Water Safety Plan
WC/WDM	Water Conservation / Water Demand Management
WDM	Water Demand Management
WMA	Water Management Area
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSI	Water Services Institution
WSP	Water Services Provider
WSS	Water Supply System
WTW	Water Treatment Works
WULA	Water Usage Licence Application
W ₂ RAP	Wastewater Risk Abatement Plan
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, which 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- <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• Water supports development and the elimination of poverty and inequality.• Water contributes to the economy and job creation, and• Water is protected, used, developed, conserved, managed and controlled sustainably and equitably.				
International Water Association (IWA) Water Balance	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	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 in order to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services, and political acceptability.

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.



2022-2027 WATER SERVICES DEVELOPMENT PLAN EXECUTIVE SUMMARY

Introduction

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

Sections 12 and 13 of the Water Services Act (Act No 108 of 1997) place a duty on WSAs to prepare and maintain a WSDP. The DWS has developed a new WSDP website (Rolled-out to all WSAs during 2017) to assist WSAs with their WSDP process and to provide a framework for the capturing of the data.

This 2022-2027 WSDP of Beaufort West Municipality is an update of the previous WSDP. The WSDP was drafted according to the DWS's new WSDP website, as rolled out to the Municipalities in the Central Karoo Region on the 15th of November 2017. The WSDP is aligned and integrated with the 2024/2025 IDP of Beaufort West Municipality and needs to form an integrated part of the IDP public participation and consultation process. The IDP is predominantly strategic as opposed to the WSDP that are more operationally orientated with regard to water and sanitation services.

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

The 2022-2027 WSDP for Beaufort West Municipality consists of the following documents and processes.

- Executive Summary Report that can be used for Council approval and for the Public Participation Process;
- Administration, Information and Comprehensive Overview Report; and
- Future Demand and Functionality Requirements Report.
- Updated WSDP website.

The Executive Summary Report must be submitted to the Council for their approval and issued to the public for their comment.

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

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

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

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

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

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



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

The top ten risks of the Municipality are indicated below (2024/2025 IDP):

- Impact of drought;
- Financial viability in the long term;
- Ageing and deteriorating infrastructure;
- Technical excessive water losses (infrastructure);
- Disaster Management – Coordinated by the Central Karoo District Municipality, but only one official available for the entire district area;
- Lack of funding (need to expand the landfill site in the near future);
- Vandalism and the misuse of municipal property;
- Lack of conducive environment to attract economic investment;
- Illegal landfill sites operated at Murraysburg (funding already acquired and new regional landfill site identified), Merweville and Nelspoort;
- Non-compliance with laws and regulations.

SECTION A: STATUS QUO OVERVIEW

Beaufort West Municipality's Management Area includes the towns of Beaufort West, Merweville, Nelspoort and Murraysburg. The largest town is Beaufort West, which also serves as the administrative centre for Beaufort West Municipality. Beaufort West is situated approximately 450 kilometres northwest from Cape Town and is connected to Cape Town, Bloemfontein and Johannesburg via the N1 route.

Beaufort West Municipality's Management Area falls partially within the Breede-Olifants and Mzimvubu-Tsitsikamma Water Management Areas (WMAs). The Municipality consists of seven (7) individual wards and Beaufort West Municipality is the only WSA and WSP within this Municipal Management Area. Beaufort West Municipality's Management Area includes the following towns and urban areas (**Water Distribution Systems**):

- Beaufort West – Beaufort West System: The town relies on a large number of boreholes, as well as on surface water supplied from the Gamka Dam and two fountains. A water reclamation project, where secondary treated water from the Beaufort West WWTW is further treated to potable standard was commissioned on the 15th of January 2011 to further augment the existing water sources. The surface water is treated at the Beaufort West WTW.
- Merweville – Merweville System: The town currently relies on nine boreholes for bulk water supply to the town. There is no WTW and the groundwater is only disinfected with Sodium Hypochlorite.
- Nelspoort – Nelspoort System: The town relies on three boreholes, as well as on surface water supplied from the Sout River. The water is treated at the Nelspoort WTW. Disinfection is with chlorine gas or HTH granular.
- Murraysburg – Murraysburg System: Four production boreholes supply potable water to the town. There is no WTW and the groundwater is disinfected with Sodium Hypochlorite at the Riverside, Moddergat and Victoria West boreholes.

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



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

It is therefore advisable for Beaufort West Municipality and the Central Karoo District 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.

TOPIC 1: SETTLEMENTS AND DEMOGRAPHICS

The tables below gives an overview of the settlements, population and households in Beaufort West Municipality's Management Area for 2023/2024. The number of settlements were done according to the grouping of the different areas in DWS's GeoDatabase.

Table A.1.1: Settlement Summary		
Section	Value	Assessment Score
1.1 Total Population	58 212	80%
1.2 Total Number of Households (Permanent)	15 343	80%
1.3 Average Household Size	3.79	80%
1.4 Total Number of Settlements (GeoDatabase)	20	80%

Note: The score of 80% in the above table is Excellent, which is the highest score in DWS's eWSDP website.

Table A.1.2: Summary by Settlement Group (Urban / Rural Split)				
Settlement Type	Settlements	Population	Households	Assessment Score
Urban	19	50 631	13 112	80%
Rural	1	7 581	2 231	80%
Total	20	58 212	15 343	80%

Note: The score of 80% in the above table is Excellent, which is the highest score in DWS's eWSDP website.

**Table A.1.3: Assessment Score by Settlement Type**

Main Type	Settlement Type	Settlements	Population	Households	Avg. Household Size	Assessment Score
Rural	Farming	1	7 581	2 231	3.4	80%
Urban	Urban - Informal Settlements (Squatter Camp)	3	265	68	3.9	80%
Urban	Urban - Formal Town	16	50 366	13 044	3.9	80%
Total		20	58 212	15 343	3.8	80%

Note: The score of 80% in the above table is Excellent, which is the highest score in DWS's eWSDP website.

Table A.1.4: Amenities Summary (Health & Educational facilities)

Amenity Type	Number of Amenities	Assessment Score
Health Facilities	15	80%
Educational facilities	26	80%

Note: The scores of 60% and 80% in the above table are Good and Excellent.

The table below gives an overview of the historical population and household figures for Beaufort West Municipality for the various years.

Table A.1.5: Historical population and household data of Beaufort West Municipality

Year	Area	Source	Population	Households	Person / Household
2001	Previous Beaufort West MA	Census 2001 Community Profiles	37 099	9 074	4.09
2001	Previous Central Karoo DMA	Census 2001 Community Profiles	6 191	1 570	3.94
2001 Census Data Total			43 290	10 644	4.07
2007	Previous Beaufort West MA	2007 Community Survey	37 090	9 149	4.05
2007	Previous Central Karoo DMA	2007 Community Survey	5 609	1 845	3.04
2007 Community Survey Total			42 699	10 994	3.88
2011 Census Data (Former DMA Included)			49 586	13 091	3.79
2016 Community Survey data (DMA Included)			51 080	14 935	3.42
2022 Census Data (DMA Included)			72 972	19 216	3.80

The population figures above is indicative of some migration into the Municipal Area. The published 2022 Census population for Beaufort West Municipality was 72 972 persons (Annual growth rate of 3.8% over the period 2011 to 2022) and the number of permanent households was 19 216. This figure is also aligned with the 2024/2025 IDP. The 2022 Census data is not yet available per town and it was therefore not possible to update Beaufort West Municipality's projected population and households per town (system) at this stage.

The 2023/2024 population for the various water distribution systems were estimated by applying the annual growth rates as indicated in the table below to the 2011 Census data. The current population figures and the annual population growth percentages used are aligned with the figures used in DWS's GeoDatabase.

The future estimated annual population growth percentages, as listed in the table below, were agreed with the Municipality's Engineering Department during January 2014.

Table A.1.6: Estimated future annual population growth percentages, population and households per distribution system

Distribution System	Estimated future annual population growth %	Projected 2023/20234 population	Projected 2023/20234 households
Beaufort West	1.50%	40 753	10 619
Merweville	1.50%	1 903	532
Nelspoort	1.00%	1 914	460
Murraysburg	1.50%	6 061	1 501
Farms	0.50%	7 581	2 231
Total	1.24%	58 212	15 343

The current 2022/2023 population for Beaufort West Municipality is therefore estimated at 58 212 persons and the permanent households at 15 343, as indicated in the table above.

2022-2027 WATER SERVICES DEVELOPMENT PLAN: EXECUTIVE SUMMARY



The table below gives an overview of the projected population and permanent number of households and the water and sanitation service levels in Beaufort West Municipality's Management Area.

Table A.1.7: Water and Sanitation Services Overview

Settlement Type	2011/2012		2023/2024		Water category										Sanitation 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	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		Adequate			Below RDP			None						
	0	0	0	0																					
Sub-Total	0	0	0	0																					
Formal Town					Adequate			Below RDP			None		Adequate			Below RDP			None						
Beaufort West	8 867	34 025	10 596	40 665	P	P									P	P									
Merweville	435	1 552	523	1 871	P	P									P	P									
Nelspoort	408	1 699	460	1 914	P	P									P	P									
Murraysburg	1 249	5 039	1 465	5 916	P	P									P	P									
Sub-Total	10 959	42 315	13 044	50 366																					
Townships					Adequate			Below RDP			None		Adequate			Below RDP			None						
	0	0	0	0																					
Sub-Total	0	0	0	0																					
Informal Settlements					Adequate			Below RDP			None		Adequate			Below RDP			None						
Beaufort West	15	60	23	88		P																	P		
Merweville	10	40	9	32		P																	P		
Murraysburg	6	30	36	145		P							P			P							P		
Sub-Total	31	130	68	265																					
Working towns & service centres					Adequate			Below RDP			None		Adequate			Below RDP			None						
Sub-Total	0	0	0	0																					
Sub-Total: (Urban)	10 990	42 445	13 112	50 631																					
RURAL																									
Rural / Farming					Adequate			Below RDP			None		Adequate			Below RDP			None						
Beaufort West Rural	2 101	7 141	2 231	7 581	P	P							P		P		P							P	
Sub-Total	2 101	7 141	2 231	7 581																					
Informal Settlements					Adequate			Below RDP			None		Adequate			Below RDP			None						
	0	0	0	0																					
Sub-Total	0	0	0	0																					
Sub-Total (Rural)	2 101	7 141	2 231	7 581																					
TOTAL	13 091	49 586	15 342	58 213																					



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		
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.		

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.

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 completely eliminated by 2030.		

Proper disposal, clean platform, vector and rodent control, resource use and health protection.

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 the formal households in the urban areas of Beaufort West Municipality's Management Area are provided with water and sewer connections inside the erven. Informal areas are supplied with shared services as an intermediary measure. There are an estimated 23 households in informal areas in Beaufort West, 9 in Merweville and 36 in Murraysburg. All these households have access to communal water services, except 29 of the 36 households in Murraysburg. None of these households have access to communal toilet facilities, except 7 of the households in Murraysburg. Beaufort West Municipality works towards a ratio of at least 1 tap per twenty-five households and 1 communal toilet per five households for their shared services. Beaufort West Municipality is committed to ensure that private landowners provide at least basic water and sanitation services to those households in the rural areas with existing services below RDP standard.

Beaufort West Municipality's challenges with regard to the provision of basic water and sanitation services are as follows:

- To provide basic water and sanitation services in the informal areas to new citizens moving into the informal areas and to ensure that health and hygiene awareness and education is part of the process of providing basic services.
- To identify suitable land for the relocation of the people from informal areas, with existing communal services, to formal houses with a higher level of water and sanitation service (Services inside the erven).
- To identify adequate funding for the rehabilitation, maintenance, replacement and upgrading of the existing bulk and reticulation infrastructure in order to support the sustainability of the water and sanitation services.
- To monitor the provision of basic water and sanitation on privately owned land.

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

Table A.2.3: Residential Water Services Delivery Access Profile: Water							
Census Category	Description	Year 0 FY2023/24		Year - 1 FY2022/23		Year - 2 FY2021/22	
		Nr	%	Nr	%	Nr	%
	WATER (ABOVE MIN LEVEL)						
Piped (tap) water inside dwelling/institution	House connections	12 545	82%	12 390	82%	12 236	82%
Piped (tap) water inside yard	Yard connections	2 623	17%	2 591	17%	2 558	17%
Piped (tap) water on community stand: distance less than 200m from dwelling/institution	Standpipe connection < 200 m	83	1%	83	1%	83	1%
	Sub-Total: Minimum Service Level and Above	15 251	99%	15 063	99%	14 877	99%
	WATER (BELOW MIN LEVEL)						
Piped (tap) water on community stand: distance between 200m and 500m from dwelling/institution	Standpipe connection: > 200 m < 500 m	58	0%	58	0%	58	0%
Piped (tap) water on community stand: distance between 500m and 1000m (1km) from dwelling /institution	Standpipe connection: > 500 m < 1 000 m	0	0%	0	0%	0	0%
Piped (tap) water on community stand: distance greater than 1000m (1km) from dwelling/institution	Standpipe connection: > 1 000 m	0	0%	0	0%	0	0%
No access to piped (tap) water	No services	34	0%	34	0%	34	0%
	Sub-Total: Below Minimum Service Level	92	1%	92	1%	92	1%
	Total number of households	15 343	100%	15 155	100%	14 969	100%

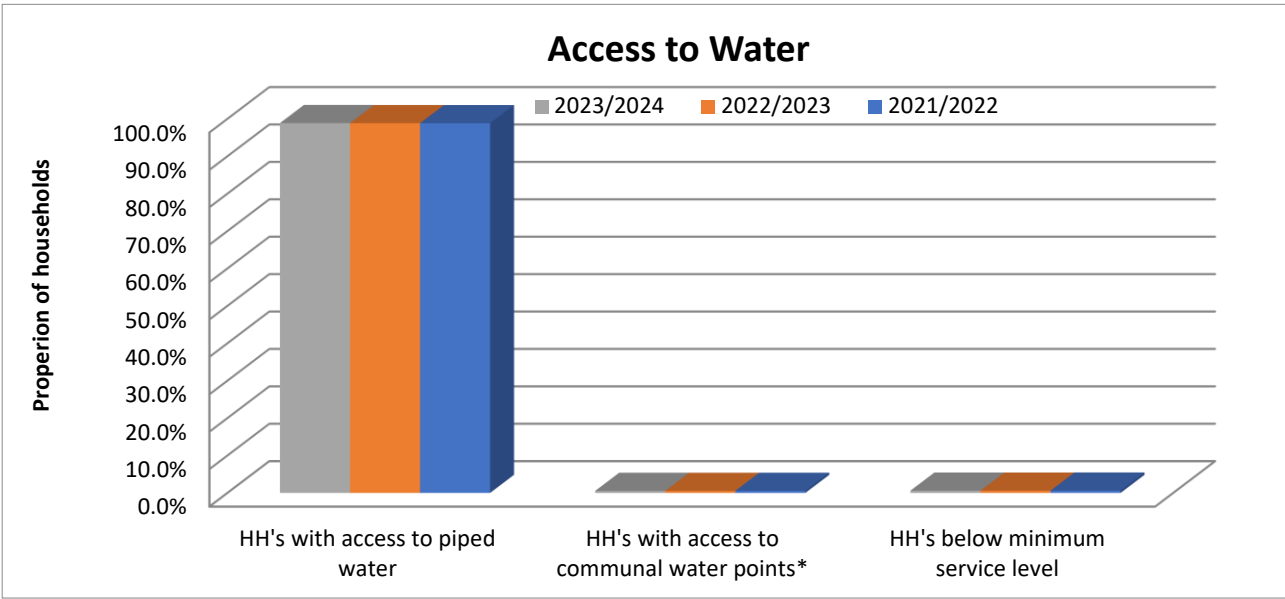


Figure A.2.1: Access to Water Services.

2022-2027 WATER SERVICES DEVELOPMENT PLAN: EXECUTIVE SUMMARY



The current residential water service levels in Beaufort West Municipality's Management Area are estimated as follows (June 2024).

Table A.2.4: Residential water service levels													
Classification	Definitions	Beaufort West		Merweville		Nelspoort		Murraysburg		Farms		Total	
		Pop	HH	Pop	HH	Pop	HH	Pop	HH	Pop	HH	Pop	HH
No Water Services	Whole community never had any formal (Municipal) water supply system	0	0	0	0	0	0	0	0	116	34	116	34
Below RDP: Infrastructure Upgrade	Existing infrastructure not on RDP std:												
	Network: Too small pipes	0	0	0	0	0	0	0	0	0	0	0	0
	Storage: Add to exist / elevation	0	0	0	0	0	0	0	0	0	0	0	0
	Source: Infra. To increase exist yield	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure Extension	Communities have grown structurally and there are hh that do not have water:												
	Network: New Infrastructure	0	0	0	0	0	0	0	0	99	29	99	29
	Storage: New & Adjacent	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure Refurbishment	Water can be restored to RDP by:									0	0	0	0
	Repair / Replace with same existing infrastructure	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: O&M Needs	Water can be restored to RDP (Where infra. Ok) by enough & efficient staff and sufficient funds for O&M	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Water Resource Needs	Includes Source development, Local available source, new bh, pipeline, WC/WDM, Water Source quality and drinking water quality	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs		0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs and Water Resource Needs		0	0	0	0	0	0	0	0	0	0	0	0
Total Basic Need (RDP)		0	0	0	0	0	0	0	0	215	63	215	63
Below Housing Interim ⁴⁾	No Services: Squatter (un-orderly layout) to be addressed with temp infra	0	0	0	0	0	0	117	29	0	0	117	29
Adequate Housing Permanent ⁵⁾	Temporary Services Provided: Orderly layout where housing scheme is needed. E.g. overcrowded yard, informal areas with existing communal services	88	23	32	9	0	0	28	7	0	0	148	39
Total Housing Need		88	23	32	9	0	0	145	36	0	0	265	68
Adequate	Standpipes	0	0	0	0	0	0	0	0	150	44	150	44
	Yard Connection ⁶⁾	6 110	1 592	308	86	558	134	622	154	2 232	657	9 830	2 623
	House Connection ¹⁾	34 555	9 004	1 563	437	1 356	326	5 294	1 311	4 984	1 467	47 752	12 545
Total Adequate		40 665	10 596	1 871	523	1 914	460	5 916	1 465	7 366	2 168	57 732	15 212
Totals		40 753	10 619	1 903	532	1 914	460	6 061	1 501	7 581	2 231	58 212	15 343

Notes: 1) Number of residential consumer units for the financial year 2023/2024, as confirmed by the Financial Department.

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

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

4) Below Housing Interim in the above table is the number of households in informal areas without basic water services. There are only 29 households in Murraysburg without basic water services.

5) Adequate Housing Permanent in the above table is the number of informal households in informal areas with communal water services. There are 39 informal households with communal water services.

6) Projected number of residential households (2023/2024) – Number of residential consumers units (Confirmed by Financial Department) = Estimated number of backyard dwellers..



Table A.2.5: Improvement in Eradicating the Water Backlog					
Settlement	Urban / Rural	2023/24		2022/23 (-Y1)	
		Water backlog HH	Water Backlog Population	Water backlog HH	Water Backlog Population
Beaufort West	Urban	0	0	0	0
Merweville	Urban	0	0	0	0
Nelspoort	Urban	0	0	0	0
Murraysburg	Urban	29	117	29	117
Farms	Rural	63	215	63	215
		92		92	

Table A.2.6: Water Supply Level Profile (Households)		
Water Profile	Totals	Assessment Score
Total households with a water need (Irrelevant the type of need)	92	60%
Total households below RDP	92	60%
Piped water inside the dwelling/house	12 545	80%
Piped water inside yard	2 623	60%
Piped water distance <200m	83	60%
Piped water distance >200m	58	60%
Water Other (include no water)	34	60%

Note: The scores of 60% and 80% in the above table is Good and Excellent. 80% is the highest score in DWS's eWSDP website.

Table A.2.7: Water Reliability Profile (Households)		
Section: Water Reliability Profile	Totals	Assessment Score
Total Number of Households having Reliable Service	15 251	80%
Total Number of Households NOT having Reliable Service	92	60%

Note: The scores of 60% and 80% in the above table is Good and Excellent. 80% is the highest score in DWS's eWSDP website.

The projected figures in the previous tables for water services for the farms are still based on the 2011 Census data and can only be updated once the 2022 Census data becomes available per town or subplace.

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

Table A.2.8: Residential Water Services Delivery Access Profile: Sanitation							
Census Category	Description	Year 0 FY2023/24		Year - 1 FY2022/23		Year - 2 FY2021/22	
		Nr	%	Nr	%	Nr	%
	SANITATION (ABOVE MIN LEVEL)						
Flush toilet (connected to sewerage system)	Waterborne	12 792	83%	12 625	83%	12 460	83%
	Waterborne: Low Flush	0	0%	0	0%	0	0%
Flush toilet (with septic tank)	Septic tanks / Conservancy	1 613	11%	1 592	11%	1 571	10%
Chemical toilet		44	0%	44	0%	44	0%
Pit toilet with ventilation (VIP)	Non-waterborne (above min. service level)	350	2%	350	2%	350	2%
Other / Communal Services		7	0%	7	0%	7	0%
	Sub-Total: Minimum Service Level and Above	14 806	97%	14 618	96%	14 432	96%
	SANITATION (BELOW MIN LEVEL)						
Pit toilet without ventilation	Pit toilet	125	1%	125	1%	125	1%
Bucket toilet	Bucket toilet	56	0%	56	0%	56	0%
Other toilet provision (below min. service level)	Other	20	0%	20	0%	20	0%
No toilet provisions	No services	336	2%	336	2%	336	2%
	Sub-Total: Below Minimum Service Level	537	3%	537	4%	537	4%
	Total number of households	15 343	100%	15 155	100%	14 969	100%

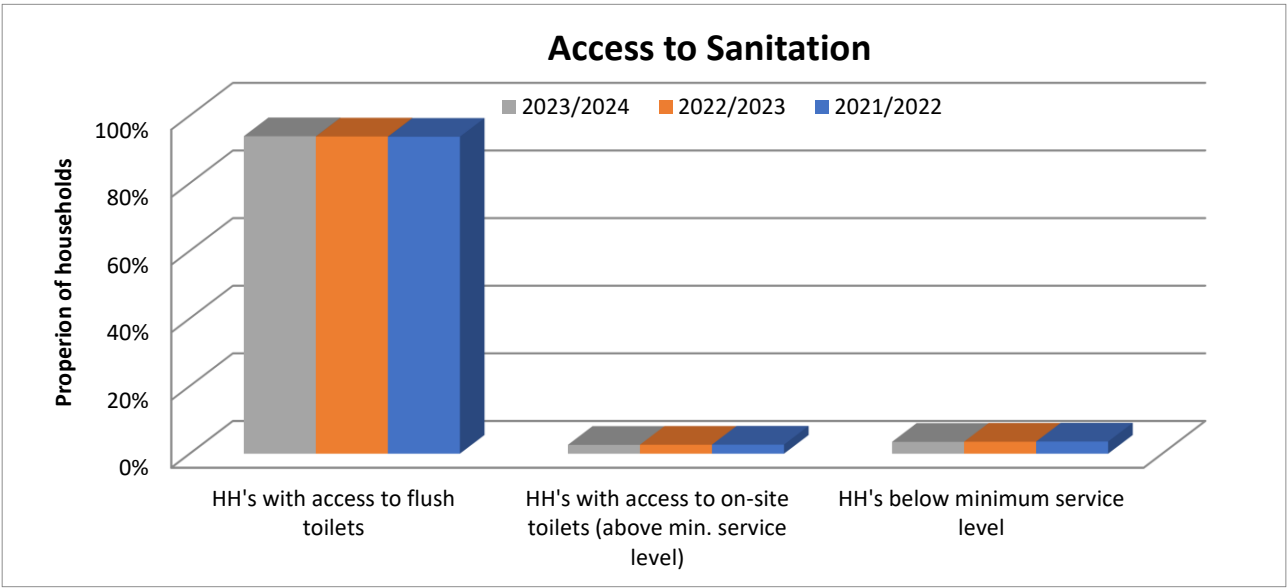


Figure A.2.2: Access to Sanitation Services.

2022-2027 WATER SERVICES DEVELOPMENT PLAN: EXECUTIVE SUMMARY



The current sanitation service levels in Beaufort West Municipality's Management Area are estimated as follows (June 2024).

Table A.2.9: Residential sanitation service levels													
Classification	Definitions	Beaufort West		Merweville		Nelspoort		Murraysburg		Farms		Total	
		Pop	HH	Pop	HH	Pop	HH	Pop	HH	Pop	HH	Pop	HH
No Sanitation Services	Whole community has never had any formal (Municipal) sanitation supply system	0	0	0	0	0	0	0	0	934	275 ³⁾	934	275
Below RDP: Infrastructure Upgrade	Existing infrastructure not on RDP standard. Typically, unimproved pit or chemical toilet. Communities have sanitation but below the minimum standard. This will normally be a bucket or an ecological toilet	0	0	0	0	0	0	0	0	833	245 ⁴⁾	833	245
	Communities at RDP standard but not appropriate due to local circumstances e.g. shallow ground water levels	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure Ext.	Community partially served to RDP level	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure Refurb.	Sanitation can be restored to RDP by repair / replace with the same infrastructure.	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: O&M Needs	Water can be restored to RDP (Where infra. ok) by enough & efficient staff and sufficient funds for O&M (Incl. pit-emptying and appropriate actions for waterborne)	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Water Resource Needs	Adequate infrastructure but not working due to inadequate water in the system	0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs		0	0	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs and Water Resource Needs		0	0	0	0	0	0	0	0	0	0	0	0
Total Basic Need (RDP)		0	0	0	0	0	0	0	0	1 767	520	1 767	520
Below Housing Interim ⁶⁾	No Services: Squatter (un-orderly layout) to be addressed with temp infra	88	23	32	9	0	0	117	29	0	0	237	61
Adequate Housing Permanent ⁷⁾	Temporary Services Provided: Orderly layout where housing scheme is needed. E.g. overcrowded yard, informal areas with existing communal services	0	0	0	0	0	0	28	7	0	0	28	7
Total Housing Need		88	23	32	9	0	0	145	36	0	0	265	68
Adequate	Non Waterborne	0	0	0	0	0	0	0	0	1 189	350 ⁵⁾	1 189	350
	Waterborne Low Flush	0	0	0	0	0	0	0	0	0	0	0	0
	Septic Tanks / Conservancy ¹⁾	668	174	247	69	8	2	28	7	4 625	1 361	5 576	1 613
	Waterborne WWTWs	39 997	10 422	1 624	454	1 906	458	5 888	1 458	0	0	49 415	12 792
Total Adequate ²⁾		40 665	10 596	1 871	523	1 914	460	5 916	1 465	5 814	1 711	56 180	14 755
Totals		40 753	10 619	1 903	532	1 914	460	6 061	1 501	7 581	2 231	58 212	15 343

Notes: 1) Census 2011: Number of households with septic / conservancy tanks; 2) Include Backyard dwellers; 3) Census 2011: Number of households with no toilet facility 275; 4) Census 2011: Number of households with existing buckets 56, chemical toilets 44, pit toilets without ventilation 125 and "other" 20; 5) Census 2011: Number of households with pit toilets with ventilation 350; 6) Below Housing Interim in the above table is the number of households in informal areas without basic sanitation services. There are 61 informal households with no communal sanitation services;

7) Adequate Housing Permanent in the above table is the number of informal households in informal areas with communal sanitation services. There is 7 households in Murraysburg with communal sanitation services.



Table A.2.10: Improvement in Eradicating the Sanitation Backlog					
Settlement	Urban / Rural	2023/24		2022/23 (-Y1)	
		Sanitation backlog HH	Sanitation Backlog Population	Sanitation backlog HH	Sanitation Backlog Population
Beaufort West	Urban	23	88	23	88
Merweville	Urban	9	32	9	32
Nelspoort	Urban	0	0	0	0
Murraysburg	Urban	29	117	29	117
Farms	Rural	520	1 767	520	1 767
		581		581	

Table A.2.11: Sanitation Level of Service (Households)		
Section: Sanitation Service Infrastructure Supply Level Profile	Totals	Assessment Score
Bucket toilets	56	60%
Pit without ventilation	125	60%
Pit toilet with ventilation (VIP)	350	60%
Chemical Toilet	44	60%
Flush toilet (with septic / conservancy tank)	1 613	80%
Flush toilet (connected to sewerage system)	12 799	80%
None (Include other)	356	60%

Note: The scores of 60% and 80% in the above table is Good and Excellent. 80% is the highest score in DWS's eWSDP website.

Table A.2.12: Sanitation Reliability Profile (Households)		
Section: Sanitation Reliability Profile	Totals	Assessment Score
Total number of households having reliable service	14 762	80%
Total number of households not having reliable service	581	60%
Infrastructure to be upgraded: None to VIP	356	60%
Infrastructure requirement: Bucket to VIP	56	60%
Infrastructure to be upgraded: Pit to VIP	125	60%
Number of households NOT having reliable service due to: Functionality	44	60%

Note: The scores of 60% and 80% in the above table is Good and Excellent. 80% is the highest score in DWS's eWSDP website.

The projected figures in the previous tables for sanitation services for the farms are still based on the 2011 Census data and can only be updated once the 2022 Census data becomes available per town or subplace.

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)	92	60%
Direct settlement backlog water population. Total population of settlement with a water need (irrelevant the type of need)	332	60%
Direct settlement backlog sanitation households. Total household of settlement with a sanitation need (irrelevant the type of need)	581	60%
Direct settlement backlog sanitation population. Total population of settlement with a sanitation need (irrelevant the type of need)	2 004	60%



The number of consumers in each user sector, for the various distribution systems in Beaufort West Municipality's Management Area, are as indicated in the table below (As confirmed by the Financial Department).

Table A.2.14: Number of user connections in each user sector served by Beaufort West Municipality (As confirmed by the Financial Department)				
Description	No of Residential Consumer Units	No of dry Industrial / Commercial Consumer Units	No. other Units	Total
Beaufort West	9 004	320	1 198	10 522
Merweville	437	2	102	341
Nelspoort	326	1	82	409
Murraysburg	1 311	23	340	1 674
Farms	299	4	1 118	1 421
TOTALS	11 377	350	3 840	14 567

Public Amenities

Table A.2.15: Education and health facilities water services					
Associated services facility	Number of facilities	Facilities with adequate services	Facilities with no services	Facilities with inadequate services	Total potential cost (basic level) (Rmil)
Education Plan					
Primary school	16	14	2 (To be verified)		Unknown
Secondary school	5	5	-	-	-
Tertiary	-	-	-	-	-
Combined	-	-	-	-	-
Special needs	-	-	-	-	-
Other	5	5	-	-	-
Total	26	24	2 (To be verified)		Unknown
Health Plan					
Hospitals	3	3	-	-	-
Health Centres	1	1	-	-	-
Clinics	8	8	-	-	-
Mobile & Satellite Clinics	3	3	-	-	-
Total	15	15	-	-	-

All the schools and Community Learning Centres in the urban areas are supplied with higher levels of water services. The water service levels of the two primary schools in the rural areas however need to be verified. All the hospitals and clinics in the urban areas receive potable water through the reticulation networks of the various towns.

Table A.2.16: Education and health facilities sanitation services					
Associated services facility	Number of facilities	Facilities with adequate services	Facilities with no services	Facilities with inadequate services	Total potential cost (basic level) (Rmil)
Education Plan					
Primary school	16	14	2 (To be verified)		Unknown
Secondary school	5	5	-	-	-
Tertiary	-	-	-	-	-
Combined	-	-	-	-	-
Special needs	-	-	-	-	-
Other	5	5	-	-	-
Total	26	24	2 (To be verified)		Unknown
Health Plan					
Hospitals	3	3	-	-	-
Health Centres	1	1	-	-	-
Clinics	8	8	-	-	-
Mobile & Satellite Clinics	3	3	-	-	-
Total	15	15	-	-	-



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

TOPIC 3: WATER SERVICES ASSET MANAGEMENT

Assets	Boreholes	Abstraction Points	WTW	Water Pump Stations	Sewer Pump Stations	Water Bulk & Network Pipelines	Sewer Drainage Network	Reservoirs	WWTW	Assessment Score
Total number of components / km of pipeline / units	69	4	5	10	6	325.824km	171.106km	16	4	80%

The table below gives an overview of the major water infrastructure components of the various water distribution systems in Beaufort West Municipality's Management Area.

Water Distribution System	Resources	WTW		Bulk and Reticulation	Number of Water PS	Reservoir and Water Tower Storage	
		Capacity	Treatment Processes			MI	No.
Beaufort West	Gamka Dam, Fountains, large number of Boreholes and Reclamation Plant	Beaufort West WTW 4.320 MI/d	Coagulation, flocculation, sedimentation, filtration, stabilisation, disinfection, sludge drying beds and reactive treatment.	269.941	5 (RW) 2 (PW)	3*	14.750
		Reclamation WTW 2.144 MI/d	Sand filtration, ultra-filtration, reverse osmosis, pH correction, UV disinfection and chlorination.				
Merweville	Nine Boreholes	-	Sodium Hypochlorite disinfection	10.550	-	2	0.600
Nelspoort	Sout River and Three Boreholes	Nelspoort WTW 0.500 MI/d	Aeration, filtration and disinfection	10.567	1 (RW) 1 (PW)	1	0.911
Murraysburg	Four Boreholes	-	Sodium Hypochlorite disinfection	34.766	-	3 **	1.200
Total				325.824	9	9	17.461

Note: * Beaufort West: Exclude the raw water reservoirs

** Murraysburg: Exclude the steel reservoir currently not in use.

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

Sewer Drainage Systems	Sewer Drainage Network (km)		Number of Sewer PS	WWTWs and Treatment Processes		
	Rising	Gravity		Hydraulic Design Capacity	Organic Design Capacity (kg COD/d)	Treatment Processes
Beaufort West	1.100	126.700	3	4.659	Unknown	Activated Sludge: Archimedes screw PS, Inlet works (Mechanical front raked screen), Bio Reactor, SST, Sludge drying beds, Disinfection (Chlorine gas), Maturation Pond.
Merweville	0.000	4.400	-	0.111	Unknown	Oxidation pond system: Inlet works with hand raked screen and two unlined primary ponds, one secondary pond, two tertiary ponds and one final irrigation pond.
Nelspoort	1.831	4.200	2	0.240	176	Oxidation pond system: Inlet works with hand raked screen and two grit channels, three lined



Table A.3.3: Existing main sewerage infrastructure						
Sewer Drainage Systems	Sewer Drainage Network (km)		Number of Sewer PS	WWTWs and Treatment Processes		
	Rising	Gravity		Hydraulic Design Capacity	Organic Design Capacity (kg COD/d)	Treatment Processes
						primary ponds, one secondary pond, two tertiary ponds and one evaporation pond.
Murraysburg	2.875	30.000 (Est)	1	0.500	280	Oxidation pond system: Two anaerobic ponds, one primary pond, two secondary ponds, three tertiary ponds and one irrigation pond.
Total	5.806	165.300	6	5.510	-	-

The table below gives an overview of the refurbishment needs and O&M occurrence of the existing water and sewerage infrastructure.

Table A.3.4: Refurbishment Need and O&M Occurrence												
Component	Refurbishment Need				O&M Occurrence				Observation			
	High	Medium	Low	None	Regular	Periodic	Sporadic	None	Dysfunctional	Operational	Prime Condition	Vandalised
Boreholes	20	8	44	12	0	0	69	0	13	26	18	12
Abstraction points	0	1	2	1	0	0	4	0	0	4	0	0
Bulk and reticulation pipelines *	0	1	3	0	0	0	4	0	0	4	0	0
Reservoirs	3	3	4	6	0	0	16	0	1	10	5	0
Water pump stations	3	2	2	3	0	0	10	0	0	7	3	0
WTW	1	2	0	2	0	0	5	0	0	3	2	0
Sewer pipelines *	0	0	3	0	0	0	3	0	0	3	0	3
Sewer pump stations	2	1	3	0	0	0	6	0	0	6	0	0
WWTW	1	1	1	1	0	0	4	0	0	3	1	0

Note: * Number of Water Supply Schemes and Sewer Drainage Areas

Asset Management: An updated Asset Management Policy is in place (Reviewed and amended June 2023).

Asset Register: Beaufort West Municipality updated their current Asset Register after June 2023, in order to include the new assets constructed during the 2022/2023 financial year. The tables and graphs that follow give an overview of the current water and sewerage infrastructure included in Beaufort West Municipality's Asset Register.

Water Infrastructure: The Opening Cost and Carrying Value of the water infrastructure included in Beaufort West Municipality's current Asset Register (June 2023) is summarised in the table below.

Table A.3.5: Opening Cost and Carrying Value of the water infrastructure			
Asset Type	Opening Cost	Carrying Value	% CV/OC
Bulk Water Pipelines	R34 015 907	R20 778 939	61.09%
Borehole	R23 166 084	R18 600 474	80.29%
Water Pump Stations	R6 548 546	R4 148 100	63.34%
Reservoirs	R42 839 316	R26 011 128	60.72%
Water Pipeline	R11 000 744	R5 441 592	49.47%
Dams and Weirs	R7 010 935	R2 055 858	29.32%
WTW Beaufort West (WTW-001)	R16 080 477	R8 817 844	54.84%
WTW Nelspoort (WTW-002)	R2 834 149	R1 081 107	38.15%
Totals	R143 496 158	R86 935 042	60.58%

The previous table indicates that 39.42% of the value of the water infrastructure has been consumed.

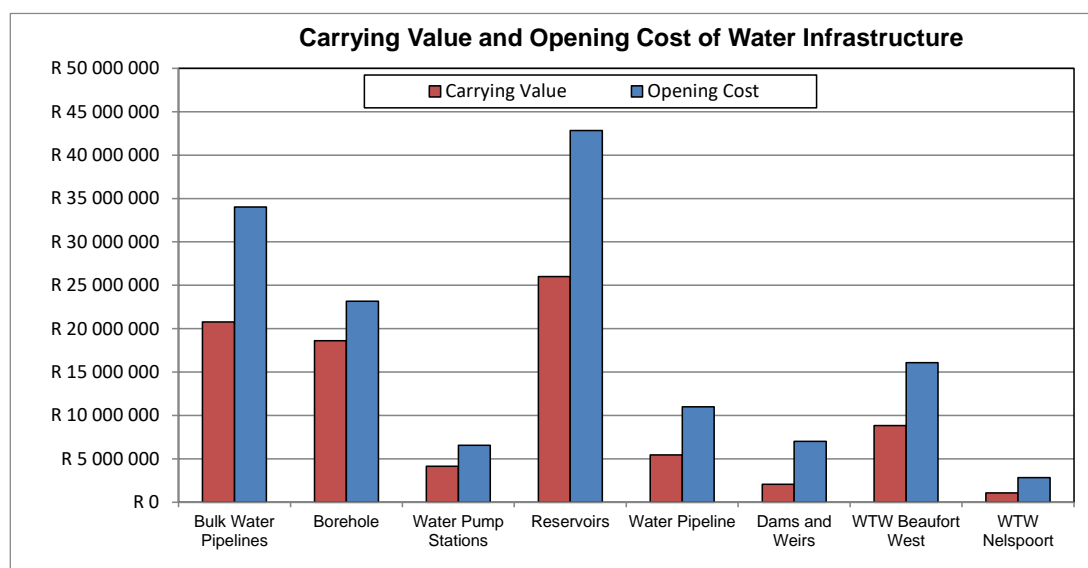


Figure A.3.1: Carrying Value and Opening Cost of the Water Infrastructure

The table and graph below give an overview of the RUL by facility type for the water infrastructure.

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Bulk Water Pipelines	R25 954	R77 597	R373 152	R38 566	R33 500 638
Borehole	R741 587	R4 799 462	R1 433 109	R762 357	R15 429 569
Water Pump Stations	R890 618	R2 776 470	R358 334	R701 829	R1 821 295
Reservoirs	R276 294	R973 602	R1 441 470	R782 709	R39 365 241
Water Pipeline	R194 605	R179 081	R832 156	R0	R9 794 902
Dams and Weirs	R0	R72 394	R4 857 155	R0	R2 081 386
WTW Beaufort West (WTW-001)	R2 015 926	R8 204 241	R1 890 261	R576 795	R3 393 254
WTW Nelspoort (WTW-002)	R432 690	R1 487 374	R30 605	R430 914	R452 566
Totals	R4 577 674	R18 570 221	R11 216 242	R3 293 170	R105 838 851

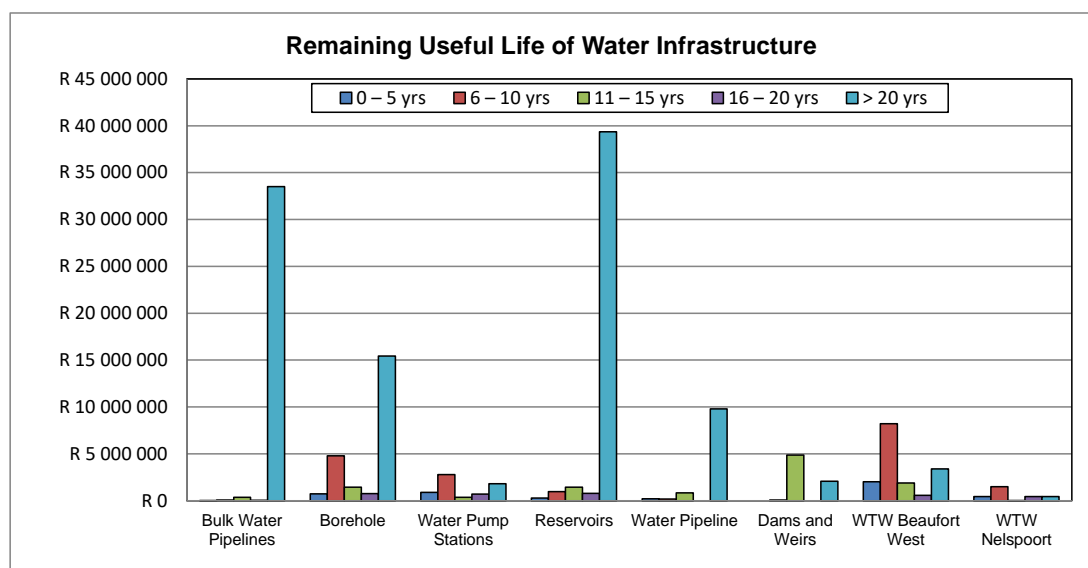


Figure A.3.2: Remaining Useful Life of the Water Infrastructure

The asset renewal needs for the water infrastructure assets over the next ten years is R2.315 million per year. The reinvestment required is R4.578 million in the first five years and R18.570 million in the second five-year period.

The table and graph below give an overview of the age distribution by facility type for the water infrastructure.

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Bulk Water Pipelines	R10 559 544	R46 638	R331 196	R150 816	R22 927 713
Borehole	R16 746 695	R4 758 890	R309 562	R898 373	R452 564
Water Pump Stations	R2 893 814	R2 708 322	R229 110	R418 819	R298 481
Reservoirs	R13 579 954	R1 775 479	R219 730	R376 266	R26 887 887
Water Pipeline	R1 731 635	R236 321	R129 542	R93 775	R8 809 471
Dams and Weirs	R68 158	R0	R2 342	R4 236	R6 936 199
WTW Beaufort West (WTW-001)	R5 487 689	R6 519 691	R888 268	R1 019 971	R2 164 858
WTW Nelspoort (WTW-002)	R382 183	R1 541 529	R80 940	R17 334	R812 163
Totals	R51 449 672	R17 586 870	R2 190 690	R2 979 590	R69 289 336

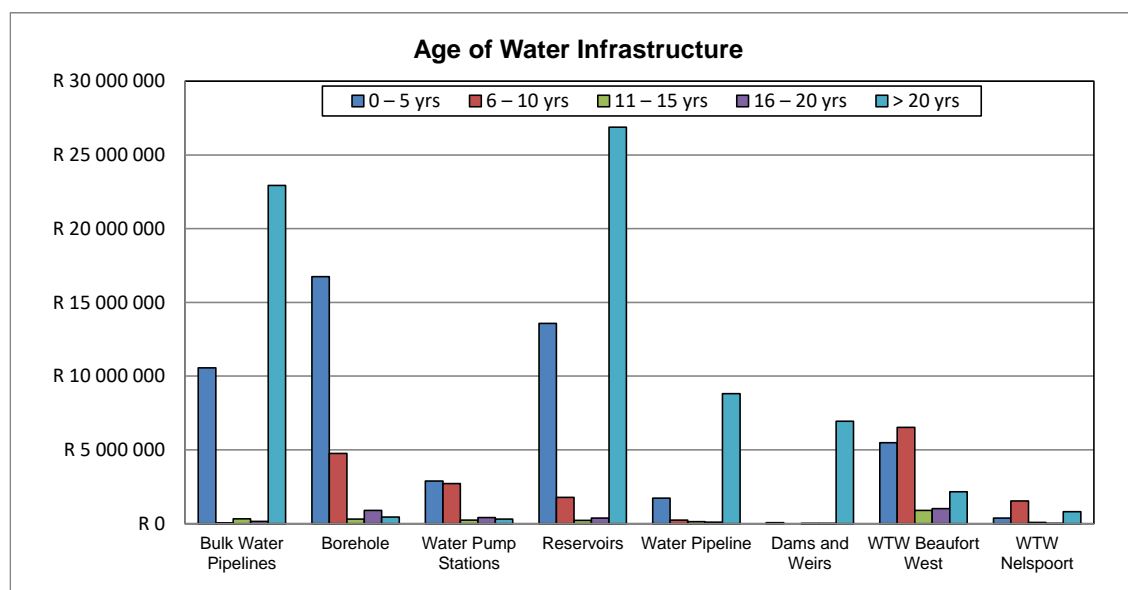


Figure A.3.3: Age Distribution of the Water Infrastructure

The age of 48.29% of the water infrastructure assets is greater than twenty years.

The table and graph below give an overview of the condition grading per facility for the water infrastructure.

Asset Type	Very Poor	Poor	Fair	Good	Very Good
Bulk Water Pipelines	R17 882	R127 625	R23 199 071	R111 785	R10 559 544
Borehole	R44 409	R359 181	R4 115 463	R3 673 264	R14 973 767
Water Pump Stations	R0	R273 640	R1 683 659	R3 477 086	R1 114 161
Reservoirs	R161 404	R1 301 356	R25 838 369	R1 967 554	R13 570 633
Water Pipeline	R0	R77 104	R9 119 875	R1 803 765	R0
Dams and Weirs	R0	R4 859 049	R2 083 729	R68 157	R0
WTW Beaufort West (WTW-001)	R0	R377 599	R5 620 932	R9 627 526	R454 420
WTW Nelspoort (WTW-002)	R0	R554 713	R1 917 076	R293 305	R69 055
Totals	R223 695	R7 930 267	R73 578 174	R21 022 442	R40 741 580

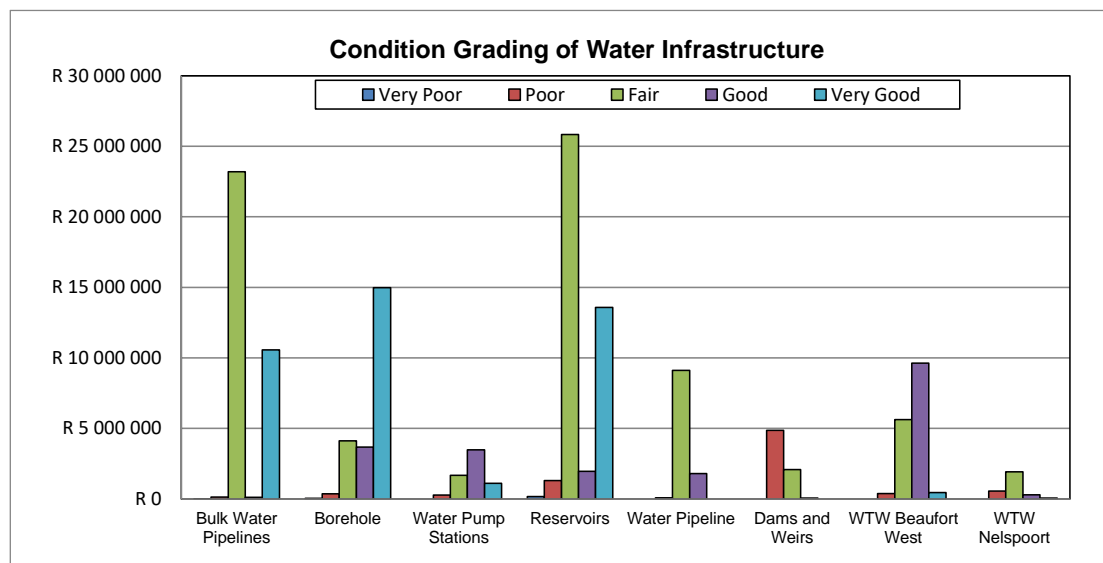


Figure A.3.4: Condition Grading of the Water Infrastructure

About 5.68% of the water supply infrastructure is in a poor or very poor condition and the condition backlog is in the order of R8.154 million. The bulk of the backlog is made up of reservoir assets.

Sewerage Infrastructure: The Opening Cost and Carrying Value of the sewerage infrastructure included in Beaufort West Municipality's current Asset Register (June 2023) is summarised in the table below.

Table A.3.9: Opening Cost and Carrying Value of the sewerage infrastructure			
Asset Type	Opening Cost	Carrying Value	% CV/OC
Sewer Reticulation Pipelines	R34 146 897	R14 750 211	43.20%
Sewer Pump Stations	R11 794 625	R4 901 249	41.55%
Beaufort West WWTW (WWTW-01)	R50 518 555	R21 240 855	42.05%
Merweville WWTW (WWTW-02)	R1 439 279	R747 378	51.93%
Murraysburg WWTW (WWTW-03)	R4 842 655	R1 697 745	35.06%
Nelspoort WWTW (WWTW-04)	R3 105 095	R1 222 603	39.37%
Totals	R105 847 106	R44 560 041	42.10%

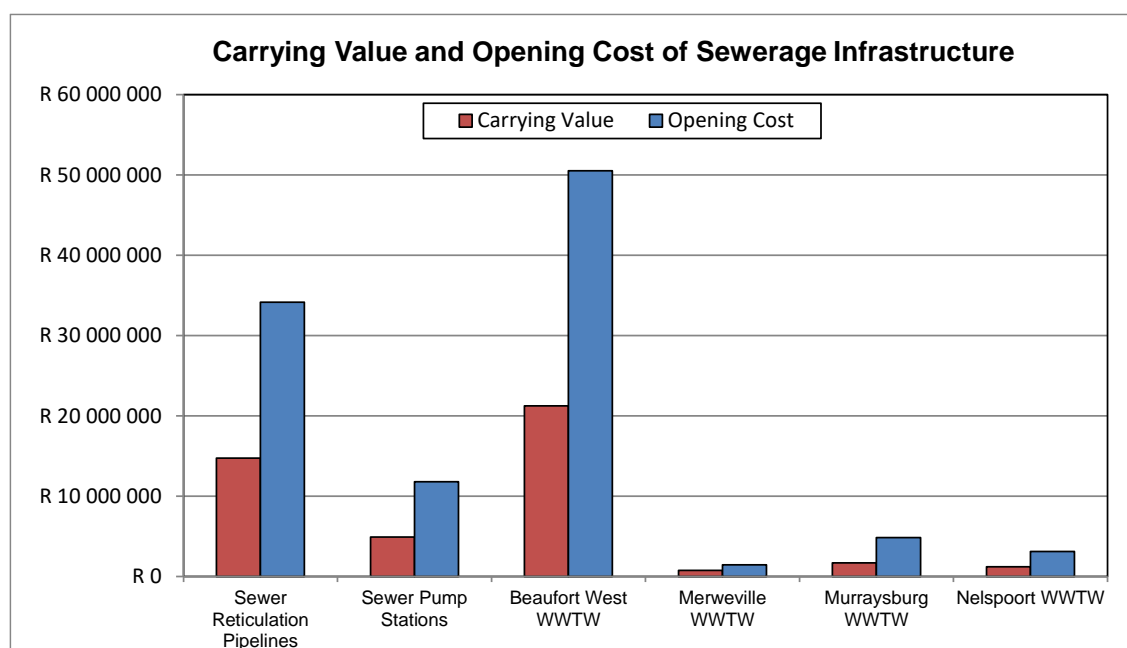


Figure A.3.5: Carrying Value and Opening Cost of the Sewerage Infrastructure

The previous table indicates that about 57.90% of the value of the sewerage infrastructure has been consumed.

The following table and graph give an overview of the RUL by facility type for the sewerage infrastructure.

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Sewer Reticulation Pipelines	R0	R0	R0	R0	R34 146 897
Sewer Pump Stations	R6 622 767	R2 913 775	R1 772	R346 925	R1 909 386
Beaufort West WWTW (WWTW-01)	R12 014 861	R2 382 331	R4 962 232	R451 939	R30 707 192
Merweville WWTW (WWTW-02)	R384 618	R232 149	R289 943	R18 175	R514 394
Murraysburg WWTW (WWTW-03)	R3 458 715	R899 520	R0	R0	R484 420
Nelspoort WWTW (WWTW-04)	R1 519 017	R414 033	R0	R0	R1 172 045
Totals	R23 999 978	R6 841 808	R5 253 947	R817 039	R68 934 334

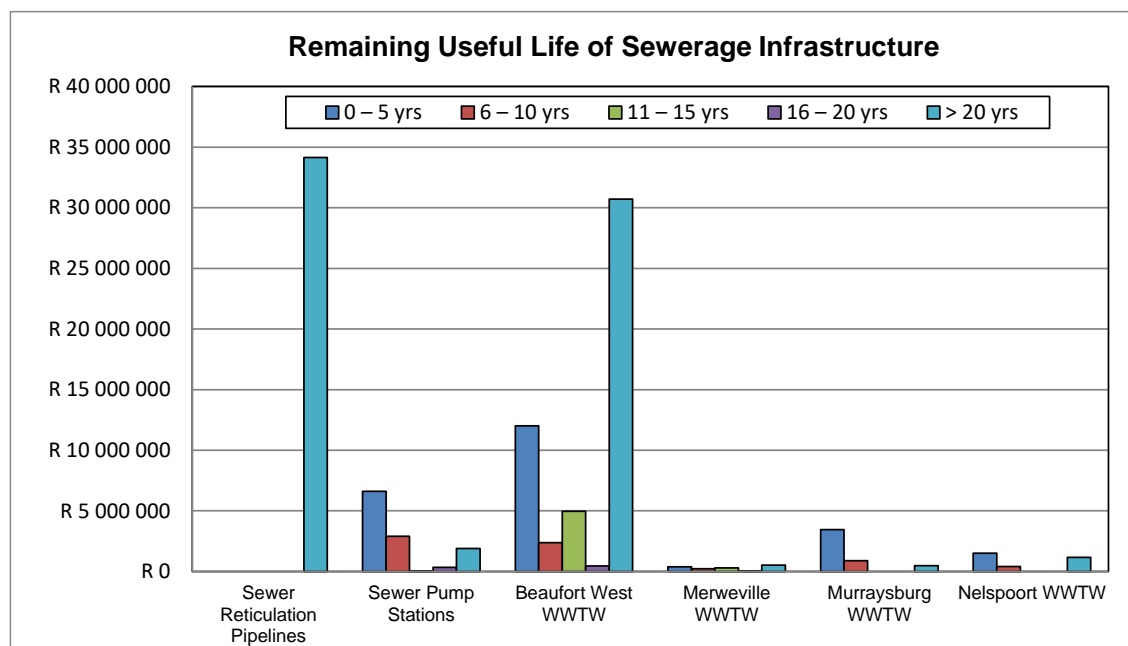


Figure A.3.6: Remaining Useful Life of the Sewerage Infrastructure

The asset renewal needs for the sewerage infrastructure assets over the next ten years is R3.084 million per year. The reinvestment required is R24.000 million in the first five years and R6.842 million in the second five-year period.

The following table and graph give an overview of the age distribution per facility for the sewerage infrastructure.

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Sewer Reticulation Pipelines	R0	R0	R0	R0	R34 146 897
Sewer Pump Stations	R486 880	R8 298 695	R636 452	R317 640	R2 054 958
Beaufort West WWTW (WWTW-01)	R1 396 535	R12 763 093	R2 599 702	R4 909 746	R28 849 479
Merweville WWTW (WWTW-02)	R0	R821 269	R0	R362 923	R255 087
Murraysburg WWTW (WWTW-03)	R1 057 683	R2 460 413	R1 000	R81 261	R1 242 298
Nelspoort WWTW (WWTW-04)	R0	R1 519 017	R0	R382 980	R1 203 098
Totals	R2 941 098	R25 862 487	R3 237 154	R6 054 550	R67 751 817

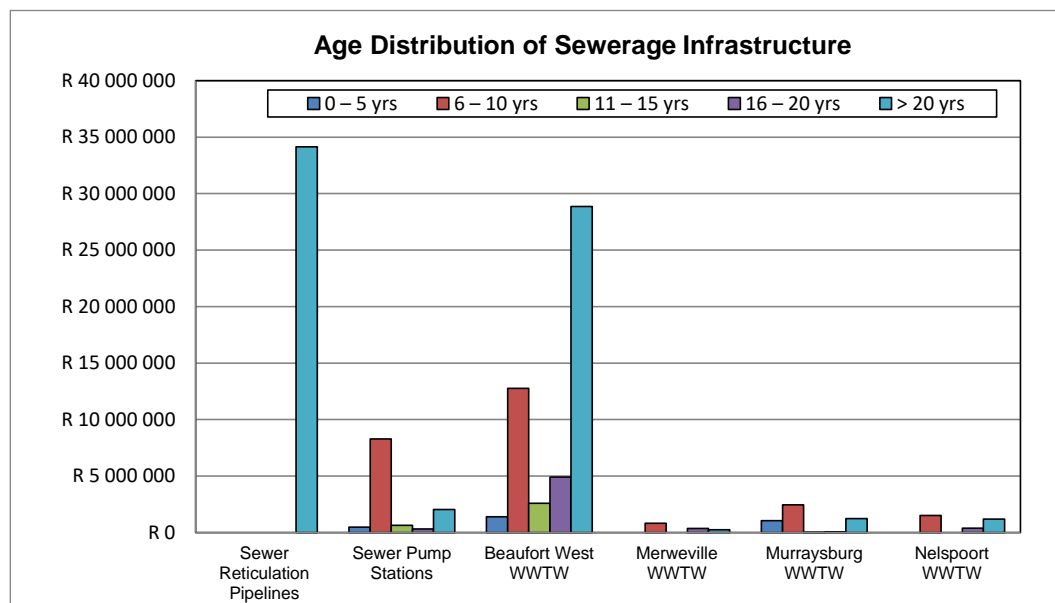


Figure A.3.7: Age Distribution of the Sewerage Infrastructure

The age of 64.01% of the sewerage infrastructure assets is greater than 20 years.

The table and graph below give an overview of the condition grading per facility for the sewerage infrastructure.

Asset Type	Very Poor	Poor	Fair	Good	Very Good
Sewer Reticulation Pipelines	R0	R0	R34 146 897	R0	R0
Sewer Pump Stations	R0	R923 781	R8 228 537	R2 642 307	R0
Beaufort West WWTW (WWTW-01)	R0	R984 933	R45 631 859	R3 595 763	R306 000
Merweville WWTW (WWTW-02)	R0	R0	R709 321	R729 958	R0
Murraysburg WWTW (WWTW-03)	R0	R840 501	R3 494 782	R507 372	R0
Nelspoort WWTW (WWTW-04)	R0	R414 033	R2 308 082	R382 980	R0
Totals	R0	R3 163 248	R94 519 478	R7 858 380	R306 000

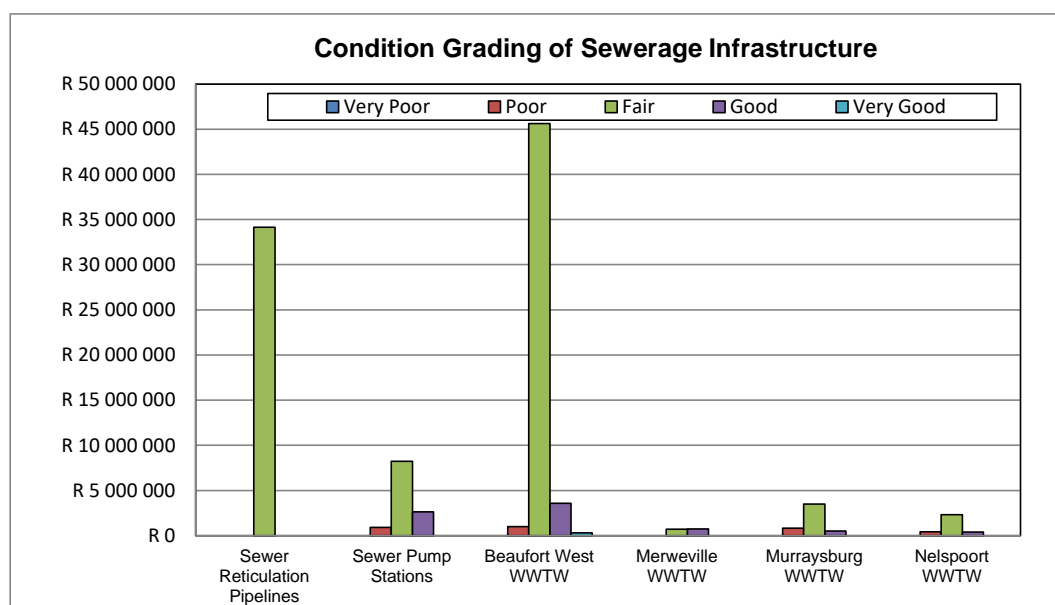


Figure A.3.8: Condition Grading of the Sewerage Infrastructure

About 2.99% of the sewerage infrastructure is in a poor or very poor condition and the condition backlog is in the order of R3.163 million. The bulk of the backlog is made up of the sewer pump stations and the WWTWs.



Disaster Management Plan: Beaufort West Municipality has an existing Risk Management Policy and Framework that enables management to proactively identify and respond appropriately to all significant risks that could impact on business objectives.

Risk Management in the municipality is guided and monitored by various committees at Council and administrative level such as the Municipal Public Accounts Committee (MPAC), Risk Committee and the Audit Committee. Additionally, the municipality appointed an Internal Auditor and a Compliance officer as part of the reasonable steps taken to maintain an effective efficient and transparent system of financial and general risk management.

Untreated Effluent Management Plan: All effluent discharged in the urban areas in Beaufort West Municipality are treated at the existing WWTWs and there is no known untreated effluent discharged to the environment. W₂RAPs were 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 addressed by Beaufort West Municipality within the specified time period. O&M is a continuous process for Beaufort West 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. Beaufort West 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, budget and other resources.

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

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	Below min. requirement	Min. requirement	Below min. requirement	Below min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement
Information	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Below min. requirement	Below min. requirement	Below min. requirement	Min. requirement
Activity Control & Management	Above min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement	Min. requirement

TOPIC 5: CONSERVATION AND DEMAND MANAGEMENT

Beaufort West Municipality will continue with the implementation of their various WC/WDM measures. The purpose of the WC/WDM Strategy, as included in the WSDP, and other WC/WDM activities are to further conserve and protect available resources and to ensure the effective utilisation of the available water resources. The average annual growth percentage in total raw water requirements for Beaufort West Municipality over the period 2013/2014 to 2023/2024 (last ten financial years) was 5.03 %/a, which is high.

The overall percentage of NRW for the 2023/2024 financial year was extremely high at 77.7% (System Input – Revenue Water) and the percentage of Water losses was 77.5% (System Input – Authorised Consumption). It is not possible to accurately calculate the NRW and Water Losses for Beaufort West Municipality, because of inaccurate billed metered consumption volumes (The financial system does not register the volume of water for accounts estimated for a specific month and the volumes for the “Cashflow” prepaid system is not recorded in the system).



Bulk water meters are in place to effectively monitor the raw water abstraction volumes and the system input volumes for all the water distribution systems. Detail IWA Water Balances are available for each of the water distribution systems (towns) in Beaufort West Municipality's Management Area. The table below gives a summary of the NRW, Water Losses and ILI for the various water distribution systems in Beaufort West Municipality's Management Area.

Table A.5.1: NRW, Water Losses and ILIs for the various water distribution systems								
Description	Component	Unit	Record: Prior (Ml/a)					23/24
			18/19	19/20	20/21	21/22	22/23	
Beaufort West	Treatment Losses	Volume	57.320	146.759	95.812	55.839	153.545	83.301
		Percentage	28.4%	17.7%	13.0%	5.2%	12.8%	5.8%
	Bulk Distribution Losses	Volume	63.508	190.539	254.805	274.408	556.818	43.343
		Percentage	3.0%	7.5%	8.6%	8.5%	16.6%	1.1%
	NRW	Volume	984.525	1 413.985	1 761.399	1 597.029	1 947.048	2 878.153
		Percentage	48.1%	60.2%	65.0%	53.7%	69.6%	77.1%
	Water Losses	Volume	980.428	1 409.286	1 755.980	1 591.085	1 941.451	2 870.688
		Percentage	47.9%	60.0%	64.8%	53.5%	69.4%	76.9%
ILI							12.35	
Merweville	Bulk Distribution Losses	Volume	4.610	Negative	Negative	18.603	14.238	1.699
		Percentage	3.9%	Negative	Negative	21.1%	19.0%	2.6%
	NRW	Volume	45.998	49.047	43.850	34.723	2.512	30.177
		Percentage	41.0%	49.1%	50.7%	49.9%	4.1%	46.5%
	Water Losses	Volume	45.773	48.847	43.677	34.584	2.391	30.047
		Percentage	40.8%	48.9%	50.5%	49.7%	3.9%	46.3%
	ILI							6.23
Nelspoort	Treatment Losses	Volume	40.116	32.549	48.873	53.555	76.749	53.916
		Percentage	25.4%	19.6%	24.2%	26.9%	34.9%	31.1%
	NRW	Volume	47.048	65.026	119.419	94.221	105.494	75.201
		Percentage	39.8%	48.7%	77.8%	64.7%	73.7%	63.1%
	Water Losses	Volume	46.812	64.759	119.112	93.930	105.208	74.963
		Percentage	39.6%	48.5%	77.6%	64.5%	73.5%	62.9%
	ILI							6.97
Murraysburg	Bulk Distribution Losses	Volume	28.150	27.876	37.501	58.260	31.085	70.849
		Percentage	10.0%	10.0%	10.0%	16.9%	9.6%	15.3%
	NRW	Volume	64.626	72.541	173.846	108.097	84.906	365.452
		Percentage	25.5%	28.9%	51.5%	37.7%	28.9%	93.4%
	Water Losses	Volume	64.120	72.039	173.171	107.523	84.317	364.669
		Percentage	25.3%	28.7%	51.3%	37.5%	28.7%	93.2%
	ILI							18.57
TOTAL	NRW	Volume	1 142.197	1 600.599	2 098.514	1 834.070	2 139.960	3 348.983
		Percentage	45.1%	56.5%	63.9%	52.8%	64.9%	77.7%
	Water Losses	Volume	1 137.133	1 594.931	2 091.940	1 827.122	2 133.367	3 340.367
		Percentage	44.9%	56.3%	63.7%	52.6%	64.7%	77.5%

Infrastructure Leakage Index (ILI) for Developed Countries = 1 – 2 Excellent (Category A), 2 – 4 Good (Category B), 4 – 8 Poor (Category C) and > 8 – Very Bad (Category D)

Category A = No specific intervention required.

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

Category C = Requires attention

Category D = Requires immediate water loss reduction interventions

The Infrastructure Leakage Index (ILI) in the previous 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.



The table below gives an overview of the System Input Volume, Average Billed Metered Consumption and Non-Revenue Water in litre per connection per day for the various water distribution systems for the 2023/2024 financial year.

Table A.5.2: System input volume, average billed metered consumption and NRW in litre per connection per day for the various water distribution systems for 2023/2024				
Water Balance Component	Beaufort West	Merweville	Nelspoort	Murraysburg
System Input Volume	972	329	798	640
Average Billed Metered Cons.	222	176	295	42
Non-Revenue Water	749	153	504	598

Beaufort West is the town with the highest system input volume and NRW per connection per day. Nelspoort is the town with the highest billed metered consumption per connection per day. Monthly statistics with regard to the number of meters installed, replaced, repaired and tested were not made available by the Municipality for the WSDP. It is important for the Municipality to keep monthly records of the work done on the water meters per system.

The table below gives an overview of the various WC/WDM measures and whether the measures are adequately addressed by Beaufort West Municipality.

Table A.5.3: Reducing NRW and Water Losses		
Reducing NRW and Water Losses		Assessment Score
Night flow metering	Partially	60%
Day flow metering	Yes	60%
Reticulation leaks	Yes	60%
Illegal connections	Partially	40%
Un-metered connections	Partially	40%
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	Yes	60%
Consumer/end-use demand management: Public Information & Education Programmes		
Schools targeted by education programmes	Not yet	0%
Consumers targeted by public information programmes	Yes	60%

DWS's scorecard for assessing the potential for WC/WDM efforts was completed for Beaufort West 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. It can be seen from the Scorecard that there are 25 questions each of which carries a maximum of 4 points providing a possible maximum score of 100. If the Municipality has the specific item completely under control, it receives the maximum points and if it is neglecting the item completely it receives no points. There are various levels between the maximum and the minimum number of points assigned to the municipality for each item depending on the level of completeness or lack thereof. **The status quo score for Beaufort West Municipality is 62 out of 100 suggesting that there is sufficient areas that can be further improved with regard to the implementation of specific WC/WDM activities.**

It is not possible to accurately calculate the NRW and Water Losses for the various water distribution systems in Beaufort West Municipality, because the Financial System does not include accurate figures for the billed metered consumption volumes. The Billed Metered Consumption volumes, as received from the Finance Department, do not include the following volumes:

- The volume of water purchased by any consumer through the "Cashflow" Prepaid system is not included in the financial system. The Municipality is busy with the phasing out of this prepaid system.
- The financial system does not register the volume of water for accounts estimated for a specific month. The water usage of 1 257 billed metered consumers (Monthly average over 12 months) were estimated for the 2023/2024 financial year. The number of billed metered consumers was 3 632 (Monthly average over 12 months) for the 2023/2024 financial year. An average of 34.6% of the billed metered consumer's demands were therefore estimated per month for the last financial year and the estimated volume of water usage for these consumers are not included in the billed metered consumption volumes.



TOPIC 6: WATER RESOURCES

Current bulk water supply to Beaufort West is from the Gamka Dam, two fountains and groundwater from a number of well fields, namely Gamka Vallei South, Steenrotsfontein, Hansrivier, Small Hansrivier, Lemoenfontein, Gamka Vallei North, Brandwacht, Springfontein, Town and Walkersdam. The well fields consist of over forty five production boreholes, but a number of these boreholes are currently not operational or were vandalised.

Beaufort West Municipality experienced serious problems with drought conditions during 2009-2011 and again in 2016-2017 impacting on the security of water supply to its consumers. The drought period has seen the water levels in the major surface water source of Beaufort West, the Gamka Dam, reduced to such low levels that the uninterrupted supply of drinking water to the town was not a certainty. The borehole scheme serves to augment the surface water, but could not supply sufficient quantities of water on its own. The lack of water in the Gamka Dam over the last few years, brought on by severe drought conditions in the catchment area of the Gamka Dam, has placed a lot of pressure on the groundwater sources which are inadequate to supply in Beaufort West's water requirements in the absence of surface water supply from the Gamka Dam. A number of the production boreholes is currently (2024) not operational or were vandalised, which resulted in a 47% reduction in safe yield of the groundwater sources for Beaufort West.

A water reclamation project, where secondary treated water from the Beaufort West WWTW is further treated (in a new reverse osmosis based treatment plant) to a high quality and mixed with the treated water from the WTW, was commissioned on the 15th of January 2011 to further supplement the existing raw water supply. The current hydraulic capacity of the reclamation plant is 1.949 Ml/d, but the plant is dependent on the volume of final treated effluent available from the WWTW.

The allocations and the safe yields of the various sources supplying Beaufort West with raw water are summarised in the table below. The impact of the non-operational and vandalized boreholes on the total safe yield can also be noticed (35% Reduction in safe yield of all resources supplying Beaufort West).

Table A.6.1: Registered and licence volumes and safe yields of the various sources supplying Beaufort West				
Source	Registered or Licence Volume (Ml/a)	Registration No. / Licence No.	Safe Yield (Ml/a) (All operational)	Safe Yield (Ml/a) (Status Quo)
Gamka Dam	500.000	22060065	373.000	373.000
Reclamation Plant	711.385	-	711.385	711.385
Brandwacht	347.862	22060617	568.699	526.651
Springfontein	39.178	22060519	485.654	327.974
Lemoenfontein	156.660	22059656	157.680	157.680
Gamka Vallei North	263.658	22060458	553.930	427.786
Gamka Vallei South & Town *	684.639	22060555	445.081	295.285
Walkersdam Borehole	72.675	22060537	72.533	0.000
Hansrivier	798.912	16/J21A/A/2225	734.789	104.069
Small Hansrivier			364.241	63.072
Steenrotsfontein	294.336	16/J21A/A/2849	484.708	239.674
Totals	3 869.305		4 951.700	3 226.576

Notes: See table 6.2.2.1 for the safe yields of the individual boreholes.

* Include Garcia Street Fountain

The WULA volumes and the safe yields of the boreholes supplying Merweville with raw water are summarised in the table below.

Table A.6.2: WULA volumes and safe yields of the various boreholes supplying Merweville				
Borehole No.	2022 WULA Volume (Ml/a)	Safe Yield (Ml/a) (All operational)	Safe Yield (Ml/a) (Status Quo)	Comment
ME2	-	-	-	Borehole not in use anymore
ME3	-	-	-	Borehole not in use anymore
ME4	12.614	12.614	12.614	Production borehole, part of WULA
ME6	22.075	22.075	22.075	Production borehole, part of WULA
ME7	9.461	9.461	9.461	Production borehole, part of WULA
ME8	-	-	-	Borehole not in use anymore
ME9	7.884	7.884	7.884	Production borehole, part of WULA
MV2	19.868	19.868	19.868	Production borehole, part of WULA



Table A.6.2: WULA volumes and safe yields of the various boreholes supplying Merweville				
Borehole No.	2022 WULA Volume (Ml/a)	Safe Yield (Ml/a) (All operational)	Safe Yield (Ml/a) (Status Quo)	Comment
MV3	18.922	18.922	18.922	Production borehole, part of WULA
MV4	12.614	12.614	12.614	Production borehole, part of WULA
MV5	28.382	28.382	28.382	Production borehole, part of WULA
MV6	25.229	25.229	25.229	Production borehole, part of WULA
Total	157.049	157.049	157.049	

Bulk water supply to Nelspoort is from groundwater from three production boreholes and surface water from the Sout River. The registered volumes and the safe yields of the sources supplying Nelspoort with raw water are summarised in the table below.

Table A.6.3: Registered volumes and safe yields of the various sources supplying Nelspoort				
Source	Registration (Ml/a)	Registration No.	Safe Yield (Ml/a) (All operational)	Safe Yield (Ml/a) (Status Quo)
Sout River	98.926	22023971	98.926	98.926
Borehole No.1	Not registered	Not registered	53.611	53.611
Borehole No. 2	Not registered	Not registered	100.915	100.915
Borehole No. 3	Not registered	Not registered	124.042	124.042
Total	98.926		377.494	377.494

Bulk water supply to Murraysburg is from four production boreholes. The WULA volumes and the safe yields of the boreholes supplying Murraysburg with raw water are summarised in the table below.

Table A.6.4: WULA volumes and safe yields of the various boreholes supplying Murraysburg				
Borehole No.	2023 WULA Volume (Ml/a)	Safe Yield (Ml/a) (All operational)	Safe Yield (Ml/a) (Status Quo)	Comment
Hostel	-	-	-	Borehole not in use anymore
Park No.1	-	-	-	Borehole not in use anymore
Park No.2	-	-	-	Borehole not in use anymore
Victoria West	179.755	179.755	179.755	Production borehole, part of WULA
Rugby Field	157.680	157.680	157.680	Production borehole, part of WULA
Riverside	134.028	134.028	134.028	Production borehole, part of WULA
Moddergat	210.240	210.240	210.240	Production borehole, part of WULA
Steenwerke BH No.1	26.280	26.280	-	Future production borehole, part of WULA
Steenwerke BH No.2	3.942	3.942	-	Future production borehole, part of WULA
Steenwerke BH No.3	7.884	7.884	-	Future production borehole, part of WULA
Total	719.809	719.809	681.703	

The table below gives an overview of the current water resources, the current volumes abstracted and the authorised volumes.

Table A.6.5: Current water resources and volumes							
Source Type	Scheme	Number of Sources	Current 23/24 System Input Volumes or Returns (Mm³/a)	Licensed Abstraction / Returns (Mm³/a)	Community water supply		Assessment Score
					Rural	Urban	
Groundwater	Beaufort West	27 (Operational)	2.112	2.658	0%	100%	60%
	Merweville	9	0.067	WULA was submitted	0%	100%	80%
	Nelspoort	3	0.103	Unknown	0%	100%	80%
	Murraysburg	4	0.462	WULA was submitted	0%	100%	80%
Surface Water	Beaufort West	4	1.038	0.500	0%	100%	60%
	Nelspoort	1	0.070	0.099	0%	100%	80%
Reclamation Plant	Beaufort West	1	0.427	0.711 (To be confirmed)	0%	100%	80%
External Sources	Not Applicable						
Water returned to source	Beaufort West	1	0.362	1.871	-	-	80%
	Murraysburg	1	Unknown	Unknown	-	-	60%

The table below indicates the potential additional future water resources for Beaufort West Municipality.

Table A.6.6: Additional water resources and volumes				
Source Type	Schemes	Number of Sources	Potential Volume (Mm ³ /a)	Licensed Abstraction (Mm ³ /a)
Groundwater	Beaufort West *	19	1.812	Unknown
	Merweville	-	-	-
	Nelspoort	-	-	-
	Murraysburg	3	0.038	In Process
Surface Water	Beaufort West	-	-	-
	Nelspoort	-	-	-
External Sources	Not Applicable			

Note: * Current non-operational and vandalised boreholes.

Abstraction from all water resources are metered and readings are recorded by Beaufort West Municipality for all four their systems.

Table A.6.7: Monitoring		
Monitoring	Assessment Score	
% of water abstracted monitored: Surface water	80%	
% of water abstracted monitored: Ground water	80%	
Monitoring	Interval	Assessment Score
Surface water levels (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Weekly	60%
Ground water levels (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Monthly	60%
Water quality for formal schemes? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Monthly	80%
Water quality for rudimentary schemes? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	As requested (CK DM)	60%
Borehole abstraction? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Monthly	80%

The graph below gives an overview of the average daily bulk raw water volume for all four systems combined. The impact of the droughts experienced over the period 2016 and 2017 can be noted on the graph.

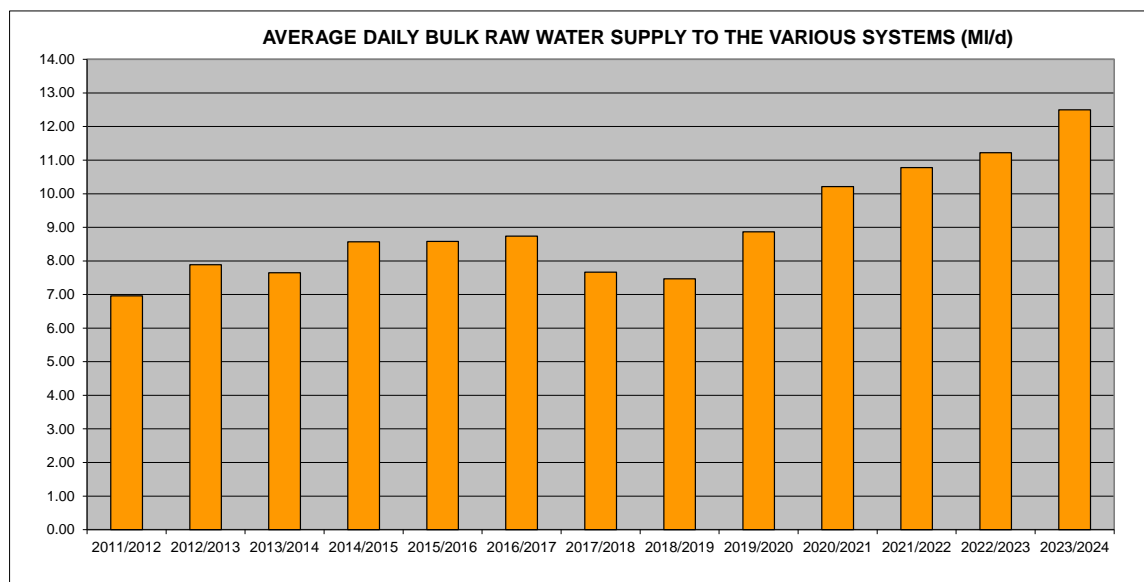


Figure A.6.1: Beaufort West Municipality's Average Daily Bulk Raw Water Volume for all four Systems



The graph below gives an overview of the historical bulk raw water supply volume for the towns in Beaufort West Municipality's Management Area (M/a).

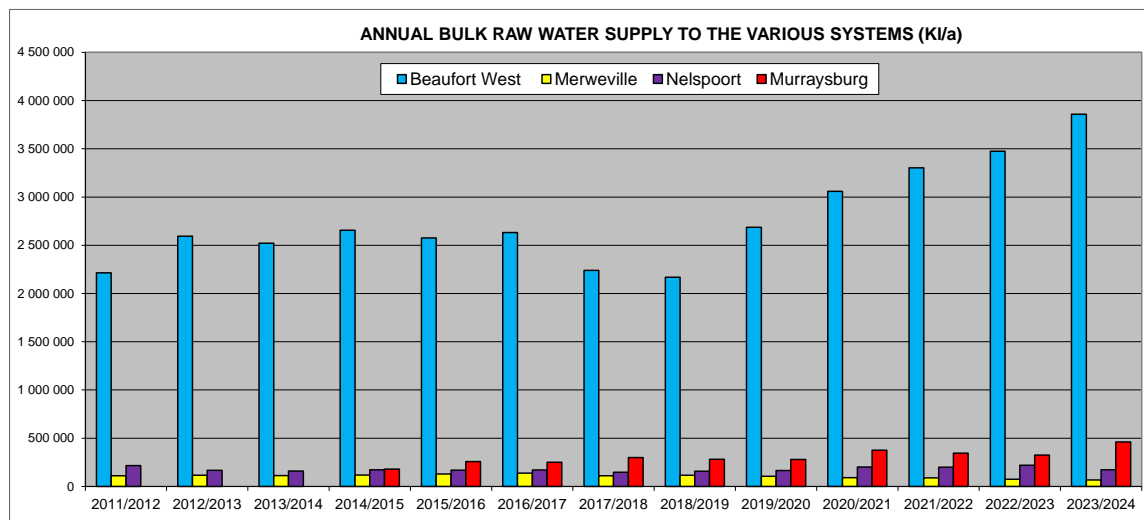


Figure A.6.2: Annual Bulk Raw Water Supply Volume per System

The table below gives an overview of the safe yields and the historical raw water abstraction volumes for the last six financial years for the four systems.

Table A.6.8: Volume of raw water abstracted							
Scheme	Safe Yields (Ml/a)	Record : Prior (Ml/a)					2023/2024
		2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	
Beaufort West	3 226.576 (Status Quo)	2 169.414	2 686.972	3 059.994	3 302.416	3 475.903	3 859.034
	4 951.700 (All BHs operational)						
Merweville	157.049	116.873	105.148	91.000	88.229	74.867	66.660
Nelspoort	377.494	158.206	165.969	202.313	199.175	219.985	173.106
Murraysburg	681.703 *	281.498	278.755	375.013	344.848	325.375	461.992
Total		2 725.991	3 236.844	3 728.320	3 934.668	4 096.130	4 560.792

Note: * Exclude available yield from three Steenwerke boreholes.

Water Quality: Beaufort West Municipality monitors the water quality in the distribution networks of all the towns within their Municipal Management Area. The Drinking Water Quality Sampling Programme is actively implemented in order to promptly identify water quality failures and to react accordingly. 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.

The table below gives an overview of the various water quality monitoring measures and whether it is in place for Beaufort West Municipality.

Table A.6.9: Water Quality			
Water Quality	In place	Status Quo	Assessment Score
Is there a Water Safety Plan in Place?	Yes	40%	40%
Reporting on quality of water taken from source: urban & rural	Yes	60%	60%
Quality of water returned to the resource: urban	Yes	40%	40%
Quality of water returned to the resource: rural	No	Not Applicable	80%
Is there a Pollution contingency measures plan in place?	Yes	40%	40%
Quality of water taken from source: urban - % monitored by WSA self?	Yes	60%	60%
Quality of water taken from source: rural - % monitored by WSA self?	No	Not Applicable	80%
Quality of water returned to the source: urban - % monitored by WSA self?	Yes	40%	40%
Quality of water returned to the source: rural - % monitored by WSA self?	No	Not Applicable	80%
Are these results available in electronic format? (Yes/no)	Yes	80%	80%



Table A.6.9: Water Quality			
Water Quality	In place	Status Quo	Assessment Score
% Time (days) within SANS 241 standards per year	Yes	80%	80%
Abstraction IS registered with DWS	Yes	60%	60%
The abstraction IS NOT registered with DWS	-	-	-
The abstraction IS recorded	Yes	80%	80%
The abstraction IS NOT recorded	-	-	-

Note: The score of 80% in the above table is Excellent, which is the highest score in DWS's eWSDP website.

The current Operational and Compliance Water Quality Sampling Programmes of Beaufort West Municipality are not adequate. The current number of monthly microbiological samples taken for each of the systems is adequate and no additional microbiological samples need to be taken by Beaufort West Municipality. The additional monitoring required by Beaufort West Municipality for determinands identified during the Blue Drop risk assessment exceeding the SANS241:2015 limits for the 2023/2024 financial year, were as follows (Frequency of analysis for determinands identified during the risk assessment exceeding the numerical limits in SANS241-1).

- Nelspoort: Aesthetic (Quarterly) and Operational Efficiency (Monthly) were unacceptable.
- Murraysburg: Acute Health Chemical (Monthly), Acute Health Microbiological (Monthly) and Aesthetic (Quarterly) were unacceptable.

The overall percentage of compliance of the water quality samples taken over the last two financial years are summarised in the table below per distribution system (SANS 241: 2015 Limits).

Table A.6.10: Percentage compliance of the water quality samples for the last two financial years per performance indicator						
Performance Indicator	Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2015)		% Sample Compliance according to SANS 241-2015 Limits		Number of Samples taken into account	
	23/24	22/23	23/24	22/23	23/24	22/23
Beaufort West						
Acute Health Chemical	No (Excellent)	-	100.0%	-	16	-
Acute Health Microbiological	No (Excellent)	No (Good)	100.0%	96.6%	144	146
Chronic Health	No (Excellent)	-	99.4%	-	310	-
Aesthetic	No (Excellent)	-	97.3%	-	558	-
Operational Efficiency	No (Excellent)	No (Good)	93.0%	92.9%	546	154
Beaufort West Reclamation Plant						
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	60	29
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	100.0%	48	27
Chronic Health	No (Excellent)	No (Excellent)	100.0%	99.4%	213	163
Aesthetic	No (Excellent)	No (Excellent)	100.0%	100.0%	132	99
Operational Efficiency	No (Excellent)	No (Excellent)	100.0%	97.2%	48	36
Merweville						
Acute Health Chemical	No (Excellent)	-	100.0%	-	11	-
Acute Health Microbiological	No (Excellent)	No (Good)	100.0%	95.2%	24	21
Chronic Health	No (Excellent)	-	100.0%	-	63	-
Aesthetic	No (Excellent)	-	100.0%	-	98	-
Operational Efficiency	No (Excellent)	Yes (Unacceptable)	93.1%	74.1%	87	27
Nelspoort						
Acute Health Chemical	No (Excellent)	-	100.0%	-	5	-
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	100.0%	24	22
Chronic Health	No (Excellent)	-	97.0%	-	67	-
Aesthetic	Yes (Unacceptable)	-	72.0%	-	100	-
Operational Efficiency	Yes (Unacceptable)	No (Good)	87.1%	92.3%	93	26
Murraysburg						
Acute Health Chemical	Yes (Unacceptable)	-	60.0%	-	5	-
Acute Health Microbiological	Yes (Unacceptable)	No (Excellent)	81.8%	100.0%	22	19
Chronic Health	No (Excellent)	-	100.0%	-	59	-



Table A.6.10: Percentage compliance of the water quality samples for the last two financial years per performance indicator						
Performance Indicator	Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2015)		% Sample Compliance according to SANS 241-2015 Limits		Number of Samples taken into account	
	23/24	22/23	23/24	22/23	23/24	22/23
Aesthetic	Yes (Unacceptable)	-	77.3%	-	88	-
Operational Efficiency	No (Good)	Yes (Unacceptable)	92.8%	70.4%	83	27

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.6.11: 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	Determinand that poses an immediate unacceptable health risk if present at concentration values exceeding the numerical limits specified in this part of SANS 241.
Aesthetic	Determinand that taints water with respect to taste, odour and colour and that does not pose an unacceptable health risk if present at concentration values exceeding the numerical limits specified in SANS 241.
Chronic Health	Determinand that poses an unacceptable health risk if ingested over an extended period if present at concentration values exceeding the numerical limits specified in SANS 241.
Operational	Determinand that is essential for assessing the efficient operation of treatment systems and risks from infrastructure

The table below indicates the compliance of the E.Coli monitoring frequency in the water distribution systems of Beaufort West Municipality, in terms of the minimum requirements of SANS:241-2: 2015 (Table 2). The period assessed was for samples taken from July 2023 to June 2024.

Table A.6.12 Beaufort West Municipality's compliance of the monthly E.Coli monitoring frequency for the water distribution systems and at the WTWs 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)	Average Number of monthly E.Coli samples taken by Municipality during 2023/2024
Beaufort West	40 753	8.2	12.0
Merweville	1 903	2.0	2.0
Nelspoort	1 914	2.0	2.0
Murraysburg	6 061	2.0	1.8
Total	50 631	14.2	17.8

It can be noted from the above table that the number of monthly E.Coli samples taken by the Municipality during the 2023/2024 financial year was more than the required number of samples for all the water distribution systems, except for Murraysburg, where two more samples were required to ensure compliance.

Effluent Quality: The overall Microbiological compliance percentages of the final effluent samples taken during the last financial year at the Beaufort West and Murraysburg WWTWs are summarised in the table below.

Table A.6.13: Percentage Microbiological (Faecal Coliforms) compliance of the compliance samples taken at the Beaufort West and Murraysburg WWTWs for the last financial year	
WWTW	2023/2024
Beaufort West	80.0%
Murraysburg	100.0%
Overall Compliance %	89.5%



No Chemical (Ammonia, Nitrates & Nitrites, COD Ortho-Phosphates) and Physical (pH, EC, TSS) compliance samples were taken at the Beaufort West and Murraysburg WWTWs. The percentage wastewater quality compliance for the various WWTWs, as included in DWS's 2022 Green Drop Report and 2023 Green Drop Progress Report, were as follows.

Table A.6.14: Microbiological, Chemical, Physical and Overall compliance percentages, as included in DWS's 2022 Green Drop Report and 2023 Green Drop Progress Report.						
WWTW	2022 Green Drop Report			2023 Green Drop Progress Report (July 2021 – June 2022 data)		
	Microbiological	Chemical	Physical	Microbiological	Chemical	Physical
Beaufort West	92.0%	84.0%	56.0%	40.0%	92.1%	54.3%
Merweville	NMR	NMR	NMR	0.0%	NMR	0.0%
Nelspoort	NMR	NMR	NMR	0.0%	0.0%	0.0%
Murraysburg	No monitoring	No monitoring	No monitoring	0.0%	0.0%	0.0%

TOPIC 7: FINANCIAL

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

Table A.7.1: Historical Capital expenditure of the water and sewerage infrastructure budgets		
Financial Year	Water Infrastructure	Sewerage Infrastructure
	Expenditure	Expenditure
2020/2021	R11 575 249	R306 001
2021/2022	R4 094 990	R0
2022/2023	R25 822 746	R0

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

Table A.7.2: Summary of Operational and Maintenance expenditure and income budgets for water and sanitation services					
Description	Record Prior (R)				2022/2023
	2018/2019	2019/2020	2020/2022	2021/2022	
Water Services					
Expenditure	R23 225 000	R29 112 000	R23 476 000	R33 642 000	R28 138 000
Income	R34 992 000	R37 300 000	R50 513 000	R31 002 000	R45 680 000
Surplus / Deficit	R11 767 000	R8 188 000	R27 037 000	R2 640 000	R17 542 000
Sanitation Services					
Expenditure	R10 656 000	R19 130 000	R5 498 000	R13 633 000	R20 680 000
Income	R20 920 000	R23 328 000	R18 863 000	R26 157 000	R28 696 000
Surplus / Deficit	R10 264 000	R4 198 000	R13 365 000	R12 524 000	R 8 016 000

Tariff and Charges: The first six (6) kl of water is provided free to all indigent residential consumers. Beaufort West Municipality's current (2023/2024) water and sewerage tariffs are based on the following:

- A five block step rising residential water tariff structure with the first 6 kl/month being free for all indigent registered households (Subsidised). Residential consumers also pay a fix water network charge per month.
- Business, Commercial, Industrial, Schools, Government Institutions, Sport Clubs and the Municipality pay a fix water network charge and a fix tariff per kl water usage.
- Residential sewerage charges are fix charges for a year, irrespective of the number of toilets.
- The sewage tariffs for Businesses, Offices and other Institutions are fix charges for a year.
- Fixed sewage tariffs are also in place for the emptying of septic or conservancy tank.



Historically, water use in the highest tariff block provided a mechanism to subsidize lower-usage and indigent customers. However, after the drought, consumption in the highest block is greatly reduced. Thus, cross subsidization now hardly benefits low usage and indigent customers. The current tariff structure is largely based on volume of water consumed, meaning exogenous factors can control water revenues. Examples are climate change, industrial efficiency gains, domestic plumbing improvements, etc. that all reduce water consumed and revenues. The costs residential consumers had to pay for their water in Beaufort West Municipality's Management Area, for the various financial years, are presented on the graph below.

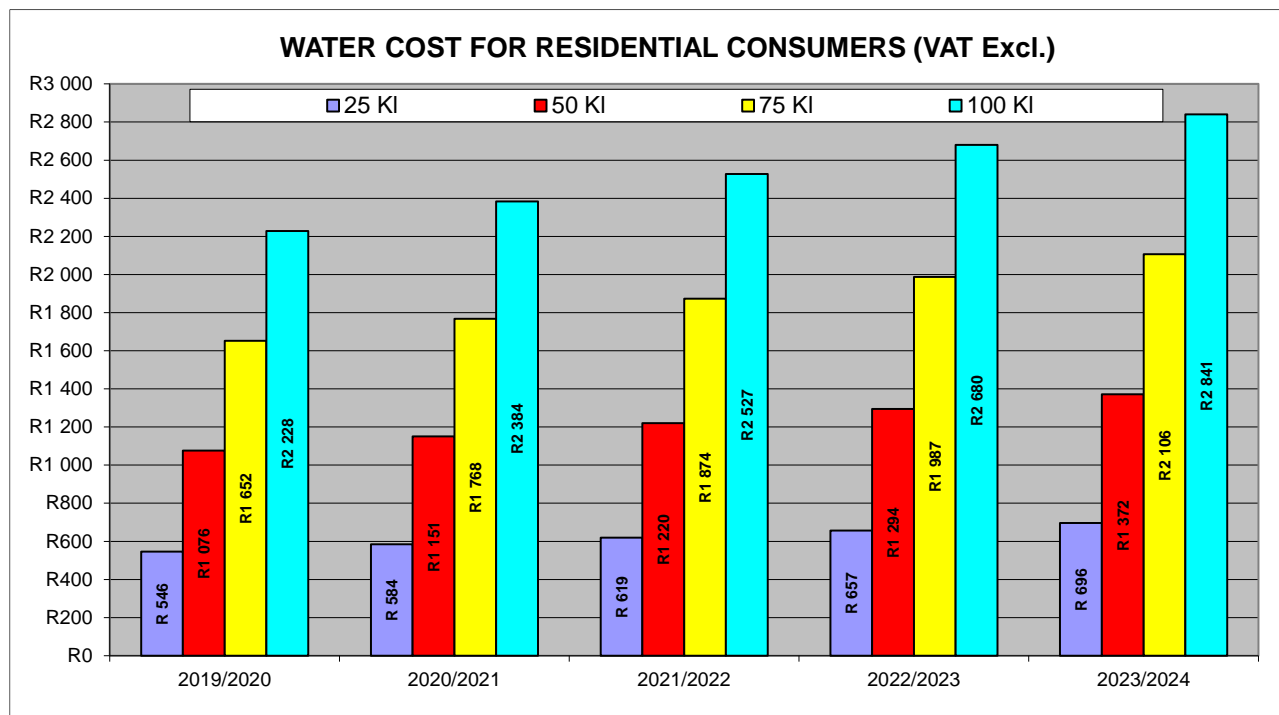


Figure A.7.1: Water Cost for Residential Consumers

The water tariff structures for Beaufort West Municipality for the 2023/2024 financial year and the previous four financial years are summarised in the table below (Subject to VAT).

Table A.7.3: Water tariffs for 2023/2024 and the previous four financial years						
Consumer/Description	Category	19/20	20/21	21/22	22/23	23/24
Beaufort West Sub-economic Dwellings	Availability Fees per month	R92-88	R99-38	R99-38	R105-34	R111-66
Beaufort West Other Residential and Industrial Consumers	Availability Fees per month	R152-19	R162-84	R172-61	R182-97	R193-95
Beaufort West No meter, only standing tap for the use of more than one erf	Availability Fees per month	R65-16	R69-72	R73-90	R78-33	R83-03
Beaufort West Credit Meters (No Restrictions)	Tariff 1 (0 – 6 KI)	R13-38	R14-32	R15-18	R16-09	R17-06
	Tariff 2 (7 – 15 KI)	R15-36	R16-44	R17-43	R18-48	R19-59
	Tariff 3 (16 – 25 KI)	R17-53	R18-76	R19-89	R21-08	R22-34
	Tariff 4 (26 – 35 KI)	R18-43	R19-72	R20-90	R22-18	R23-51
	Tariff 5 (>36 KI)	R23-04	R24-65	R26-13	R27-72	R29-38
Beaufort West Business Water	Per KI	R17-53	R18-76	R19-89	R21-08	R22-34
Beaufort West Prepaid Meter Water Consumption Rates	Tariff 1 (0 – 6 KI)	R21-19	R22-67	R24-03	R25-47	R27-00
	Tariff 2 (7 – 15 KI)	R22-95	R24-56	R26-03	R27-59	R29-25
	Tariff 3 (16 – 25 KI)	R17-53	R18-76	R26-03	R27-59	R29-25
	Tariff 4 (26 – 35 KI)	R18-44	R19-73	R26-03	R27-59	R29-25
	Tariff 5 (>36 KI)	R23-04	R24-65	R26-03	R27-59	R29-25
Merweville Basic Charge	Fees per month	R24-61	R26-33	R27-91	R29-58	R31-35
Merweville Credit Meters	Tariff 1 (0 – 6 KI)	R7-17	R7-67	R8-13	R8-62	R9-14



Table A.7.3: Water tariffs for 2023/2024 and the previous four financial years						
Consumer/Description	Category	19/20	20/21	21/22	22/23	23/24
(No Restrictions)	Tariff 2 (7 – 15 Kl)	R7-89	R8-44	R8-95	R9-49	R10-06
	Tariff 3 (16 – 25 Kl)	R8-61	R9-21	R10-74	R11-39	R12-07
	Tariff 4 (26 – 35 Kl)	R10-26	R10-98	R11-64	R12-34	R13-08
	Tariff 5 (>36 Kl)	R11-05	R11-82	R12-53	R13-28	R14-08
Merweville Business Water	Per Kl	R8-61	R9-21	R9-76	R10-35	R11-00
Merweville Prepaid Meter Water Consumption Rates	Tariff 1 (0 – 6 Kl)	R11-24	R12-03	R12-75	R13-52	R14-33
	Tariff 2 (7 – 15 Kl)	R11-24	R12-03	R14-50	R15-37	R16-30
	Tariff 3 (16 – 25 Kl)	R13-49	R14-43	R17-40	R18-44	R19-55
	Tariff 4 (26 – 35 Kl)	R14-62	R15-64	R18-85	R19-98	R21-20
	Tariff 5 (>36 Kl)	R15-74	R16-84	R20-30	R21-52	R22-81
Nelspoort Basic Charge	Fees per month	R84-16	R90-05	R95-45	R101-18	R107-25
Nelspoort Credit Meters (No Restrictions)	Tariff 1 (0 – 6 Kl)	R7-48	R8-00	R8-48	R8-99	R9-53
	Tariff 2 (7 – 15 Kl)	R8-46	R9-05	R9-59	R10-17	R10-78
	Tariff 3 (16 – 25 Kl)	R9-26	R9-91	R10-51	R11-14	R11-81
	Tariff 4 (26 – 35 Kl)	R10-12	R10-83	R11-48	R12-17	R12-90
	Tariff 5 (>36 Kl)	R11-00	R11-77	R12-48	R13-23	R14-02
Hospital	Tariff 3	R8-46	R9-05	R10-51	R11-14	R11-81
Other Consumers	Fixed Rate	R93-90	R100-47	R106-50	R112-89	R119-66
Nelspoort Prepaid Meter Water Consumption Rates	Tariff 1 (0 – 6 Kl)	R11-71	R12-53	R13-28	R14-08	R14-92
	Tariff 2 (7 – 15 Kl)	R13-42	R14-36	R15-22	R16-13	R17-10
	Tariff 3 (16 – 25 Kl)	R17-53	R18-76	R19-89	R21-08	R22-34
	Tariff 4 (26 – 35 Kl)	R18-44	R19-73	R18-26	R19-36	R20-52
	Tariff 5 (>36 Kl)	R23-04	R24-65	R22-83	R24-20	R25-65
Murraysburg Basic Charge	Fees per month	R40-95	R43-82	R46-45	R49-24	R52-19
Murraysburg Consumption	Per Kl	R4-85	R5-19	R5-50	R5-83	R6-18
Murraysburg Prepaid meters	Per Kl	R7-90	R8-45	R8-96	R9-50	R10-07
Murraysburg: Deposit Credit Meters	Once off	R80-25	R85-87	R91-02	R96-48	R102-27
Murraysburg: Re-connections	Once off (Vat incl.)	R41-90	R44-83	R47-52	R50-37	R53-39
Murraysburg: New Water Connection	Once off	Actual cost + 10%				
Murraysburg Irrigation Water	Township per/hr or part thereof	R44-75	R47-88	R50-75	R53-80	R57-03
	Arable land per/hr overflow water	R4-60	R4-92	R5-22	R5-53	R5-86
	Bowls Club per/hr or part thereof	R39-35	R42-10	R44-63	R47-31	R50-15

The sewage tariff structures for Beaufort West Municipality for the 2023/2024 financial year and the previous four financial years are summarised in the table below (Subject to VAT).

Table A.7.4: Sewage tariffs for 2023/2024 and the previous four financial years						
Consumer/Description	Category	19/20	20/21	21/22	22/23	23/24
All private dwellings, economic dwellings, schools, residences, old age homes, Municipal buildings (excluding sub-economic dwellings) flats, link houses, Pathfinders, halls, churches, sports clubs and agricultural show grounds.	Per year	R1 387-40	R1 484-52	R1 573-60	R1 668-00	R1 768-08
Sub-economic housing	Per year	R383-30	R410-13	R434-70	R461-00	R517-98
Merweville	Per year	R1 170-40	R1 252-33	R1 327-50	R1 407-00	R1 580-91
Nelspoort	Per year	R587-45	R628-57	R666-30	R706-30	R792-54



Table A.7.4: Sewage tariffs for 2023/2024 and the previous four financial years						
Consumer/Description	Category	19/20	20/21	21/22	22/23	23/24
Businesses, offices, and any other institution not specifically mentioned elsewhere:	Per year	R1 785-00	R1 909-95	R1 909-95	R2 146-00	R2 411-25
Built-up or undeveloped erven that is not connected to the Municipal sewerage network system.	Per year	Sanitary fee, equal to the ordinary sewerage fee				
Merweville: Built-up or undeveloped erven that is not connected to the Municipal sewerage network system	Per year	R170-00	R181-90	R192-80	204-40	R216-66
Test Fees	Per inspection	R111-00 + R90-00 for each additional inspection	R119-00 + R96-00 for each additional inspection	R126-00 + R102-00 for each additional inspection	R134-00 + R108-00 for each additional inspection	R142-04 + R114-48 for each additional inspection
Deduction of storage tanks, per load	For pumping storage tanks in Industrial Area that can connect to Sewage system.	R252-50	R270-00	R286-00	R303-00	R321-18
	For pumping of storage tanks in Industrial Area that can connect to Sewage system	R450-00	R482-00	R511-00	R542-00	R574-52
	For pumping storage tanks on Saturdays, Sundays, Public Holidays and after office hours	R900-00	R963-00	R1 021-00	R1 082-00	R1 146-92
Merweville: Deduction of storage tanks, per load	For pumping storage tanks on Monday to Friday	R172-00	R184-00	R195-00	R207-00	R219-42
	For pumping storage tanks on Saturdays, Sundays, Public Holidays and after office hours	R343-00	R367-00	R389-00	R412-00	R436-72
Maintenance: Repair of toilets	Toilet pan	R843-00	R902-00	R956-00	R1 013-00	R1 073-78
	Toilet sink with float valve	R343-00	R367-00	R389-00	R412-00	R436-72
	Float valve	R111-00	R119-00	R126-00	R134-00	R142-04
	Double folding seat	R123-00	R132-00	R140-00	R148-00	R156-88
Empty pump of sewerage tanks outside the proclaimed area	Truck	The rate applies per hour Plus the tariff applicable within the Township				
	Plus	Administrative costs according to the percentage as from time to time determined by Council.				
Sewerage: Size Services	A contribution to major tailoring services must be paid by the developers	R2 687-00	R2 875-00	R3 048-00	R3 231-00	R3 424-86
Murraysburg Sewerage	Basic per/month	R56-20	R60-13	R63-74	R67-56	R71-61
	Sucking: per load	R56-20	R60-13	R63-74	R67-56	R71-61
	Sucking: after hours, per load	R112-35	R120-21	R127-42	R135-07	R143-17
	Bucket system per month (one removal per week)	R45-80	R49-01	R51-95	R55-07	R58-37
	Hostel: Split heads / household (per month)	R56-20	R60-13	R63-74	R67-56	R71-61
	Schools per toilet per month	R89-30	R95-55	R101-28	R107-36	R113-80
	Sewerage Blockages (Vat Incl.)	R62-80	R67-20	R71-23	R75-50	R80-03
	New sewerage connections	Actual cost + 10% (admin)				

TOPIC 8: WATER SERVICES INSTITUTIONAL ARRANGEMENTS AND CUSTOMER SERVICES

Beaufort West Municipality is the WSA and Water Services Provider for the various towns in Beaufort West Municipality's Management Area.

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.

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

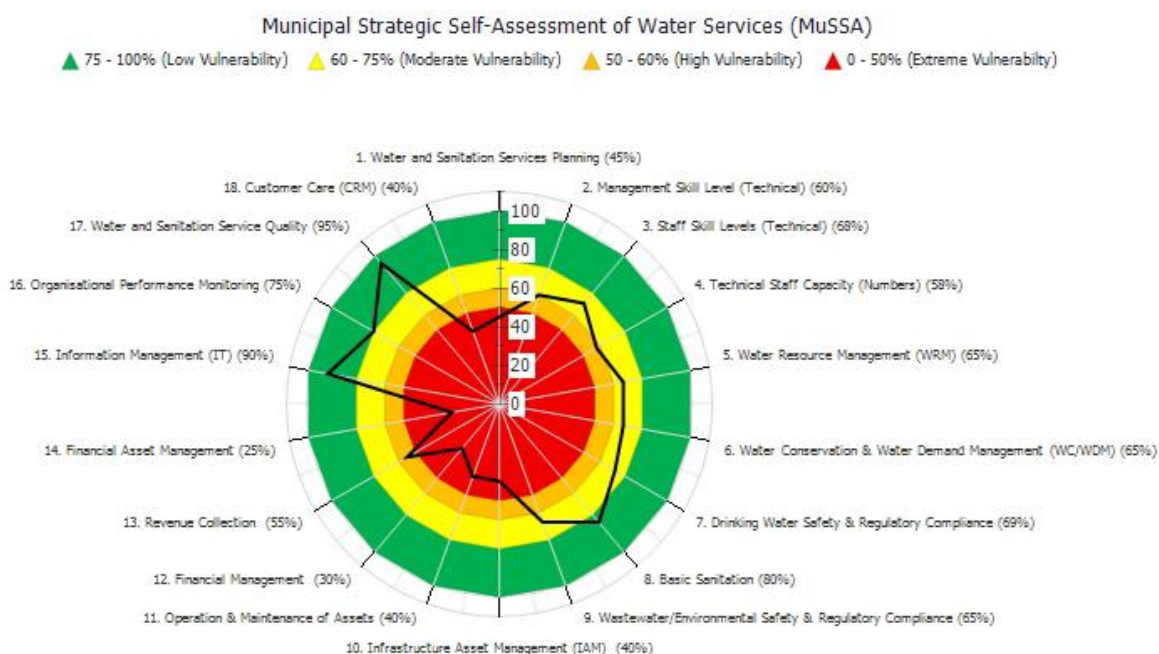


Figure A.8.1: Spider Diagram of the Vulnerability Levels of Beaufort West Municipality for 2023

Beaufort West Municipality's Vulnerability Index for 2023 was indicated as 0.72 "High Vulnerability". The areas of concern evident from the 2023 assessment are Water and Sanitation Services Planning (45.0%), Infrastructure Asset Management (IAM) (40.0%), Operation & Maintenance of Assets (40.0%), Financial Management (30.0%), Revenue Collection (55.0%), Financial Asset Management (25.0%), Customer Care (CRM) (40.0%) and Technical Staff Capacity (Numbers) (58.0%).



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

Beaufort West Municipality also received their 2023 No Drop Score, as calculated through the 2023 Assessment done by the DWS. The 2023 No Drop assessments were performed using a reduced set of No Drop Criteria. These criteria were selected to assess a WSA's understanding of their WC/WDM status, the plans, strategies, budgets, and implementation of remedial projects. Below is a brief description of the Criteria used for the 2023 assessment.

Table A.8.1: Description of No Drop Criteria	
Criteria 1	WC/WDM status quo, plans and strategies, budgets, and implementation of projects (Water Resource Diagram, Water Balance, Council approved WC/WDM strategies and budgets)
Criteria 2	Asset management as it relates to meter replacement. Monitoring, analysis, and action of high loss District Metered Areas (DMAs) in metropolitan municipalities
Criteria 3	Technical skills of WC/WDM team
Criteria 5	Compliance and Performance based on the water loss and efficiency Key Performance Indicators (KPI) and year on year improvement there-of

The purpose of the 2023 No Drop Assessments was twofold:

- To complete the consultative assessment of the 144 WSAs as per the No Drop Requirements based on the 2021/22 financial year.
- To update the water balance and water loss benchmarking for the 2022/23 financial year. This is reported on in the Status of Water Loss, Water Use Efficiency and Non-Revenue Water in South African Municipalities (2012/13 to 2022/23).

The No Drop results for Beaufort West Municipality are presented in the table below.

Table A.8.2: No Drop Performance of the Municipality (DWS's 2023 No Drop Report)		
No Drop Score (2021/2022)		91%
Criteria	Weight	Score
1: WC/WDM Strategy, Planning and Implementation	45%	35% (Poor)
2: Asset Management	10%	0% (Critical)
3: Technical Skills	10%	0% (Critical)
5: Compliance and Performance	35%	36% (Poor)
Weighted Sub-Total		28%
Bonus		10%
Score		38% (Poor)
Penalty 1: No evidence of approved budget		0.0%
Penalty 2: Section 82 of the Water Servies Act		0.0%
Criteria 1 Sub-Items: WC/WDM Strategy, Planning and Implementation		
Item	Score (Max = 1)	
1.1: Water Resources	0.0 (Critical)	
1.2: Water Balance	0.7 (Average)	
1.2: WC/WDM Strategy and Business Plan	0.0 (Critical)	
Penalty 1: No evidence of approved budget	0.0	
Criteria 5 Sub-Items: Compliance and Performance		
Item	Score (Max = 1)	
5.1: Reticulation Leak Repair	0.0 (Critical)	
5.2: Physical Water Losses	0.0 (Critical)	
5.3: Commercial Water Losses	0.7 (Average)	
5.4: Non-Revenue Water	0.5 (Average)	
5.5: Water Use Efficiency	0.6 (Average)	
Water Balance Integrity	Medium (Average)	



Regulatory Impression: The score of 38% indicates very poor performance.

- There is a need for targeted turnaround interventions at Beaufort West Local Municipality. The Municipality has not demonstrated a satisfactory understanding of its water use situation and WC/WDM Strategy.
- The IWA water balance did not include all the required components and / or did not cover the entire supply area. The integrity of the water balance was considered to be medium.
- No proof was provided of meter maintenance or replacements during the audit period.
- There was no evidence provided of a competent and qualified water loss management team.
- There was no evidence provided of a leak repair schedule for the audit period.
- The WSA could provide performance indicators for commercial water losses, non-revenue water, water use efficiencies.

DWS's Blue Drop Process: The DWS completed the Blue Drop process for the WSAs in 2023. Blue drop status is awarded to those towns that comply with 95% criteria on drinking water quality management. The blue drop performance of Beaufort West Municipality was summarised as follows in the DWS's 2023 Blue Drop Report.

Table A.8.3: Blue Drop Performance of the Municipality (DWS's 2023 Blue Drop Report)	
Municipal Blue Drop Score	2011 - 92.01%, 2012 – 94.91%, 2014 – 89.52% and 2023 – 53.02%
<p>Introductions: The Beaufort West Local Municipality supplies approximately 54 000 people with potable water through 4 water supply systems. The municipality is responsible for 100% of the total SIV of 9 459 kl/d. For the smaller towns the water supply is quite conventional, either groundwater or surface water.</p> <p>For the Beaufort West system, 50% of the water supplied is groundwater that is abstracted, chlorinated, and mixed with water from the other sources. These are water from the Gamka Dam, about 40%, treated in a conventional WTW, and water from a Water Reclamation Works operated by NuWater, about 10% of the total water supply.</p> <p>It is unfortunate that the BD score dropped from almost 90% in 2014 to 53% during the last audit. The Regulator however notes that, with the exception of Murraysburg, the WSI's systems are in the low Risk Rating category. This discrepancy seems to be due to the WSI's overall approach to the provision of safe potable water where the technical hands-on tasks required to perform this service is prioritised over the need to ensure that the documents, systems, and plans required during the Blue Drop audit are in place. This lack of reproducible evidence (uploaded to the IRIS system) does however not directly relate to a lack of performance in ensuring the community is provided with clean, safe drinking water. The Regulator is however concerned about the Murraysburg system and the WSI is encouraged to ramp up the way in which this system is managed.</p> <p>Regulator's Comments: The WSI is cognisant of the constraints and challenges that needs to be managed to ensure the sustainable provision of potable water to the community they serve. Even though many of the management systems and plans, like Water Safety Plans, were developed during the early stages of the Blue Drop Programme more than 10 years ago, the overall approach to the operation of their water services does have a strong risk-management undertone.</p> <p>Blue Drop Findings: The Regulator finds that the 4 supply systems exhibited similar shortcomings, and summarises the collective recommendations as follows:</p> <ul style="list-style-type: none"> • Process Controllers linked to the smaller supply systems needs to be aligned to the relevant Regulation. Even though process-related tasks on the sites are limited, appropriately skilled personnel need to take responsibility for the Works and be registered on IRIS accordingly. • The same applies to operational monitoring – It needs to be remembered that even simple systems where a limited degree of treatment is required needs to be monitored in line with SANS241:2015 Table 1. • As the Beaufort West system also receives water from a Reclamation Plant, comprehensive, risk-based operational monitoring is in place. • Compliance monitoring needs to be aligned to SANS241:2015 in terms of the frequency at which microbiological analyses is performed. For the smaller systems, the chemical and physical determinants analysed should also be checked and aligned to a risk-based approach, similar to the Beaufort West system. • Risk management is central to the provision of safe water in a sustainable manner and the Water Safety Plans need to be updated. • An Infrastructure Functionality Assessment was conducted by MISA, but the report was unpublished at the time of the audit. The WSI is encouraged to conduct their own Plant and Process Audits as these recommendations are to be incorporated into the WaSP. • No capital projects were noted for the WSI. <p>Technical Site Assessment: The Beaufort West WTW was inspected to assess the condition and functionality of infrastructure and treatment processes on the ground, i.e., to verify the Blue Drop audit findings. The works received a technical site score of 70%. This basic conventional water treatment works is in a fair condition and produces water which complies with the SANS241 standard. The works is somewhat dated, but functional. The largest amount of work required relates to optimising the chlorine dosing facility.</p>	



Table A.8.3: Blue Drop Performance of the Municipality (DWS's 2023 Blue Drop Report)					
The Regulator note the dire state of management and drinking water quality in the Murraysburg and Nelspoort water supply system. The WSI is placed under regulatory surveillance and the Municipal Manager is required to submit a detailed corrective action plan within 20 days of publishing of this report. The plan must map the activities, responsible persons, timelines, and expected improvement as outlined in the Regulatory Comment.					
Performance Area		Beaufort West	Merweville	Murraysburg	Nelspoort
Bulk/WSP		-	-	-	-
Capacity Management	15%	60.81%	52.00%	62.00%	52.00%
DWQ Risk Management	20%	30.20%	12.00%	20.00%	12.00%
Financial Management	10%	66.25%	61.00%	61.00%	61.00%
Technical Management	20%	28.55%	12.50%	20.00%	12.50%
DWQ Compliance	35%	84.00%	53.00%	20.00%	41.00%
Bonus	10%	0.00%	0.00%	0.00%	0.00%
Penalties	10%	0.00%	25.00%	37.50%	25.00%
Disqualifiers		None	None	None	None
Blue Drop Score (2023)	%	56.90%	34.85%	26.65%	30.65%
Blue Drop Score (2014)	%	95.22%	78.33%	48.36%	70.10%
Blue Drop Score (2012)	%	96.30%	86.40%	N/A	74.20%
Blue Drop Score (2011)	%	95.40%	79.70%	N/A	61.20%
System Design Capacity	kl/d	22 144	280	600	500
System Available Capacity	kl/d	15 644	280	600	500
System Input Value	kl/d	8 148	160	749	402
Capacity utilization	%	52.23%	57.14%	124.83%	80.40%
Average Daily Consumption	l/p/d	181	129	176	115
Resource Abstracted From		Boreholes / Ganka Dam / Reclaimed Water	Boreholes	Boreholes	Soutrivier augmented by boreholes
Microbiological Compliance	%	99.99%	99.99%	95.83%	99.99%
Chemical Health Compliance	%	99.59%	99.99%	0.00%	99.99%
Risk Defined Compliance	%	93.62%	94.17%	76.67%	81.25%
VROOM	Rand	R4 540 000	-	-	-
BDRR 2023	%	22.97%	17.76%	56.42%	17.76%
BDRR 2022	%	15.70%	29.10%	39.40%	28.60%

The average residential daily consumption (l/p/d) for the last four financial years are summarised in the table below.

Table A.8.4: Average residential daily consumption (l/p/d) for the last four financial years.						
Distribution System	2022/2023			2023/2024		
	Estimated Permanent Population	Aver. Daily System Input Volume (kl)	Aver. Daily residential consumption (l/p/d)	Estimated Permanent Population	Aver. Daily System Input Volume (kl)	Aver. Daily residential consumption (l/p/d)
Beaufort West	40 150	7 667	191	40 753	10 226	251
Merweville	1 875	166	89	1 903	178	94
Nelspoort	1 896	392	207	1 914	327	171
Murraysburg	5 971	806	135	6 061	1 072	177
Total	49 892	9 031	181	50 631	11 803	233
Distribution System	2020/2021			2021/2022		
	Estimated Permanent Population	Aver. Daily System Input Volume (kl)	Aver. Daily residential consumption (l/p/d)	Estimated Permanent Population	Aver. Daily System Input Volume (kl)	Aver. Daily residential consumption (l/p/d)
Beaufort West	38 972	7 423	190	39 577	8 143	206
Merweville	1 820	237	130	1 848	191	103
Nelspoort	1 858	420	226	1 877	399	
Murraysburg	5 796	925	160	5 883	785	
Total	48 446	9 005	186	49 165	9 518	



The DWS completed the new Green Drop assessment for the WSAs in 2021 and the results were received early in 2022. Green drop status is awarded to those WSAs that comply with 90% criteria on key selected indicators on wastewater quality management. The green drop performance of Beaufort West Municipality is summarised as follows in the DWS's 2022 Green Drop Report.

Table A.8.5: Green Drop Performance of the Beaufort West Municipality (DWS's 2022 Green Drop Report)	
Average Green Drop Score	2009 – 43.0%, 2011 – 90.0%, 2013 – 80.0%, 2021 – 59.0%
<p>Regulator's Comment: Beaufort West was represented by the Manager Technical Services, a senior clerk, as well as relevant officials as/when required to provide a wide-angle perspective on wastewater services. The team was well prepared and had evidence categorised based on the assessment criteria. The municipality achieved a 59% Green Drop score which is a regress from the 80% baseline in 2013 and 90% in 2011. However, the Regulator note that systems, processes, and qualified persons have been put in place, which bodes well to return to this excellent status by time of the next audit in 2023. Unfortunately, the Murraysburg system is a reason for concern and impacts negatively on the overall municipal score.</p> <p>Areas for improvement include plans and systems linked to the Technical Management Category, like Process Audits and Sewer Mains Inspections, as well as implementing updated Wastewater Risk Abatement Plans. Flow metering and process monitoring remains a gap and contributed to a penalty for lack of inflow and outflow measurement. The Regulator would like to encourage the WSA to use the information from the current Green Drop audit as a baseline from which to move beyond compliance once again and into excellence. The Regulator is satisfied that 3 WWTWs reside in low risk space, and 1 plant in medium risk position.</p> <p>Green Drop findings:</p> <ol style="list-style-type: none"> 1. Plant Supervisor, and Process Controller registrations are in place at most of the systems with the WSA complying with the Green Drop standard (Draft Reg. 813) 2. Inhouse competencies of the Millwright could be verified, who oversees maintenance performed by Service Providers. The capacity of the Service Providers was considered before a contract was awarded 3. Engineering capacity is available inhouse and scientific capacity is currently provided by the external laboratories. The internal laboratory must assure that quality assurance, such as PTS and Z-scores, are in place for operational monitoring. 4. Older versions of Wastewater Risk Abatement Plans are available. Even though these need to be updated, risk management principles still prevail within the municipality 5. Operational and compliance monitoring is in place for the Beaufort West system. Merweville and Nelspoort are considered as zero-effluent systems and some of the compliance monitoring requirements is waived. Monitoring at Murraysburg is however lacking. 6. Financial information was provided. Murraysburg was however excluded from this as the system initially fell within another WSA's jurisdiction. Effort must be put to get this plant up to the same standard as the others. 7. Flow measurement is in place for Beaufort West WWTW, but not for the remaining systems, predominantly due to the flows being too low to do accurate flow measurement. Alternative ways of monitoring may be implemented i.e., pump hours, etc. to ensure the plant is not hydraulically overloaded. 8. No monitoring is in place at Merweville and Nelspoort, which are seen as zero-effluent systems. The same situation prevails at Murraysburg even though the final effluent is being irrigated. 9. NMR requirements on final effluent need to be verified by way of Authorisations during the next audit to waive monitoring of these systems. However, good practice would still require monitoring of the raw and final effluent as a minimum. 10. Beaufort West WWTW is producing effluent of an acceptable quality, noting that only microbiological quality achieved the excellence standard of >90%. 11. A capital project is in place to address some of the gaps identified: R42,696,730: Upgrade of the Beaufort West WWTW – funds not secured yet. <p>The Regulator is concerned about the overall poor state of wastewater services at the Murraysburg systems 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 out lined in the Regulatory Comment. The plan will be considered against the Regulatory Comment and recommended for approval by a national regulation committee.</p> <p>The Beaufort West WWTW was inspected to verify the Green Drop audit findings (Technical Site Assessment: Beaufort West WWTW 64%):</p> <ul style="list-style-type: none"> • The network and pumpstation was in good condition, with operations and maintenance attended to. • Screens were covered with GRP-plates as good practice. • Logbooks & systems were adequate, but Process Controllers should be encouraged to take more responsibility for their WWTW, start interpreting data collected and first order maintenance. 	


Table A.8.5: Green Drop Performance of the Beaufort West Municipality (DWS's 2022 Green Drop Report)

- Minor building repairs were required. The staff facilities seem to be due for an update.
- Upgrades to the Head of Works would include a screening washing system with compactor and/or conveyor.
- The incinerator on site was in fair condition.
- The biofilter section of the plant has been de-commissioned. Indications are, however, that the Activated Sludge Plant has sufficient capacity to deal with the current load.
- A few signs of spalling concrete on reactor walkway were visible. This creates questions around condition of concrete on submerged sections.
- Provision has been made for additional aerator to be installed. As the hydraulic capacity is in order the installation of another aerator would be a meaningful upgrade and will contribute to effluent quality improvement in the chemical category.
- The corrosive nature of ferric was noted and need to be addressed as risk, i.e. tanks be replaced on a regular basis.
- The chlorine dosing facility was functional but could be upgraded. The building is, by design, open while more modern trends are to contain chlorine gas, especially noting that one of the residential areas is expanding in the direction of the WWTW.
- Only lagoons were in use for sludge handling.
- Having a Water Reclamation Works linked to the system creates a certain expectation in terms of technology use on site and as such it would be fitting to start considering sludge as a resource as opposed to simply storing it for future disposal.

GREEN DROP REPORT CARD					
Key Performance Area	Weight	Beaufort West	Merweville	Nelspoort	Murraysburg
A: Capacity Management	15%	74.0%	92.5%	92.5%	55.0%
B: Environmental Management	15%	60.5%	37.5%	25.0%	12.5%
C: Financial Management	20%	74.5%	68.1%	55.6%	0.0%
D: Technical Management	20%	60.0%	15.3%	15.3%	15.3%
E: Effluent & Sludge Compliance	30%	46.3%	100.0%	88.8%	18.8%
F: Bonus		25.5%	10.5%	10.5%	3.8%
G: Penalties		0.0%	-25.0%	-25.0%	-25.0%
H: Disqualifiers		None	None	None	None
2021 Green Drop Score		64%	64%	56%	16%
2013 Green Drop Score		94%	89%	89%	12%
2011 Green Drop Score		91%	59%	88%	57%
2009 Green Drop Score		83%	20%	26%	0%
System Design Capacity (Ml/d)		4.659	0.39	0.2	0.5
Design Capacity Utilisation (%)		57%	NI	NI	77%
Resource Discharged into		Reclamation	No Discharge	No Discharge	Irrigation to Field – 400m from Buffelsrivier
Microbiological Compliance (%)		92%	NMR	NMR	No Monitoring
Chemical Compliance (%)		84%	NMR	NMR	No Monitoring
Physical Compliance (%)		56%	NMR	NMR	No Monitoring
Wastewater Risk Rating (CRR% of CRRmax)					
CRR (2011)		35.3%	23.5%	29.4%	NA
CRR (2013)		23.5%	58.8%	64.7%	94.1%
CRR (2021)		47.1%	35.3%	35.3%	52.9%

2022-2027 WATER SERVICES DEVELOPMENT PLAN: EXECUTIVE SUMMARY



Beaufort West Municipality also received their 2023 Green Drop Risk Ratings, as calculated from the 2023 assessment done by the DWS.

Table A.8.6: Green Drop Risk Rating of the Beaufort West Municipality (DWS’s 2023 Green Drop Progress Report)						
Municipal CRR% 2023 (%CRR/CRRmax)		68.7%				
Introduction:						
Beaufort West Local Municipality is a town situated in the Great Karoo region of the Western Cape, which is home to a population of approximately 51 074 people and includes the towns of Beaufort West, Merweville, Murraysburg and Nelspoort. The Beaufort West Local Municipality owns and operates the four WWTWs in each of these towns. The Beaufort West WWTW is an activated sludge plant while the WWTWs at Merweville and Nelspoort are Oxidation pond systems. No information is available for the Murraysburg WWTW.						
Regulator’s Comment: According to the CRR calculation, two of the four WWTWs are classified as critical risks (Merweville and Nelspoort) while a third (Murraysburg) is classified as a high risk system. It is noted that these systems have also all showed an increase in their risk ratings since the 2023 audit.						
The Murraysburg system has not been classified and this should be addressed as soon as possible. In addition, it is noted that there is a lack of flow measurement at both the oxidation pond systems (Merweville and Nelspoort). It is required that all flows are measured and the WSA must ensure that flow meters are installed/ repaired, daily flow readings are recorded, and annual meter calibration is conducted.						
The water quality monitoring data indicates that the Beaufort West system is monitoring the effluent discharged however 50% of the parameters are non-compliant. The Nelspoort system does not discharge, but no monitoring is taking place here. The Merweville and Murraysburg systems are both not compliant with all effluent parameters. The WSA is urged to ensure that sufficient monitoring of the final effluent is taking place, and that the LM strives to ensure compliance of the effluent with the regulatory limits to ensure the health and well-being of the communities and the environment downstream.						
There is a lack of technical skills especially with regards to the lack of qualified Supervisory staff and insufficient Process Controllers. The WSA is urged to ensure that these positions are prioritized and filled with qualified and competent staff as soon as possible. Some maintenance capacity is noted and the WSA should ensure that the operational and maintenance teams are aligned with the regulatory requirements.						
A significant risk exists due to the lack of information provided evidenced by the critical risk rating of two of these WWTWs and the high risk rating of the third works. A lack of wastewater management and risk management is evident as there is no W ₂ RAP documentation or GDIP documentation loaded onto the IRIS. In addition, there is no evidence of a Corrective Action Plan or financial information available and no evidence of any capital budget for refurbishment has been provided.						
The WSA should develop the W ₂ RAP and GDIP as a matter of urgency to address the poor wastewater management and effluent quality which is being discharged at present. The WSA is encouraged to develop a W ₂ RAP, have it signed and annually reviewed and implementing the risk-based methodology for the purpose of minimizing the overall risk rating and improving effluent quality. The WSA must develop and implement a GDIP which identifies the shortcomings for all Green Drop Criteria, allocate responsibility, as well as budget and time frames for addressing the gaps identified.						
Risk Assessment Areas		Weight	Beaufort West	Merweville	Murraysburg	Nelspoort
Class of Works			C: Approved	E: Approved	Incomplete	E: Approved
Treatment Technology			Activated Sludge	Oxidation ponds	None	Oxidation ponds
A: Total Design Capacity	Kl/d		4 600	100	1 000	200
B: Operational Capacity (% inflow/design)	%		65.3%	0.0%	30.0%	0.0%
C: Effluent Quality Non-compliance	#		4	3	6	6
% Microbiological Compliance	%		40.0%	0.0%	0.0%	0.0%
% Physical Compliance	%		54.3%	0.0%	0.0%	0.0%
% Chemical Compliance	%		92.1%	NMR	0.0%	0.0%
D: Technical Skills Compliance	%		33.3%	38.9%	22.2%	38.9%
Process Controller Compliance	%		33%	50%	0%	50%
Supervisor Compliance	%		0.0%	0.0%	0.0%	0.0%
Maintenance Team Compliance	%		66.7%	66.7%	66.7%	66.7%
CRR (2023)	%		64.7%	91.7%	80.0%	93.3%
CRR (2021)	%		47.1%	35.3%	52.9%	35.3%
CRR (2013)	%		23.5%	58.8%	94.1%	64.7%



Table A.8.6: Green Drop Risk Rating of the Beaufort West Municipality (DWS's 2023 Green Drop Progress Report)					
CRR (2011)	%	35.3%	23.5%	-	29.4%
W ₂ RAP Status: 2022 Green Drop Report		No Proof	No Proof	No Proof	No Proof
W ₂ RAP Status: 2023 Green Drop PAT		No Proof	No Proof	No Proof	No Proof
Capital and Refurbishment Projects (Rand)		0	0	0	0
Description of Capital and Refurbishment Projects		N/A	N/A	N/A	N/A
2022 GD Score	%	64.0%	64.0%	16.0%	56.0%
GD Improvement Plan (GDIP)	Y/N	No	No	No	No
Corrective Action Plan (CAP)	Y/N	No	No	No	No



SECTION B: STATE OF WATER SERVICES PLANNING

This 2022-2027 WSDP of Beaufort West Municipality is an update of the previous WSDP. The WSDP was drafted according to the DWS's new WSDP website, as rolled out to the Municipalities in the Central Karoo Region on the 15th of November 2017. The WSDP is aligned and integrated with the 2024/2025 IDP of Beaufort West Municipality and needs to form an integrated part of the IDP public participation and consultation process. The IDP is predominantly strategic as opposed to the WSDP that are more operationally orientated with regard to water and sanitation services.

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

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

- Water Master Plan for Beaufort West Municipality (November 2008);
- Sewer Master Plan for Beaufort West Municipality (November 2008); and
- High Level update (December 2021) of the existing Water Master Plan (Dated November 2008).

All forward planning for water and sanitation services and water and sewerage infrastructure should be guided by the Water and Sewer Master Plans.

Updated Water Safety Plans for the WTWs and water distribution systems and W₂RAPs for the various WWTWs and sewer drainage networks are not yet in place. Detail Process Audits were done for all the WTWs and WWTWs during June 2024.

The Municipality needs to compile the WSDP Performance- and Water Services Audit Report annually, as required by the Water Services Act and the DWS. The annual draft WSDP Performance- and Water Services Audit Report needs to be available before the end of October during each financial year and needs to be taken to Council with the Municipality's Annual Report.

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 statement of Beaufort West Municipality is “Beaufort West in the Central Karoo, the economic gateway to the Western Cape, where people are developed and living together in harmony.”

The following KPAs and Strategic Objectives were developed in relation to the above vision and the Municipality’s mission statement:

- Service to the people:
Provide, maintain and expand basic services to all people in the municipal area.
Sustainable, safe and healthy environment.
- Sustainable Economic Growth
Promote broad-based growth and development
- Transparent Organisation
Maintain an ethical, accountable and transparent administration.
- Well-run Administration
Enabling a diverse and capacitated workforce
- Financial Sustainability
Uphold sound financial management principles and practices

Beaufort West Municipality’s Management Area falls within the Breede-Olifants Catchment Management Area. The Breede-Olifants Catchment Management Agency was established by extending the boundary and area of operation of the Breede-Gouritz CMA Water Management Area (Government Gazette No.47559, 25 November 2022).

A Catchment Management Strategy is not yet available for the Breede-Olifants Water Management Area (BOWMA), but the Catchment Management Strategy of the former Breede-Gouritz Water Management Area (BGWMA), July 2017, included 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	% ⁽¹⁾	Solution description as identified by Master Plan	% ⁽²⁾	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % ⁽³⁾
Settlements Summary	Yes	100	Current Housing need is 6 555 households. Continue with the implementation of the recommended SDF proposals for each of the towns and ensure that new developments are in line with these proposals and recommendations.	100	Yes	78.6
	Yes	100	Large number of boreholes in Beaufort West vandalized and yield from groundwater resources in Beaufort West reduced by 47%, due to vandalized and non-operational boreholes. Establish assurance of supply levels of all water sources. Ensure that the provision of bulk water and sewerage infrastructure are aligned with the Housing Strategy (Housing Pipeline) and that housing projects only continue once the required bulk water and sewerage infrastructure are in place, as indicated in the Water and Sewer Master Plans and this WSDP.	100	Yes	78.6
Summary by Settlement Group	No	100				100.0
Assessment Score by Settlement Type	No	100				100.0
Amenities Summary	No	100				100.0

Notes: (1) Is this section addressed in the WSDP?

(2) Were solutions identified for the possible gaps?

(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

The purpose of the SDF is to guide growth and development in the municipal area or space in a sustainable manner. Hence, future growth, development and land use planning departs from a vision and principles that underscore the protection, creation (development) and support (change) of integrated, sustainable settlements and liveable environments to enable economic and social prosperity. Beaufort West Municipality's SDF includes main proposals for each of the towns, with regard to the following categories:

- Core landscape and agricultural areas;
- Urban development;
- Heritage areas;
- Urban restructuring; and
- Urban Edge Amendments.

Beaufort West Municipality's 2024/2025 IDP list the following housing needs for the four towns.

Table C.1.2: Beaufort West Municipality's Housing Needs			
Town	IRDP	GAP / FLISP	Total
Beaufort West	4 822	381	5 203
Merweville	189	11	200
Nelspoort	285	19	304
Murraysburg	834	14	848
Total	6 130	425	6 555



TOPIC 2: SERVICE LEVELS

Topic C.2.1: Service Levels Profile						
Section	Intervention Required?	% (1)	Solution description as defined by topic situation assessment	% (2)	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % (3)
Direct Backlog Water	Yes	100	Compile a Water and Sanitation Service Level Policy. Continue to ensure that there is at least one communal tap for every 25 households in informal areas.	100	No	57.1
	Yes	100	Compile a Water and Sanitation Service Level Policy. Assist private landowners in the rural areas 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 below RDP standard, once practical guidelines and funding become available from the DWS.	100	No	57.1
Direct Backlog Sanitation	Yes	100	Compile a Water and Sanitation Service Level Policy. Install communal toilets in the informal areas to ensure that there is at least one communal toilet for every 5 households in informal areas.	100	No	57.1
	Yes	100	Compile a Water and Sanitation Service Level Policy. Assist private landowners in the rural areas 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 below RDP standard, once practical guidelines and funding become available from the DWS.	100	No	57.1
Water Services Infrastructure Supply Level Profile	No	100				100
Water Reliability Profile	Yes	100	Continue to install communal taps in the informal areas in order to ensure that the ratio of number of households per facility complies with the target of 25 or less households per tap. Assist private landowners as far as possible with the provision of basic water services to all the households on the farms in the rural areas with existing water service levels still below RDP standard, once practical guidelines and funding become available from DWS.	100	No	57.1
Sanitation Service Infrastructure Supply Level Profile	No	100				100
Sanitation Reliability Profile	Yes	100	Install communal sanitation services for the 61 households in informal areas in order to ensure that the ratio of number of households per facility complies with the target of 5 or less households per toilet facility. Assist private landowners as far as possible with the provision of basic sanitation services to all the households on the farms in the rural areas with existing sanitation service levels still below RDP standard, once practical guidelines and funding become available from DWS.	100	No	57.1
Water Services: Education	No	100	Confirm the water service levels of the primary schools in the rural areas. Provide basic water services to the schools if the current water service levels are below RDP standard.	100	No	57.1
Water Services: Health	No	100				100
Sanitation Services: Education	No	100	Confirm the sanitation service levels of the primary schools in the rural areas. Provide basic sanitation services to the schools if the current sanitation service levels are below RDP standard.	100	No	57.1
Sanitation Services: Health	No	100				100
Health and Educational Facilities	No	100				100

Notes: (1) Is this section addressed in the WSDP?

(2) Were solutions identified for the possible gaps?

(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

As a priority it is the responsibility of Beaufort West Municipality to make sure that adequate and appropriate investments are made to ensure the progressive realisation of the right of all people in its area of jurisdiction to receive at least a basic level of water and sanitation services. The grants provided by national government in the form of the municipal infrastructure grant (MIG) will be adequate to ensure universal provision of at least



a basic water supply facility and a basic sanitation facility within a reasonable period of time. This is called a universal service obligation and is the most important policy priority.

Whilst the provision of basic water services is the most important and immediate priority, WSAs are expected to provide intermediate and higher levels of services (for example, water on-site) wherever it is practical and provided it is financially viable and sustainable to do so.

A separate water and sanitation service level policy is not in place, but the water and sanitation service levels to be provided by the Municipality to the consumers in their Management Area are included in By-laws Relating to Water Supply and Wastewater. A Water and Sanitation Services Policy needs to be compiled for Beaufort West Municipality. All water and sanitation services provided by Beaufort West Municipality to consumers within the Municipal Management Area are linked to the Municipality's Tariff Policy (June 2022) and poor households are incorporated through Beaufort West Municipality's Indigent Policy (June 2023).

The National Sanitation Policy (2016) and The Water and Sanitation Services on Privately Owned Land Policy (November 2023) stipulate the responsibility of the WSA with regard to sanitation services and the provision of water and sanitation services on privately owned land.

Beaufort West 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. Standpipes and communal ablution facilities are provided in the informal areas as a temporary emergency service.

Beaufort West Municipality acknowledges the fact that communal standpipes represent probably the weakest part of a network's water supply services. Standpipes must be constructed in ways that can withstand excessive use and should not be neglected in terms of operation and maintenance. Malfunctioning standpipes may adversely affect the health of its already vulnerable and poor users. Communal standpipes are also used by poor households who normally do not pay for water.

Beaufort West Municipality is committed to support the private landowners as far as possible with regard to addressing the basic water services backlog that might still exist on the farms in the rural areas once clear and practical policy guidelines are available from the DWS and funding is made available. Beaufort West Municipality is faced with various challenges with regard to the provision of services on private owned land in a financial sustainable manner (enabling the 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 need it most.

Free basic sanitation policy:

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

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



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

It is important for the schools to focus on Water Demand Management activities and for Beaufort West Municipality to support the schools with WDM initiatives. This will not only aid in Beaufort West 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 medical facilities in Beaufort West Municipality's Management Area are provided with adequate water and sanitation services and no specific strategies, with regard to the provision of water and sanitation services to these facilities, were therefore identified.

Beaufort West 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 Municipal Health Services of the Central Karoo District Municipality 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 factors influence the health conditions of people in any region, for example access to clean water, good sanitation, proper nutrition and adequate housing.

It is important that a co-operative relationship exist between the Central Karoo District Municipality and Beaufort West Municipality with regard to environmental health issues and that a good communication protocol is followed between the District Municipality and Beaufort West Municipality to report on health issues.

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

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

TOPIC 3: WATER SERVICES ASSET MANAGEMENT

Topic C.3.1: Water Services Asset Management						
Section	Intervention Required?	% ⁽¹⁾	Solution description as defined by topic situation assessment	% ⁽²⁾	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % ⁽³⁾
General Information	Yes	100	Develop an Asset Management Plan.	100	No	57.1
	Yes	100	Update Water Safety Plans	100	No	71.4
Operation	Yes	100	Implement recommendations from the WTW Process Audits. Implement proposed interim solutions for improving the operation of the WTW, as well as proposed refurbishment and upgrade and extension work. Ensure adequate budget is allocated for the future upgrading and refurbishment work.	100	Partially	78.6
	Yes	100	Update W ₂ RAPs	100	No	71.4
	Yes	100	Implement recommendations from the WWTW Process Audits. Implement proposed interim solutions for improving the operation of the WWTW, as well as proposed refurbishment and	100	Partially	78.6



Topic C.3.1: Water Services Asset Management						
Section	Intervention Required?	% ⁽¹⁾	Solution description as defined by topic situation assessment	% ⁽²⁾	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % ⁽³⁾
			upgrade and extension work. Ensure adequate budget is allocated for the future upgrading and refurbishment work.			
Functionality Observation	Yes	100	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	Partially	85.7
Asset Assessment Spectrum	Yes	100	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 (Best Practice). 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 (Best Practice).	100	Partially	85.7
Water and Sanitation schemes	Yes	100	Upgrade sections of the water reticulation network and sewer drainage network as proposed in the Water and Sewer Master Plans.	100	Partially	85.7

Notes: (1) Is this section addressed in the WSDP?

(2) Were solutions identified for the possible gaps?

(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

The 2023/2024 IDP list the vandalism of boreholes and pump stations and water losses in Beaufort West as the main water services challenges and the vandalism of the sewer pump stations and facilities as the main sanitation services challenges. The Municipality faces budget constraints in relation to the sanitation service. Only MIG funding allocations are available per financial year. The Municipality does not have any own funding to fund the sanitation service. Other Sanitation challenges / key issues of concern are:

- Operation and Maintenance: No O & M is available;
- Recurring sewer spillages due to aged infrastructure also pump stations;
- Aging infrastructure;
- Asbestos pipes; and
- Struggle to purchase materials due to financial constraints.

Asset Management Plan: 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.



Beaufort West Municipality needs to differentiate between budget allocated towards the operation and maintenance of the water and sewerage infrastructure and the budget allocated towards the replacement of the old 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 old 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.

The objective of an Asset Management Plan 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 maintain 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 increase in (operational) services level coverage's most rapidly. The preparation of maintenance plans and the allocation of sufficient funding for maintenance are required to prevent the development of a large condition backlog. The potential renewal projects for water and sanitation infrastructure need to be identified from the Asset Register. All assets with a condition grading of "poor" and "very poor" need to be prioritised.

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

One of the key challenges of Beaufort West Municipality is to identify adequate funds for the rehabilitation and maintenance of their existing old 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 augmentation of the existing groundwater resources for Beaufort West, the provision of bulk infrastructure and the implementation of measures to reduce the very high NRW and Water Losses, in order to keep up with the high demand for services.

Disaster Management Plan: Disaster Management is continued to be shared with the Central Karoo District Municipality. The Central Karoo District Municipality is responsible for providing Disaster Management Services throughout the Central Karoo Region, which includes municipal areas of Beaufort West, Prince Albert and Laingsburg municipalities. The Disaster Management Centre strives to effectively plan for and minimize the impact of disasters on the community, visitors, infrastructure and environment.

Untreated Effluent Management Plan: There are no known untreated effluent discharges to the environment. The W₂RAPs for the WWTWs and sewer drainage networks need to include Management Procedures and Incident Response and Emergency Protocols to respond to incidents.

Future Water and Sewerage Infrastructure Requirements:

GROUNDWATER INFRASTRUCTURE

All the production boreholes in the four towns were inspected during the WSDP site visits in May 2024. Some of the boreholes are fenced and locked, with alarms systems also installed. A large number of the boreholes in Beaufort West were however vandalised and some of the boreholes are also not operational. Approximately 47% less safe yield is available from groundwater in Beaufort West, due to the non-operational boreholes. **The estimated cost for the refurbishment of the non-operational or vandalised boreholes is R12.850 million.**

Beaufort West Municipality will continue with the implementation of their Groundwater Monitoring Programme for their boreholes. The groundwater monitoring data is currently processed, analysed and reported on by an experienced hydrogeologists on an ad-hoc basis in order to ascertain whether the resources are being sustainably utilised and to ensure compliance with the approved Groundwater Monitoring Programme and water use licenses.



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. A botanical and streamflow monitoring programme is therefore also required. It is important for Beaufort West Municipality to continue to focus on aquifer protection, groundwater monitoring and wellfield management, in order to meet the town's future water requirements.

The table below gives an overview of the key groundwater management functions.

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 supply on a regular basis.	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.
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 preventative maintenance activities, as included under Section 4.1.2 of the Future Demand and Functionality Requirements Report, are to be implemented by Beaufort West Municipality for their surface water infrastructure.

BULK WATER PIPELINE AND WATER RETICULATION NETWORK INFRASTRUCTURE

The Water Master Plan (2021) has indicated that based on the most likely land-use development scenario, the following future bulk water pipeline and water reticulation infrastructure components will be necessary.

Table C.3.3: Future bulk water pipeline and water reticulation infrastructure required					
Scheme	Year	Project	Length	Diameter	Estimated Cost
			m	mm	(R million)
Beaufort West	2025	Inter-connection pipe to improve network conveyance.	8	110	R0.037
	2025	Inter-connection pipe to improve network conveyance.	10	110	R0.039
	2025	Interconnection from 600mm bulk pipeline to the Dorp PRV supply pipeline.	5	315	R0.131
	2025	Replace existing 150mm and 200mm dia. pipe to improve supply capacity to Dorp PRV.	127	400	R0.255
	2025	Replace existing 25mm pipe to improve network conveyance (verify dia. of existing pipe first)	89	315	R0.131
	2025	To improve network conveyance and redundancy.	124	160	R0.225
	2025	Replace existing 75mm pipe to improve network conveyance	267	160	R0.247
	2025	Inter-connection pipe to improve network conveyance.	87	160	R0.155
	2025	Inter-connection pipe to improve network conveyance.	5	160	R0.036
	2025	Mew supply pipeline when future area BFW13 develop.	493	160	R0.526
	2030	Replace existing 125mm pipe to improve network conveyance	249	200	R0.315
	2030	Replace existing 75mm pipe to improve network conveyance	234	160	R0.216
	2030	Replace existing 75mm pipe to improve network conveyance	422	110	R0.375
	2035	Replace existing 75mm pipe to improve network conveyance	222	110	R0.205
	2040	Replace existing 125mm pipe to improve network conveyance (when future areas BFW5, 6 and 7 develop)	332	315	R0.409
	2040	Replace existing 200mm pipe to improve network conveyance	254	355	R0.522
	2040	Replace existing 75mm pipe to improve network conveyance	650	250	R0.568
	2040	Replace existing 100mm pipe to improve network conveyance	249	250	R0.275
	2040	Replace existing 75mm pipe to improve network conveyance	1 075	160	R0.929
	2045	Replace existing 100mm pipe to improve network conveyance (when future areas BFW5, 6 and 7 develop)	607	200	R0.644
	2045	New supply pipeline when future areas BFW5, 6 and 7 develop	363	200	R0.728
	2050	Replace existing 100mm dia. pipes when future areas BFW3 develop.	970	160	R1.019
	2050	Replace existing 50mm dia. pipes when future areas BFW3 develop.	238	160	R0.188
	2050	New supply pipeline when future area BFW5 develop.	478	160	R0.721
	2050	New supply pipeline when future area BFW10 develop.	728	160	R0.780
	Sub-total				R9.676
Merweville	2040	Pipeline required to improve supply to the network (When AADD exceeds 375 kl/d).	272	160	R0.440
	2045	Pipeline required when future areas MV3 develop.	255	110	R0.281
	Sub-total				R0.721
Murraysburg	2025	Pipeline to improve conveyance and fire flow.	367	160	R0.578
	2025	New supply pipeline to improve network conveyance.	193	160	R0.326
	2025	Insert and close valve for rezoning.	-	110	R0.094
	2025	Insert and close valve for rezoning.	-	110	R0.094
	2025	New supply pipeline to improve network conveyance.	193	110	R0.229
	2025	Insert and close valve for rezoning.	-	110	R0.094



Scheme	Year	Project	Length	Diameter	Estimated Cost
			m	mm	(R million)
	2035	Pipeline for development	409	110	R0.451
	2040	Replace existing 75mm pipeline to improve network conveyance.	739	160	R0.644
	Sub-total				R2.510
Total					R12.907

WATER TREATMENT WORKS INFRASTRUCTURE

The existing hydraulic design capacities and the current average daily flows at each of the WTWs are summarised in the table below.

WTW	Existing Hydraulic Capacity	Peak Month Average Daily Flow	Average Daily Flow (Jul 2023 – Jun 2024)	Average Daily Flow as a % of Capacity	Current Required Treatment Capacity (1.5 x AADD10yr)	2023/2024 Water Quality Failures Network (SANS0241:2015)
	MI/d	MI/d	MI/d	%	MI/d	
Beaufort West WTW	4.320	5.736 (Dec)	3.915	90.6	6.136	Turbidity, THM ratio
Beaufort West Reclamation Plant	2.144	2.589 (Feb)	2.113	98.6	2.144	-
Nelspoort WTW	0.500	0.586 (Jan)	0.474	94.8	1.009	Conductivity, Turbidity, Sodium, Chloride, TDS, Sulphate (Aesthetic), Bromoform, THM ratio

Key issues to be addressed at the WTWs, as identified through the WSDP inspection process during May 2024, are as follows.

- Nelspoort WTW: The current fence around the sand filters are not adequate to keep animals out. The chlorine dosing system was not operational at the time of the site visit (Regulator and dosing pump were in for repairs). Various components of the WTWs need to be refurbished. The estimated cost for the upgrading of the Nelspoort WTW is R18 000 000. The proposed works to address the rehabilitation and upgrading of the works, as included in the January 2024 Technical Report, include the items listed in the table below.

Component	Rehabilitation and upgrading work required.
Aeration Towers	<ul style="list-style-type: none"> Refurbish the existing aeration tower, currently treating water from Borehole No.1 and No.2 Provide additional aeration capacity in the vicinity of the existing aeration tower to treat water from all borehole sources. Provide a new aeration tower directly upstream of the slow sand filters. Optimize pipework of the existing aeration tower installations to improve the hydraulic capacity thereof.
Slow Sand Filters	<ul style="list-style-type: none"> Replace all filter media and support media. Refurbish mechanical equipment. General maintenance to filters and associated equipment.
Chlorine Dosing	<ul style="list-style-type: none"> Move motive water connection to the raw water reservoirs. Replace chlorine dosing pumps to enable dosing in the final water rising main. Provide new chlorine dosing point on rising main.
Final Water Pumps	<ul style="list-style-type: none"> Make good the existing final water pump building by means of minor building work refurbishments and painting.
Concrete Repair	<ul style="list-style-type: none"> Concrete repair to existing reinforced concrete structures, including the aeration towers, holding tanks, filters, chambers and buildings.
Miscellaneous	<ul style="list-style-type: none"> Remove all unnecessary equipment and material from the water treatment works and clean up the works in general. Provide the necessary training and skills transfer to the Operators.



- The Beaufort West WTW was operated over its design capacity for some of the months during the last financial year. The recycled water PS was vandalised and no recycling is currently taking place at the plant. There is only one Aluminium sulphate dosing pump, no standby. The scales for the chlorine cylinders are not working. There is only one filter backwash pump, no standby. The fence around the WTW was vandalised. The future upgrading of the WTW will depend on the availability of additional water from the Gamka dam or water from the Springfontein or Walkers dams.

The recommendations from the 2024 WTW Process Audits are included the tables below.

Table C.3.6: Recommendations from 2024 WTW Process Audits		
Problem	Risk	Recommendation
Beaufort West WTW		
One duty coagulant dosing pump.	Reduced water quality / no coagulant dosing in the event of equipment failure.	Reinstate standby dosing pump / system.
Settling tanks too small.	Reduced water quality and additional load on filters.	Provide additional settling tanks.
High filtration rate	Reduced water quality	Provide additional filter area to reduce the filtration rate.
One duty backwash blower.	No redundancy – process failure	Provide standby blower.
One duty backwash pump	No redundancy – process failure	Provide standby pump.
Undefined chemical storage and empty area (no signage or demarcation)	Health and Safety / Process risk if incorrect chemicals are used.	Provide adequate demarcation and signage.
Cracked manhole covers over clearwell.	Health and Safety risk	Replace manhole covers.
No standby chlorine gas bottle on site.	Water Quality risk	Ensure that a standby chlorine gas bottle is kept on site at all times.
Inadequate sample testing	Compliance risk	Ensure the sampling regime is improved to ensure compliance with Blue Drop requirements.
Merweville WTW		
No recommendations		
Nelspoort WTW		
See Table C.3.5 above		
Murraysburg WTW		
No recommendations		

WATER PUMP STATIONS

The water pump stations, as inspected during the WSDP site visits in May 2024, are all operational. Duty and Standby pumps are available for all the pump stations, except at the Garcia Street PS. No leaks were observed at any of the water pump stations. The pump stations are also fenced and locked and some of the buildings are supplied with alarms to prevent any illegal access. Some of the issues to be addressed at the water pump stations, as identified through the WSDP inspection process, are as follows.

- Garcia Street Water PS: The PS was not operational, because the one pump was removed for repairs.
- Noordeinde Booster PS No.1: One motor and pump not operational.
- Noordeinde Booster PS No.2: One pump was removed for repairs.
- Nelspoort WTW Final Water PS: One pump was removed for repairs.

The Uitspan Booster PS is the only pump station that will require upgrading in the nearby future at an estimated cost of R4 000 000.



RESERVOIR INFRASTRUCTURE

The condition of most of the reservoirs in Beaufort West Municipality's Management Area is good and the reservoirs are well maintained. The levels of some of the reservoirs are monitored through the scada systems. Not all the reservoirs are fenced and locked and some of the covers are not locked. Some of the issues to be addressed at the water reservoirs, as identified through the WSDP inspection process in May 2024, are as follows.

- Beaufort West reservoirs at WTW site: Some of the covers of the valve chambers are missing.
- Beaufort West: Noordeinde and Uitspan reservoirs are not fenced.
- Beaufort West: Cover of Vaalkoppies reservoir is not locked.
- Merweville 0.200 MI and 0.400 MI reservoirs: Reservoirs adequately fenced, but covers are not locked.
- Murraysburg 0.500 MI: Fence vandalised and removed. Galvanized roof sheets were stolen. The reservoir is leaking at the floor.

The 2023/2024 storage factors of the total reservoir storage capacity for the various towns, based on 1 x PDD (24 hours storage capacity), are 1.0 for Beaufort West, 1.9 for Merweville, 1.3 for Nelspoort and 0.6 for Murraysburg. Even though the overall storage capacity might be adequate for all of the towns there can be distribution zones within some of the towns with inadequate storage capacity, which require additional reservoirs.

The Water Master Plan (2021) has indicated that based on the most likely land-use development scenario, it will be necessary for the following future reservoirs.

Table C.3.7: Estimated cost of future reservoir storage capacities required				
Town	Recommendations included in the Water Master Plan	Capacity (MI)	When	Estimated Cost (R million)
Beaufort West	New reservoir to increase reservoir storage capacity (Required when AADD exceeds 7.5 MI/d)	4.500	2025	R15.530
	New reservoir to increase reservoir storage capacity (Required when AADD exceeds 7.5 MI/d)	4.500	2050	R15.530
Merweville	Replace old 250 kl reservoir with new 500 kl reservoir (Required when AADD exceeds 375 kl/d)	0.500	2040	R3.285
Nelspoort	Additional capacity required when AADD exceeds 450 kl/d	0.500	2030	R3.285
Murraysburg	Additional reservoir storage capacity for Murraysburg South and North reservoir zones (<i>New 0.500 MI North and 0.200 MI South reservoirs were recently constructed</i>)	1.500	2025	R7.004
Total				R44.634

BULK SEWER PIPELINE AND SEWER DRAINAGE NETWORK INFRASTRUCTURE

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

Table C.3.8: Future bulk sewer pipeline and sewer drainage network infrastructure required					
Scheme	Project	Comments	Length	Diameter	Estimated Cost
			m	mm	(R million)
Beaufort West	Upgrade existing outfall sewer	When future area B4 develop	900	200	R2.061
	Upgrade existing outfall sewer	When overflow problems occur	93	250	R0.319
	Upgrade existing outfall sewer	When overflow problems occur	86	300	R0.367
	Upgrade existing outfall sewer	When overflow problems occur	76	200	R0.232
	Upgrade existing outfall sewer	When overflow problems occur	41	200	R0.156
	Upgrade existing outfall sewer	When overflow problems occur	592	200	R1.380
	Upgrade existing outfall sewer	When overflow problems occur	693	450	R3.487
	New outfall sewer	New outfall for future area B5	215	160	R0.391
	New outfall sewer	New outfall for future area B9	792	200	R1.498
	New outfall sewer	New outfall for future area B8 & B9	484	200	R0.939
	Upgrade existing outfall sewer	When overflow problems occur	179	375	R0.685



Table C.3.8: Future bulk sewer pipeline and sewer drainage network infrastructure required					
Scheme	Project	Comments	Length	Diameter	Estimated Cost
			m	mm	(R million)
	Upgrade existing telemetry system	To increase reliability of telemetry	-	-	R0.336
	Sub-total				R11.851
Merweville	New outfall sewer	New outfall sewer for existing unserved erven	1 411	160	R2.219
	New outfall sewer	New outfall sewer for existing unserved erven	2 631	160	R4.081
	New syphon	New syphon to cross the river	87	160	R0.415
	Upgrade existing telemetry system	To increase reliability of telemetry	-	-	R0.168
	Sub-total				R6.883
Nelspoort	New outfall sewer	New outfall for future area N2	219	100	R0.398
	New outfall sewer	New outfall for future area N4	386	160	R0.652
	Upgrade existing telemetry system	To increase reliability of telemetry	-	-	R0.336
	Sub-total				R1.386
Murraysburg	Upgrade existing sewer drainage networks	Various sections of the existing sewer drainage network need to be upgraded to ensure adequate capacity.	Unknown	Unknown	R15.000
	Sub-total				R15.000
Total					R35.120

Most of the sewer pump stations are fenced and locked, with duty and standby pumps. Key issues to be addressed at the sewer pump stations, as identified through the WSDP inspection process in May 2024, are as follows.

- Prince Valley Sewer PS: One motor and pump were removed for repairs. Regular network blockage results in overflow.
- Kwa Madlenkosi Sewer PS: Huber drum screen is regularly blocked.
- Nelspoort Main Sewer PS: Overflow due to tripped pump. The fence was vandalised. Only one pump is currently operational. The sump capacity was reported to be inadequate.
- Nelspoort Garage Sewer PS: Only one pump, no standby.
- Murraysburg PS: Only one small pump currently operational. The PS is operated manually because the level sensor is faulty. The fence was vandalised. The flow meter is faulty.

It will be necessary for the following future sewer pump stations.

Table C.3.9: Future sewer pump stations required			
Drainage System	Recommendations included in the Sewer Master Plan	Capacity (l/s)	Estimated Cost 19/20 (R million)
Nelspoort	Provide additional pump for Garage Sewer PS	-	R0.300
	Upgrade Main Sewer PS	15.0	R1.500
Murraysburg	Refurbishment of main Sewer PS	-	R1.750
Total			R3.550



WASTE WATER TREATMENT INFRASTRUCTURE

The table below gives a summary of the existing hydraulic design capacities and current flows at each of the WWTWs, as well as the final effluent quality compliance percentages for the 2023/2024 financial year.

WWTW	Existing Hydraulic Design Capacity	% of System Input Volume used to estimate flow	Estimated Average Daily Flow (2023/2024)	Average Daily Flow as a % of Design Capacity	Final Effluent Compliance for 2023/2024
Beaufort West *	4.659	40%	4.090	87.8%	No monitoring results
Merweville *	0.111	40%	0.071	64.0%	No monitoring
Nelspoort *	0.240	55%	0.180	75.0%	No monitoring
Murraysburg *	0.500	50%	0.536	107.2%	No monitoring results

Note: * Metered Inflow not available – Average Daily Flow based on % of System Input Volume .

The projected future WWTW flows are included in the future water requirement projection models. The table below gives an overview of the average daily future projected WWTW flows.

WWTW	Existing Hydraulic Capacity	Average Daily Future Projected WWTW Flows					Peak Month Average Daily Future Projected WWTW Flows				
		2028	2033	2038	2043	2048	2028	2033	2038	2043	2048
Beaufort West	4.659	5.691	6.492	7.399	8.425	9.583	7.114	8.115	9.249	10.531	11.979
Merweville	0.111	0.062	0.066	0.070	0.075	0.079	0.078	0.083	0.088	0.094	0.099
Nelspoort	0.240	0.279	0.291	0.304	0.318	0.332	0.349	0.364	0.380	0.398	0.415
Murraysburg	0.500	0.553	0.639	0.733	0.837	0.951	0.691	0.799	0.916	1.046	1.189

Note: The peak month factors used in the above table is 1.25

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

The most evident problems at the various WWTW, as summarised in the June 2024 WWTW Process Audit Reports, are as follows:

Beaufort West WWTW:

- The inlet works has only one operational screw pump;
- The Pista Degritter is out of operation and requires mechanical refurbishment;
- One out of the four installed aerators is currently out of operation;
- The activated sludge process only has one SST. At peak wet weather flow, sludge is carried over. This has a negative impact on the sludge age and nitrification;
- The whole system is down if there is a mechanical failure on the SST. This has occurred in the past when one of the wheels broke; and
- The sludge carried over from the SST has a negative impact on the downstream water reclamation plant.

Merweville WWTW:

- Site security is compromised due to damage to the perimeter fence – risk to the community and the municipal assets that are exposed to vandalism and theft;
- The inlet works building has been vandalised and the wash water system to wash the screen is out of operation (The JoJo tanks for wash water storage were located inside the one Primary Pond).
- The flow meter is not fit for purpose and needs replacement with a venturi flume;



- The ponds required a general cleanup of vegetation;
- The irrigation pump station has been vandalised and is out of operation; and
- Regular raw water sampling is not conducted.

Nelspoort WWTW:

- Site security is compromised due to damage to the perimeter fence – risk to the community and the municipal assets that are exposed to vandalism and theft; and
- Regular raw water sampling is not conducted.

Murraysburg WWTW:

- Site security is compromised due to damage to the perimeter fence – risk to the community and the municipal assets that are exposed to vandalism and theft; and
- Regular raw water sampling is not conducted.

The recommendations from the 2024 WWTW Process Audits were as follows:

Beaufort West WWTW: The existing works experiencing occasional unit process failures. This has a negative impact on the final effluent quality and results in occasional non-compliant effluent. To remedy this, the following recommendations were made:

- Reinstate failed screw pump;
- Provide additional mechanical screen for redundancy / standby;
- Refurbish and reinstate degritter;
- Upgrade the process from a MLE process to a UCT process;
- Provide an additional SST;
- Provide additional aeration capacity;
- Refurbish the equipment which is currently out of operation (RAS pumps, etc.); and
- Improve site security as vandalism and theft is a major issue.

Merweville WWTW:

- Conduct regular raw water sampling to monitor sewage constituents;
- Improve perimeter fence to ensure adequate site security and to limit public and livestock trespassing;
- Provide fit-for-purpose flow measurement by means of an ultrasonic sensor and venturi flume in a secure chamber;
- Reinstate service water / wash water system to enable rinsing of the screens;
- Remove JoJo tanks from the pond and replace in the correct location; and
- Refurbish irrigation pump station.

Nelspoort WWTW:

- Conduct regular raw water sampling to monitor sewage constituents; and
- Improve perimeter fence to ensure adequate site security and to limit public and livestock trespassing.

Murraysburg WWTW:

- Conduct regular raw water sampling to monitor sewage constituents; and
- Improve perimeter fence to ensure adequate site security and to limit public and livestock trespassing.



The following upgrades are required with regard to the WWTWs.

WWTW	Short description	Time Frame	Estimated cost (R Million)
Beaufort West	Upgrade WWTW	Short	R49.800
	New irrigation pump station for final effluent	Short	R17.000
Merweville	Refurbishment at oxidation ponds system and security fence	Short	R5.000
Nelspoort	Install improved security fence	Short	R0.500
Murraysburg	Upgrade oxidation ponds	Short	R10.000
Total			R82.300

TOPIC 4: WATER SERVICES OPERATION AND MAINTENANCE

Section	Intervention Required?	% ⁽¹⁾	Solution description as defined by topic situation assessment	% ⁽²⁾	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % ⁽³⁾
O & M Plan	Yes	100	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	Partially	78.6
Is There an O&M Plan?						
Resources	Yes	100	A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of existing water and sewerage infrastructure (Best Practice). 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 (Best Practice).	100	Partially	78.6
	Yes	100	Beaufort West Municipality needs to ensure that the number of process controllers at each of the WTWs and WWTWs and the class of process controller complies with the required number of process controllers and class of process controller per plant (New Regulation 3630).	100	Partially	78.6
Information	Yes	100	All incidents at the WTWs and WWTWs and on the water reticulation networks and sewer drainage networks need to be recorded and Incident Management Protocols, to be included in the Water Safety Plans and W ₂ RAPs, need to be followed after an incident.	100	Partially	78.6
	Yes	100	Ensure that the required O&M Manuals are in place for all the water and sewerage infrastructure.	100	Partially	78.6
Activity Control & Management	No	100	Groundwater: Implement recommended daily, weekly, monthly and six monthly O&M activities for the boreholes.	100	Partially	85.7
	No	100	Surface water infrastructure: Implement preventative maintenance procedures.	100	Partially	85.7
	No	100	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	Partially	85.7
	No	100	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	Partially	85.7
	No	100	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	Partially	85.7
	No	100	Reservoirs: Compile maintenance checklists for the recommended reservoir maintenance activities and document all inspections.	100	Partially	85.7
	No	100	Remote monitoring and Control Systems: Ensure adequate maintenance is carried out on the SCADA systems and compile maintenance checklists for the recommended activities.	100	Partially	85.7
	No	100	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	Partially	85.7
	No	100	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	Partially	85.7
	No	100	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	Partially	85.7



Notes: (1) Is this section addressed in the WSDP?
(2) Were solutions identified for the possible gaps?
(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

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 large extent on 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 Beaufort West Municipality needs an O&M system that monitors and assesses infrastructure condition and plans for the required preventative maintenance, and when necessary, rehabilitation, upgrading or replacement of the infrastructure. This is a major part of an overall Asset Management System, which

- records and 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.
- Take action 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 well 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.

In order 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 contract 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. There are a number of standard recommended O&M tasks, for the various water and sewerage infrastructure components, which should be implemented by Beaufort West Municipality.



A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of existing old 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 (Best Practice).

The table below gives an overview of the Opening Costs (OC) and Carrying Values (CV) of the water and sewerage infrastructure included in Beaufort West Municipality's Asset Register (June 2023). The recommended budgets for the replacement of the existing infrastructure and the operation and maintenance of the existing infrastructure, based on the CRC of the water and sewerage infrastructure included in the WSDP, are also indicated.

Table C.4.2: Recommended budgets for the replacement and the operation and maintenance of the existing water and sewerage infrastructure.					
Asset Type	Asset Register June 2023		CRC of water and sewerage infrastructure in WSDP	Recommended Annual Replacement Budget (Best Practice)	Recommended Annual O&M Budget (Best Practice)
	Opening Cost	Carrying Value		2.0% of CRC	1.5% of CRC
Water Infrastructure					
Boreholes	R23 166 084	R18 600 474	R101 954 000	R2 039 080	R1 529 310
Dams and weirs	R7 010 935	R2 055 858	R17 000 000	R340 000	R255 000
Bulk water pipelines	R34 015 907	R20 778 939	R46 804 700	R936 094	R702 071
Water reticulation	R11 000 744	R5 441 592			
Water pump stations	R6 548 546	R4 148 100	R27 850 000	R557 000	R417 750
Reservoirs	R42 839 316	R26 011 128	R70 574 000	R1 411 480	R1 058 610
WTWs	R18 914 626	R9 898 951	R136 625 000	R2 732 500	R2 049 375
Total Water	R143 496 158	R86 935 042	R400 807 700	R8 016 154	R6 012 116
Sewerage Infrastructure					
Sewer drainage networks	R34 146 897	R14 750 211	R205 327 000	R4 106 540	R3 079 905
Sewer pump stations	R11 794 625	R4 901 249	R13 750 000	R275 000	R206 250
WWTWs	R59 905 584	R3 667 726	R115 680 000	R2 313 600	R1 735 200
Total Sewerage	R105 847 106	R44 560 041	R334 757 000	R6 695 140	R5 021 355
Total Water and Sewerage	R249 343 264	R131 495 083	R735 564 700	R14 711 294	R11 033 471

TOPIC 5: CONSERVATION AND DEMAND MANAGEMENT

Topic C.5.1: Conservation and Demand Management - Water Resource Management						
Section	Intervention Required?	% ⁽¹⁾	Solution description as defined by topic situation assessment	% ⁽²⁾	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % ⁽³⁾
Reducing unaccounted water and water inefficiencies	Yes	100	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	Partially	78.6
	Yes	100	Swift analysis needs to be done, where after meetings should be set up 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	No	71.4
Leak and meter repair programmes.	Yes	100	Implement 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. An exercise could also be initiated to check for visual leakage at public buildings, using more than 60 kl/month.	100	No	71.4
	Yes	100	Allocate sufficient budget for the successful implementation of a pipeline replacement programme. The location of pipe failures should in the future be recorded, preferably with accurate GPS coordinates. A PRP Study needs to be done for Beaufort West Municipality.	100	No	71.4
	Yes	100	Swift analysis needs to be done. Install water meters at all the unmetered erven and inspect metered erven with zero consumption.	100	No	71.4
Consumer/end-use demand	Yes	100	At least once a year, a schools education programme on water conservation should be undertaken. The	100	No	71.4



Topic C.5.1: Conservation and Demand Management - Water Resource Management						
Section	Intervention Required?	% ⁽¹⁾	Solution description as defined by topic situation assessment	% ⁽²⁾	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % ⁽³⁾
management: Public Information & Education Programmes			Municipality should assist the school(s) with the monitoring (water audit) of their water consumption. Beaufort West Municipality can also focus on the implementation of an extensive schools WDM programme, which can include annual competitions between schools (Say with a prize for the lowest consumption, the lowest per capita consumption and for the best WDM Strategy poster design, etc.). A schools WDM programme should receive a high priority.			
	Yes	100	Continue to focus on the installation of water saving devices (specific water efficient toilets) and raising awareness regarding conservation projects and the installation of these products in order to reduce water demand. The use and installation of these fittings should be included as a condition for the approval of building plans as well as provided for in the Water Services By-law.	100	Partially	78.6
Conjunctive use of surface - and groundwater	No	100				100
Working for Water	No	100				100

Notes: (1) Is this section addressed in the WSDP?

(2) Were solutions identified for the possible gaps?

(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

Topic C.5.2: Conservation and Demand Management - Water Balance						
Section	Intervention Required?	% ⁽¹⁾	Solution description as defined by topic situation assessment	% ⁽²⁾	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % ⁽³⁾
Water Balance	Yes	100	Continue to 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 WTWs 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	Partially	78.6

Notes: (1) Is this section addressed in the WSDP?

(2) Were solutions identified for the possible gaps?

(3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

A Water Distribution Losses Policy was approved by Council on the 6th of June 2023. The following control and monitoring activities are included in the Policy.

- To keep the losses to a minimum, the metering of water must be monitored sufficiently;
- The water losses must be monitored on a monthly basis;
- Distribution meters must be installed to obtain meaningful meter data, to calculate losses accurately in terms of volume and per distribution area, if possible (ward etc.);
- A formal system of communication should be maintained or put in place to ensure effective and efficient communication between the revenue department and the technical department. This will ensure that meters replaced, meters reset, disconnections, last readings, etc. being accounted for to ensure that the municipality suffer no losses in this regard; and



- The billing system must be used to detect possible cases of illegal connections (deviation / exception reporting). If theft is detected, the water supply to the premises will be disconnected and a fine need to be paid at a rate as published in the municipal tariffs applicable to the financial year it relates to. Action will be taken as in terms of the municipal policy relating to customer care, credit control and debt collection and criminal charges should be considered.

The Municipality must have the intention to keep the losses of water below a specified percentage of the total water purified and distributed.

The Policy stipulates that the water losses must be reported to the Director: Infrastructure on a monthly basis by means of a monthly report. Other reporting requirements include the following:

- Quarterly reporting to the DWS regarding water losses;
- Reporting on a quarterly basis in terms of section 52 of the MFMA;
- The total water losses incurred, must be made public in the annual financial statements of the municipality;
- Water losses are also reported in the Mid-Year Performance Report of the municipality.

The water losses reporting on in terms of financial reporting, must be clearly indicate the quantity in terms of the units (KI) lost as well as the financial implication of the losses.

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 Beaufort West Municipality. The proposed WC/WDM Strategy for Beaufort West Municipality is based on the 25 items included in the Scorecard and the sections below discuss each of these items in detail.

Table C.5.3: Proposed WC/WDM Strategy Items for Beaufort West Municipality
Item 1: Development of a Standard Water Balance
Recommendation and Strategy: <ul style="list-style-type: none"> 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. Continue to manage NRW analysis on a monthly basis. Draft an annual WSDP Performance and Water Services Audit Report, as required by the Water Services Act, which include the IWA Water Balances. Implement the recommended WC/WDM activities in order to reduce the NRW and Water Losses. Phase out all "Cashflow" prepaid water meters and ensure that the volumes of estimated accounts are also recorded in the billing system. Determine all unbilled authorized consumption by firstly identify all the relevant consumers, e.g. Municipal buildings, parks, fire services, sport fields, etc. Unbilled consumption do 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 need to be updated on a monthly basis by the municipality.
Item 2: Pressurised System at all times
Recommendation and Strategy: <ul style="list-style-type: none"> Adequate human resources, technical skills and O&M budgets need to be allocated towards the operation, maintenance and refurbishment of the existing infrastructure, in order to ensure that the systems are always pressurised. Ensure proper maintenance of the existing PRVs in Beaufort West. The Water Master Plans to be consulted in conjunction with the WC/WDM priority projects to identify future areas where pressure reduction can be implemented.
Funding and Budget Requirements: <ul style="list-style-type: none"> 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. A budget of R5 000 000 is required for the implementation of additional PRV zones.
Items 3 and 4: Metering System
Recommendation and Strategy: <ul style="list-style-type: none"> All "Cashflow" prepaid water meters to be phased out. All un-metered water connections need to be provided with water meters. Meters need to be read on a monthly basis 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 particular water use event. The SWIFT data needs to be used to clean the Treasury data and the municipality needs to identify and correct any inaccurate data in the system (Linkage of Treasury data with cadastral data).



Table C.5.3: Proposed WC/WDM Strategy Items for Beaufort West Municipality
<ul style="list-style-type: none"> Consumer consumption checks / investigations need to be carried out where water usage are very low, but there are households on the property (Use SWIFT data). 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. Use the SWIFT data to identify all unmetered erven and all meters with zero consumption. 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 inspections. 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: <ul style="list-style-type: none"> 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. <p>The activities of this program that needs to be budgeted for are as follows:</p> <ul style="list-style-type: none"> SWIFT analysis of treasury data. 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: Allow a budget of approximately R200 000 for an annual SWIFT analysis to identify unmetered erven and erven with no or very low consumption. Estimated annual budget required for the installation of individual water meters is R2 500 000.
Item 5: Effective and Informative Billing System
Recommendation and Strategy: <ul style="list-style-type: none"> Municipality needs to continue to ensure that all customer's meters are read on a monthly basis 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 start with commercial data analysis on the billed metered consumption data, which include the identification of un-metered erven, 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. <ul style="list-style-type: none"> 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 R400 000.
Items 6 and 7: General Complaints System
Recommendation and Strategy: The municipality needs to continue to ensure that all consumers are familiar with the telephone numbers to lodge complaints and report leaks. Telephone numbers to lodge complaints and report leaks should be included on the monthly water bills and on the Municipality's website. Suggestions would be to also include it on strategically located notice boards, radio broadcasts, etc. The projects and measures that can be implemented for passive leakage control are as follows: <ul style="list-style-type: none"> 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. <p>A Consumer Services Charter should be drafted, which include the following information:</p> <ul style="list-style-type: none"> 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 with regard to the Municipality's Complaints System R150 000/annum.
Item 8: Asset Register for Water Infrastructure
Recommendation and Strategy: <ul style="list-style-type: none"> Continue with the annual updating of the Asset Register. Continue to ensure that all the existing water and sewerage infrastructure are included in the Asset Register.
Funding and Budget Requirements:



Table C.5.3: Proposed WC/WDM Strategy Items for Beaufort West Municipality
None - To be done as part of the annual updating of the Asset Register by the municipality.
Item 9: Asset Management Capital Works
<p>Recommendation and Strategy:</p> <p>Allocate a budget of at least 2% of the total water asset value (CRC) 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, in order to accurately calculate the annual percentage allocated towards the replacement of existing infrastructure (Best Practice).</p>
<p>Funding and Budget Requirements:</p> <p>Capital budget of at least 2% of the total water and sewerage asset value (CRC) allocated annually towards the replacement of the existing water and sewerage infrastructure (Best Practice).</p>
Item 10: Asset Management Operation and Maintenance
<p>Recommendation and Strategy:</p> <p>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 old water and sewerage infrastructure. A budget of approximately 1% to 2% of the value of the system (CRC) is typically required for the operations and maintenance of the system and to ensure that the system remains in good condition.</p> <p>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. The purpose of the AMP is to:</p> <ul style="list-style-type: none"> • Ensure the operation and maintenance functions are well planned; • Demonstrate responsible management; • Justify and communicate funding requirements; and • Service provisioning complies with regulatory requirements. <p>An AMP normally includes the following:</p> <ul style="list-style-type: none"> • documents the nature, extent, age, utilization, 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. <p>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.</p> <p>This plan must be based on the principle of preventative maintenance in order to ensure that, as far as this is practical, damage to assets is prevented before it occurs. 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's most rapidly. The preparation of maintenance plans and the allocation of sufficient funding for maintenance are required to prevent the development of a large condition backlog. The potential renewal projects for 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.</p> <p>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. The budget should also be used for preventative maintenance, which include the following:</p> <ul style="list-style-type: none"> ➢ Inspection of isolation valves and packing. ➢ Control valve inspection and maintenance. ➢ Inspection of cathodic protection of steel pipes.
<p>Funding and Budget Requirements:</p> <p>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 (CRC) is typically required for the operations and maintenance of the system to ensure that the system remains in good condition (Best Practice).</p> <p>An estimated budget for the drafting of an AMP for all the water and sewerage infrastructure is R750 000.</p>
Item 11: Dedicated WC/WDM Support
<p>Recommendation and Strategy:</p> <p>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.</p>
<p>Funding and Budget Requirements:</p> <p>The municipality may be able to use one of their existing staff members. If a new person has to be appointed the municipality can determine the costs involved with such an appointment.</p>
Item 12: Active Leakage Control



Table C.5.3: Proposed WC/WDM Strategy Items for Beaufort West Municipality
<p>Recommendation and Strategy:</p> <p>The following process needs to be followed for active leakage control of the reticulation network:</p> <p><u>Decide on how the work will be undertaken:</u></p> <ul style="list-style-type: none"> Option 1: The appointment and training of additional staff. Option 2: The training of existing staff. Option 3: 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. Option 4: Complete outsourcing of the activity. <p>The first three options need to include the purchase or re-allocation of equipment.</p> <p><u>Leak detection:</u> Identify areas with highest leaks and send teams into the field to detect leaks.</p> <p><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.</p>
<p>Funding and Budget Requirements:</p> <p>R300 000 to undertake leak detection in zones with high excess night flows. In addition allocate approximately R100 000 per year for general visual leak inspections.</p>
Item 13: Sectorization of Reticulation Systems
<p>Recommendation and Strategy:</p> <p>The billed metered data is currently linked to the distribution systems and should also be linked to the different zones in the future where possible, in order to accurately determine the NRW and water losses for the specific zones in the future. Faulty bulk water meters need to be replaced and new meters need to be installed for the zones with no bulk water meters. The current bulk water meters are indicated in Table 5.1.2.3.1 of Topic 5 of the Administration, Information and Comprehensive Overview Report.</p> <p>The Financial Department needs to provide the billed metered consumption data separately for the different zones in the future in order to assist with the following:</p> <ul style="list-style-type: none"> 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. <p>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.</p>
<p>Funding and Budget Requirements:</p> <p>The estimated cost for the logging of flows and pressures for zones with expected high water losses is R500 000. The logging exercise should be repeated at least every three years.</p> <p>A budget should be allocated to investigate and resolve possible zone interconnections. It is however difficult to price such investigations at this stage.</p>
Item 14: Effective Bulk Metering Management System
<p>Recommendation and Strategy:</p> <ul style="list-style-type: none"> Municipality needs to continue to read all the bulk water meters at the existing WTWs, reservoirs, pump stations and on the bulk supply pipelines for specific zones and need to record the readings on at least a monthly basis. All bulk water meters need to be installed in lockable meter chambers and reservoir sites and water pump stations need to be secured in order 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 unmetered 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 monthly basis. The readings can be used to quantify both the water supplied and the leakage for a specific area.
<p>Funding and Budget Requirements:</p> <p>Allow an annual budget of approximately R400 000 for the installation of new bulk water meters, the replacement of faulty bulk water meters and to adequately protect existing bulk water meters.</p>
Item 15: Effective Zone Meter Management and Assessment of Night Flows
<p>Recommendation and Strategy:</p> <p>See recommendations under Item 14.</p>
<p>Funding and Budget Requirements:</p> <p>See funding and budget requirements included under Item 14.</p>
Item 16: Pressure Management
<p>Recommendation and Strategy:</p> <p>See Item 2.</p>
<p>Funding and Budget Requirements:</p> <p>See Item 2.</p>
Item 17: As-built Drawings of Bulk and Reticulation Infrastructure
<p>Recommendation and Strategy:</p>



Table C.5.3: Proposed WC/WDM Strategy Items for Beaufort West Municipality
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 R2.000 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 existing Water Supply and Wastewater By-laws need to be updated, in order to ensure that the by-law adequately allow for WC/WDM measures.
Funding and Budget Requirements: Allow a budget of R180 000 for the updating of the existing Water Supply and Wastewater By-law.
Item 20: Tariffs
Recommendation and Strategy: See Section 7.3 under Topic 7 of the Future Demand and Functionality Requirements Report.
Funding and Budget Requirements: Financial study to determine the impact of changing the sanitation tariff structure from a fixed annual amount to a stepped tariff based on water consumption in the future. Estimated cost of a financial analysis is 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:
<ul style="list-style-type: none"> • 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 buildings; • 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: Beaufort West 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 Report.
Funding and Budget Requirements: Estimated annual budget of R500 000 is required to install water meters at any unmetered even.
Item 23: Community Awareness on WDM
Recommendation and Strategy: See Section 5.1.3 of the Future Demand and Functionality Requirements Report.
Funding and Budget Requirements: It is estimated that R150 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 Report.
Funding and Budget Requirements: Allow a budget of approximately R50 000 per year for the implementation of WC/WDM measures at schools (Competitions, Awareness Raising events, etc.). 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 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: R500 000 for a pilot project in one of the public buildings.



The way forward for Beaufort West 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.

Beaufort West 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 taken into account during Beaufort West 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; and
- 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 Beaufort West 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.

Beaufort West Municipality has responded to the need to address NRW and water losses within their jurisdiction by implementing various WC/WDM initiatives over the last number of years. The Municipality will also continue to actively implement the proposed WC/WDM Strategy in order to reduce the percentage of NRW and Water Losses and to improve water use efficiency within the various schemes as follows.

Table C.5.4: Commitment to reduce NRW and water inefficiencies				
Distribution System	2023/2024		Committed Future NRW	
	NRW (%/a)	Water Losses (%/a)	2028 (%/a)	2048 (%/a)
Beaufort West	77.1%	76.9%	30.0%	15.0%
Merweville	46.5%	46.3%	30.0%	10.0%
Nelspoort	63.1%	62.9%	30.0%	15.0%
Murraysburg	93.4%	93.2%	30.0%	15.0%

A SWIFT analysis need to be done to determine all the unmetered erven and the metered erven with no consumption and very low consumption. The unmetered erven should be metered and consumers in the billing system should be updated where required. All meter boxes should also be cleaned regularly.



IWA 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 Beaufort West 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.

Beaufort West Municipality should assess the strategic gaps in their IWA water balance data and record those flows, both water and sewerage, which 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.

Beaufort West Municipality should continue to update their IWA water balance models on a monthly basis in order 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. All bulk zone water meters need to be recorded on at least a monthly basis (Meters at reservoirs and pump stations).

Beaufort West: The following areas need to be focused on for the IWA water balance.

- Continue to ensure that all borehole meters, WTW meters, meters at reservoirs and pump stations and meters on bulk supply pipelines are read and recorded on at least a monthly basis.
- Continue to ensure that all borehole meters and meters at reservoirs and on bulk supply pipelines are read and recorded on at least a monthly basis. All bulk water meters to be adequately protected in lockable meter chambers to prevent vandalism and damage to the meters.
- Financial Department needs to ensure that all meters are read and billed on a monthly basis (No estimates). The volume of water of any estimated account needs to be included in the billing system, in order to ensure that the billed metered consumption figures are accurate.
- All "Cashflow" prepaid water meters need to be phased out.
- Swift analysis needs to be carried out in order to identify unmetered erven, erven with a meter, but with zero consumption, erven with very low consumption and erven not included in the billing system.
- Inflow and outflow meter readings at WWTW to be recorded and made available for the WSDP.

Merweville: The following areas need to be focused on for the IWA water balance.

- Continue to ensure that all borehole meters and meters at reservoirs and on bulk supply pipelines are read and recorded on at least a monthly basis.
- Financial Department needs to ensure that all meters are read and billed on a monthly basis (No estimates). The volume of water of any estimated account needs to be included in the billing system, in order to ensure that the billed metered consumption figures are accurate.
- All "Cashflow" prepaid water meters need to be phased out.
- Swift analysis needs to be carried out in order to identify unmetered erven, erven with a meter, but with zero consumption, erven with very low consumption and erven not included in the billing system.
- WWTW flow at the oxidation pond system to be metered.



Nelspoort: The following areas need to be focused on for the IWA water balance.

- Bulk water meters need to be adequately protected in lockable meter chambers.
- Continue to ensure that all bulk water meters are read and recorded on at least a monthly basis.
- Financial Department needs to ensure that all meters are read and billed on a monthly basis (No estimates). The volume of water of any estimated account needs to be included in the billing system, in order to ensure that the billed metered consumption figures are accurate.
- All “Cashflow” prepaid water meters need to be phased out.
- Swift analysis needs to be carried out in order to identify unmetered erven, erven with a meter, but with zero consumption, erven with very low consumption and erven not included in the billing system.
- Faulty flow meter at the main sewer pump station to be repaired and readings to be recorded on a daily basis.

Murraysburg: The following areas need to be focused on for the IWA water balance.

- Continue to ensure that all borehole meters and meters at reservoirs and on bulk supply pipelines are read and recorded on at least a monthly basis.
- Financial Department needs to ensure that all meters are read and billed on a monthly basis (No estimates). The volume of water of any estimated account needs to be included in the billing system, in order to ensure that the billed metered consumption figures are accurate.
- All “Cashflow” prepaid water meters need to be phased out.
- Swift analysis needs to be carried out in order to identify unmetered erven, erven with a meter, but with zero consumption, erven with very low consumption and erven not included in the billing system.
- Faulty flow meter at the main sewer pump station to be repaired and readings to be recorded on a daily basis. Meter readings of the meter at the irrigation pump station at the WWTW to be read and recorded on a daily basis.

NRW and Water Losses:

Beaufort West: The treatment losses at the WTW (5.8% for 23/24) and the bulk water distribution losses (1.1% for 23/24) are at excellent levels. The NRW and Water Losses are however extremely high and above DWS’s NRW target of 30%. It can be noted on the graph below that there were a constant growth in raw water volume and system input volume over the last six financial years, but the billed metered consumption volume decreased over this six year period.

The billed metered consumption figures from the billing system is not accurate, because estimated volumes (Metered connections where the readings were estimated for a specific month) are not recorded in the billing system and the volumes of the “Cashflow” prepaid water meters are also not recorded in the system. It is therefore not possible to accurately calculate the NRW and Water Losses for Beaufort West. The Municipality needs to work towards a NRW target of 30% and water losses target of 25% for Beaufort West. The ILI of 12.35 indicates a bad management system, which requires immediate water loss reduction interventions.

Merweville: The total borehole abstraction volume and the system input volume compares well for Merweville, with only 2.55% bulk distribution losses for the 2023/2024 financial year. The installation of the smart prepaid water meters resulted in a decrease of the raw water volume and the system input volume, which is good. The estimated volumes for the “Cashflow” prepaid water meters were too high during the 2022/2023 financial year, therefore the very low NRW (4.1%) and water losses (3.9%) for the 2023/2024 financial year.

The NRW of 46.5% for the 2023/2024 financial year is above DWS’s NRW target of 30%. The Municipality needs to work towards a NRW target of 30% and water losses target of 25% for Merweville. The ILI of 6.23 indicates a poor management system, which requires attention.



Nelspoort: The treatment losses of 28.9% for the last financial year is high and the Municipality can implement measures to reduce the treatment losses to acceptable levels. The bulk distribution losses is very low, which is excellent. The Municipality started with the installation of smart prepaid water meters, which resulted in a reduction of the raw water and system input volumes, which is good. The NRW of 63.1% for the 2023/2024 financial year is extremely high and above DWS's NRW target of 30%. The Municipality needs to work towards a NRW target of 30% and water losses target of 25% for Nelspoort. The ILI of 6.97 indicates a poor management system, which requires attention.

Murraysburg: The billed metered consumption volume decreased drastically during the last financial year. The NRW therefore increased from 28.85% in 2022/2023 to 93.43% in 2023/2024. The billed metered consumption figures from the billing system is not accurate, because estimated volumes (Metered connections where the readings were estimated for a specific month) are not recorded in the billing system and the volumes of the "Cashflow" prepaid water meters are also not recorded in the system. It is therefore not possible to accurately calculate the NRW and Water Losses for Murraysburg. The Municipality started with the installation of smart prepaid water meters and the phasing out of the "Cashflow" prepaid water meters, which will improve the billed metered consumption volumes.

It is currently not possible to accurately calculate the NRW and Water Losses of the various towns in Beaufort West Municipality, because of inaccurate billed metered consumption volumes from the Financial System, as discussed under Section 5.2 of Topic 5 of the Administration, Information and Comprehensive Overview Report. The following measures need to be put in place to accurately calculate the billed metered consumption volumes for each of the towns.

- Financial Department needs to ensure that all meters are read and billed on a monthly basis (No estimates). The volume of water of any estimated account needs to be included in the billing system, in order to ensure that the billed metered consumption figures are accurate.
- All "Cashflow" prepaid water meters need to be phased out.

TOPIC 6: WATER RESOURCES

Topic C.6.1: Water Resources						
Section	Intervention Required?	% ⁽¹⁾	Solution description as defined by topic situation assessment	% ⁽²⁾	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring % ⁽³⁾
Current Water Sources	Yes	100	Ensure the required authorisations (licences) are in place for all the water resources, as well as the required registrations.	100	Yes	85.7
Additional Sources Available	Yes	100	Augmentation of the groundwater sources in Beaufort West (Karoo National Park)	100	No	71.4
	Yes	100	Refurbishment of vandalized and non-operational boreholes in Beaufort West.	100	No	71.4
Monitoring	Yes	100	Ensure that the key groundwater management functions are implemented. The monitoring data must be analysed by a geohydrologist on an annual basis in order to assess the effects of abstraction and recharge on the boreholes and aquifer. Groundwater monitoring must continue on at least a monthly basis. Monthly monitoring of water levels, water chemistry and abstraction must be conducted by the Municipal staff. Beaufort West Municipality needs to ensure that all electronic data (i.e. dataloggers) are downloaded once quarterly by a geohydrologist. Monitoring data must be annually reviewed by a geohydrologist.	100	No	71.4
Water Quality	Yes	100	Ensure comprehensive operational and compliance wastewater quality monitoring programmes are implemented for all four WWTWs (To ensure proper process control and compliance w.r.t. Authorisation requirements)	100	Partially	78.6
	Yes	100	Ensure comprehensive operational water quality monitoring programmes are implemented for all four systems (Compliance with SANS241:2015 requirements).	100	Partially	78.6
Operation	Yes	100	The quality of industrial effluent discharged into the Municipality's sewer system needs to be monitored, as well as volumetric monitoring at the larger users. Adaptation of the current procedures must be undertaken in accordance with any changes to the wastewater discharge criteria set by 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.	100	No	71.4

Notes: (1) Is this section addressed in the WSDP?



- (2) Were solutions identified for the possible gaps?
- (3) Percentage calculated based on the above two percentages and whether there is an existing project/activity addressing this problem? Does this current listed project/activity address the problem totally? Project/Activity approved by Council as part of WSDP database? Approved by Council in project activity database and part of 5yr IDP cycle projects? Project/Activity listed in 3yr MTEF Cycle?

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

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

The Central Karoo Region experience regular droughts, with limited surface water resources available in the Region. Most of the towns are therefore largely dependent on groundwater resources. Drought restriction measures often needs to be implemented to reduce the water requirements of the towns. WC/WDM measures to lower the extremely high NRW and Water Losses of Beaufort West Municipality and the future water requirements of Beaufort West are critical at this stage. The existing non-operational and vandalised boreholes in Beaufort West need to be put back into operation as soon as possible. The augmentation of the existing water resources with additional groundwater sources are also critical.

Future water requirement projection models were developed for each of the towns within Beaufort West Municipality's Management Area. These models include the future projections up to 2048 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 table below gives an overview of the different future water requirement projections for the various distribution systems.

Table C.6.2: Projected future water requirements of towns						
Distribution System	Model	PROJECTED FUTURE WATER REQUIREMENTS (Ml/a)				
		2028	2033	2038	2043	2048
Beaufort West	2.0% Annual Growth	4 260.685	4 704.141	5 193.751	5 734.321	6 331.154
	3.5% Annual Growth	4 583.322	5 443.548	6 465.228	7 678.662	9 119.842
	WSDP Model	3 841.959	3 955.323	4 078.157	4 210.832	4 353.771
	Yield surplus (+) / shortfall (-) *	-615.383	-728.747	-851.581	-984.256	-1 127.195
	Yield surplus (+) / shortfall (-) **	+1 109.741	+996.377	+873.544	+740.869	+597.929
Merweville	1.0% Annual Growth	70.060	73.634	77.390	81.338	85.487
	2.0% Annual Growth	73.598	81.258	89.716	99.053	109.363
	WSDP Model	66.978	70.082	73.371	76.855	80.546
	Yield surplus (+) / shortfall (-)	+90.072	+86.967	+83.678	+80.195	+76.503
Nelspoort	1.0% Annual Growth	181.936	191.217	200.971	211.222	221.997
	2.0% Annual Growth	191.123	211.015	232.978	257.226	283.999
	WSDP Model	169.571	174.397	179.430	184.678	190.148
	Yield surplus (+) / shortfall (-)	+207.923	+203.097	+198.064	+192.816	+187.346
Murraysburg	1.0% Annual Growth	485.558	510.327	536.358	563.718	592.473
	2.0% Annual Growth	510.076	563.166	621.780	686.496	757.947
	WSDP Model	458.405	478.161	499.071	521.207	544.645
	Yield surplus (+) / shortfall (-) ***	+223.298	+203.542	+182.632	+160.496	+137.059

Notes: * Status Quo, yield from vandalised and non-operational boreholes not available

** All vandalised and non-operational borehole put back into operation

*** Exclude available yield from three Steenwerke boreholes



The table below gives an overview of the years in which the annual water requirements are likely to exceed the safe yields of the various resources for the different systems.

Distribution System	Safe yields of all sources (MI/a)	Annual Growth on 2023/2024 Demand (Low Growth)	Annual Growth on 2023/2024 Demand (High Growth)	WSDP Projection Model
Beaufort West	3 226.576 (Status Quo)	Over (2.0%)	Over (3.5%)	Over
	4 951.700 (All BHs operational)	2035 (2.0%)	2030 (3.5%)	> 2048
Merweville	157.049	> 2048 (1.0%)	> 2048 (2.0%)	> 2048
Nelspoort	377.494	> 2048 (1.0%)	> 2048 (2.0%)	> 2048
Murraysburg	681.703 *	> 2048 (1.0%)	2043 (2.0%)	> 2048

Note: * Exclude available yield from three Steenwerke boreholes.

Beaufort West: The town is at extreme risk of inadequate supply and running out of water. The safe yield from the production boreholes is 47% less (Yield of 1 725 MI/a not available), because of vandalised and non-operational boreholes. The current water requirement of the town of 3 859 MI/a is already exceeding the current available yield of 3 227 MI/a from the Gamka dam and the current production boreholes that are in operation. The existing vandalised and non-operational boreholes need to be put back into operation and the augmentation of the existing groundwater sources with additional boreholes are critical.

The Feasibility Study for Additional Wellfields to supply Beaufort West (Aurecon and GEOS, 20 February 2019) list the following four AOI for the augmentation of the groundwater resources of Beaufort West.

Area of Interest	Expected Yield		Points	Expected Quality (mS/m)	Points	Total Cost (Pipelines and Power)	Points	Total Points	Rank
	l/s	MI/d							
AOI 1: Kamferskraal	10	0.86	4	70 – 400	3	R42 350 000	3	10	5 th
AOI 2: Soutrivier / Aberdeen Road	20	1.73	3	500 – 1500	4	R22 900 000	2	9	4 th
AOI 3: Ryst Kuil	25	2.16	2	130 – 220	2	R45 750 000	4	8	2 nd
AOI 4: KNP	20	1.73	3	70 – 180	1	R20 700 000	1	5	1 st
Combined pipes for AOI 1, 2 and 3	55	4.75	1	70 - 1200	2.5	R90 900 000	5	8.5	3 rd

Each AOI has its own specific challenges relevant to groundwater development namely, but not limited to 1) cost of infrastructure, 2) varying yields, 3) poor groundwater quality and 4) reluctance of private land owners to allow access to their properties. Although the determining factor for selecting an AOI to undergo groundwater development should be hydrogeological potential, the abovementioned challenges will influence the outcome of the decision.

Once the AOI (or combination of AOI) has been selected, groundwater exploration must commence immediately to quantify yield and quality of the chosen AOI. A facilitation team should be formed to guide landowners in the way forward for allowing access to their farms for exploration, and possibly further groundwater development, if exploration results are favourable.

Additional wellfield development cannot be put on hold, as droughts will continue and the population and water demand of Beaufort West, if not regulated, will continue to increase. The four wellfield options and the combination of the wellfields to the east provide medium- and long-term solutions to the current water shortage. If a wellfield is developed successfully, it is recommended that the current town supply boreholes are alternated with the new wellfield/s to allow the town aquifers to recover.

Merweville: New boreholes were recently put into operation and the safe yields from the existing production boreholes are adequate to meet the town's future water requirements.

Nelspoort: The safe yields from the existing three production boreholes and the additional surface water supply from the Sout River are adequate to meet the town's future water requirements.

Murraysburg: New boreholes were recently put into operation and the safe yields from the existing production boreholes are adequate to meet the town's future water requirements.



The DWS is currently busy with the updating of the All Towns Reconciliation Strategies for the Western Cape, but updated strategies for Beaufort West Municipality are not yet available. The table below gives an overview of the recommended potential future water resources, as included in the February 2015 All Towns Reconciliation Strategies, for the towns in Beaufort West Municipality.

Table C.6.5: Potential future water resources for the various towns (Recommended summary options of DWS's All Towns Reconciliation Strategies, February 2015)	
Distribution System	Recommended Summary Options
Beaufort West	<p>The current water supply will meet the future water requirements for all growth scenarios if the implementation of the WC/WDM Strategy is successful. The following interventions are recommended for implementation, in order of priority and implementation sequence:</p> <ul style="list-style-type: none"> Full implementation of the WC/WDM Strategy. Integration of recently drilled and developed boreholes. Development and implementation of integrated operating rules for the dam, the wellfields and the reclamation scheme to possibly increase the yield of the whole system. Further incremental groundwater development.
Merweville	<p>The yields from the existing groundwater resources are adequate to meet the future growth scenarios. The existing water losses and NRW for the town are however extremely high, and there should be a major drive to reduce the existing losses. The following interventions are recommended for implementation, in order of priority and implementation sequence:</p> <ul style="list-style-type: none"> Full implementation of the WC/WDM Strategy measures. Further Groundwater development. Artificial recharge of groundwater from Vanderbijlskraal River.
Nelspoort	<p>The current water sources have adequate supply to cater for the medium and longer-term future water requirements. However existing water losses and NRW for the town are extremely high and there should be a major drive to reduce existing losses. The following interventions are recommended for implementation, in order of priority and implementation sequence:</p> <ul style="list-style-type: none"> Full implementation of the newly developed WC/WDM Strategy. Incremental groundwater development. Further abstraction from the Sout River.
Murraysburg	<p>If the implementation of the Water Conservation and Water Demand Management Strategy measures is successful to reduce water consumption by more than 20%, the current yield should be adequate to cater for the future water requirements. The following interventions are recommended for implementation, in order of priority and implementation sequence:</p> <ul style="list-style-type: none"> Implement WC/WDM Strategy measures. Compile a drought plan, monitor abstraction and recharge against pre-set warning points and manage the borehole abstraction. If and when needed a further borehole can be developed.

Water Quality: 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, are summarised below.

Table C.6.6: Minimum Monitoring Frequency for Process Risk Indicators (SANS241-2:2015: Table 1)			
Determinand	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 determinands 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.			



Beaufort West Municipality is committed to continue with their current Operational and Compliance Water Quality Sampling Programmes for all their formal schemes and to implement the additional recommended sampling, as indicated in this WSDP. The Municipality will further continue to load all the water quality compliance sample results for the various distribution systems onto DWS's IRIS on a monthly basis.

It is recommended that raw water quality samples also be collected for each of the production boreholes on at least an annual basis.

As safeguard against water borne diseases it is strongly recommended that Beaufort West Municipality continue to ensure that all water used for human consumption are adequately disinfected by chlorination or other methods.

Effluent Quality: The current operational and compliance monitoring of the effluent at all the WWTWs is not adequate and the current sampling programmes does not meet the minimum requirement of DWS as stipulated in the Green Drop certification criteria. Limited operational sampling is only done at the Beaufort West WWTW. Only Microbiological (Faecal Coliforms) compliance sampling is done by an external accredited laboratory on a monthly basis for the Beaufort West and Murraysburg WWTWs.

Industrial Consumers: Beaufort West Municipality can promote WDM activities at the wet industrial consumers in order for them to potentially lower their current water demand by means of improved practices or reuse of waste water. The revenue could potentially decrease as a result of re-use practices.

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

Industrial consumers that discharge industrial effluent into the Municipality's sewer system is not yet monitored with regard to quantity and quality. The quality and volume of industrial effluent discharged into the sewer system need to be monitored by the Municipality, in order to determine whether the quality comply with the standards and criteria. It is also 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. The Municipality needs to ensure that all industrial consumers 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. 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.

Beaufort West Municipality is committed to ensure that no industrial effluent is discharged into the sewer system unless it complies with the required standards and criteria.

TOPIC 7: FINANCIAL

A Financial Recovery Plan was approved by Council on 23 March 2022. Financial recovery plans are prepared for municipalities where interventions are implemented in terms of Section 139, read together with Section 142, of the MFMA. They are largely prepared for municipalities under financial distress.

The mandatory FRP will be used as an instrument to guide the municipality in addressing the financial crisis in the municipality as well as to ensure that the municipality regains its financial health within the shortest timeframe whilst ensuring that all issues which adversely affect the financial health of the municipality are comprehensively addressed. This will allow the Municipality to give effect to the financial recovery plan and the overall recovery process. The strategic objective of this financial recovery plan is to address the current financial distress by focusing on improving the short-term financial liquidity of the municipality and by improving the long-term financial sustainability of the municipality.



The overall financial situation of the Municipality is not sustainable and the municipality need to develop a radical revenue enhancement strategy that will be implemented to get it out of its financial crises. The 2024/2025 IDP include the following Objectives and Interventions (Financial Management).

Objectives	Intervention
To ensure financial sustainability through improved billing system, improved revenue collection and identification of additional revenue sources	<ul style="list-style-type: none"> • Ensure correct accountholders are billed monthly and that the municipal accounts are reaching the customers who are responsible for payment. • Identify debtors that can afford to pay and enforce the Credit Control and Debt Collection Policy. • To ensure completeness, correctness and validity of the General Valuation Roll and supplementary valuations. • The reduction of outstanding debtors is critical for financial viability and liquidity, by applying strict credit control measures religiously and without fail. • To improve quality of data, financial reporting and other decision-making processes and customer satisfaction. • Installation of prepaid meters to ensure maximization of revenue and reduced distribution losses. • To ensure the re-registering of all indigent consumers before the end of the financial year. • Develop and submit business plans for government grant funding programmes to optimize grant funding programmes.
Progress from Qualified Audit opinion to Unqualified or Clean Audit outcome	<ul style="list-style-type: none"> • To ensure compliance with applicable laws and regulations. • Maintain accurate financial information and record management. • To ensure integrated asset management system through the value chain of recording and uploading of asset in an automated method. • Create an efficient, effective and accountable administration and functional Governance Structures. • To ensure the application and implementation of SCM processes to derive value for money and address irregular, fruitless and wasteful expenditure.

The FRP list the following key issues:

- **Budget Management:** To ensure that the municipality tables a funded budget and has sufficient revenue baseline to address its budget deficit.
- **Trading Tariffs:** Need to ensure that all services reflect a surplus in the near future and the cost of delivering a service is fully recovered and allows for maintenance of assets linked to that service.
- **Revenue Improvement:** Ensure that the billing system fully accounts for all properties within the municipality and that all services are correctly billed at a correct tariff.
- **Expenditure and Creditor Management:** Improve the days of paying outstanding creditors and ensure that creditors are paid within 30 days in line with section 65(2)(e) of the MFMA.

Expenditure:

Operational: The future planned operational expenditure by type for Beaufort West Municipality, as included in the 2024/2025 MTREF Budget, is indicated in the table below.

Expenditure Items	% of total 2023/2024 Expenditure	2023/2024 Full Year Forecast	2024/2025 Budget	2025/2026 Budget	2026/2027 Budget
Employee related costs	29.2%	R126 707 000	R138 817 000	R143 484 000	R148 463 000
Remuneration of Councillors	1.6%	R6 806 000	R7 133 000	R7 475 000	R7 812 000
Bulk purchase – Electricity	21.5%	R93 450 000	R105 318 000	R121 853 000	R127 336 000
Inventory Consumed	5.5%	R23 764 000	R25 503 000	R26 749 000	R28 388 000
Debt Impairment	14.8%	R64 527 000	R75 382 000	R80 577 000	R73 383 000
Depreciation and Asset Impairment	6.2%	R26 805 000	R29 266 000	R30 217 000	R31 117 000
Interest	0.5%	R2 252 000	R1 847 000	R1 392 000	R262 000
Contracted Services	7.0%	R30 268 000	R27 528 000	R34 443 000	R46 418 000
Transfers and Subsidies	0.0%	R0	R0	R0	R0
Irrecoverable debts written off	4.8%	R20 832 000	R0	R0	R0



Table C.7.2: Expenditure items by type, as included in the 2024/2025 budget					
Expenditure Items	% of total 2023/2024 Expenditure	2023/2024 Full Year Forecast	2024/2025 Budget	2025/2026 Budget	2026/2027 Budget
Operational costs	8.9%	R38 630 000	R38 604 000	R40 616 000	R38 323 000
Losses on disposal of Assets	0.0%	R0	R0	R0	R0
Other Losses	0.0%	R0	R0	R0	R0
Total	100.0%	R434 041 000	R449 398 000	R486 807 000	R501 502 000

Source: Medium Term Revenue and Expenditure Framework for Beaufort West 2024/2025: Table A4 – Budgeted Financial Performance (Revenue and Expenditure)

Maintenance activities have been increasingly focused on reactive maintenance as a result of the progressive deterioration and failure of old infrastructure. Consequently, there has been dilution of preventative maintenance of other infrastructure. Expenditure on repairs and maintenance does not keep track with the increase in asset values as well as the ageing of the infrastructure.

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

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

The recommendations for Beaufort West Municipality, with regard to their Operational Budgets, are as follows:

- Develop an 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 have to be rectified and ring-fenced into an asset replacement fund, as well as additional budget requirements above inflation for infrastructure development.
- The new depreciation charges will have to form part of the operating budget and subsequent tariffs, linked to a ring-fenced asset replacement fund.
- It is critical for Beaufort West Municipality to ensure that sufficient funding is allocated towards an asset replacement fund, in order to ensure adequate rehabilitation and maintenance of the existing water and sewerage infrastructure.
- Water services operational surpluses have to be allocated to essential water services requirements in the future.
- Beaufort West Municipality needs to ensure that their Credit Control and Debt Collection measures are strictly enforced.

Capital: The future estimated capital expenditure per functional classification are summarised in the table below.

Table C.7.3: Estimated Capital Expenditure per Functional Classification of Beaufort West Municipality's future capital budget				
Capital Expenditure Standard	2023/2024 Full Year Forecast	2024/2025 Budget	2025/2026 Budget	2026/2027 Budget
Executive and Council	R0	R0	R0	R0
Finance Administration	R1 707 000	R500 000	R0	R0
Community and social Services	R77 000	R1 304 000	R1 052 000	R870 000
Sports and Recreation	R2 422 000	R4 666 000	R1 967 000	R0
Public Safety	R0	R0	R0	R0



Table C.7.3: Estimated Capital Expenditure per Functional Classification of Beaufort West Municipality's future capital budget				
Capital Expenditure Standard	2023/2024 Full Year Forecast	2024/2025 Budget	2025/2026 Budget	2026/2027 Budget
Planning and Development	R164 000	R0	R0	R0
Road Transport	R5 985 000	R0	R11 665 000	R9 004 000
Energy Sources	R0	R6 480 000	R3 210 000	R7 893 000
Water Management	R1 074 000	R2 174 000	R0	R0
Waste Water Management	R216 000	R0	R0	R2 706 000
Waste Management	R4 586 000	R10 451 000	R0	R0
Total Capital Expenditure	R16 231 000	R25 575 000	R17 894 000	R20 473 000

Source: Medium Term Revenue and Expenditure Framework for Beaufort West 2024/2025: Table A5 - Capital Expenditure by Vote, Functional Classification and Funding Source

The Opening Cost of the water and sewerage infrastructure that will need to be replaced over the next five years (RUL < 5 yrs) is R28.578 million. The asset renewal needs for the water infrastructure assets over the next ten years is R2.315 million per year. The reinvestment required is R4.578 million in the first five years and R18.570 million in the second five-year period. The age of 48.29% of the water infrastructure assets is greater than twenty years. About 5.68% of the water supply infrastructure is in a poor or very poor condition and the condition backlog is in the order of R8.154 million. The bulk of the backlog is made up of reservoir assets.

The asset renewal needs for the sewerage infrastructure assets over the next ten years is R3.084 million per year. The reinvestment required is R24.000 million in the first five years and R6.842 million in the second five-year period. The age of 64.01% of the sewerage infrastructure assets is greater than twenty years. About 2.99% of the sewerage infrastructure is in a poor or very poor condition and the condition backlog is in the order of R3.163 million. The bulk of the backlog is made up of the sewer pump stations and the WWTWs.

These values are based on the Opening Cost of the water and sewerage infrastructure currently included in the Asset Register.

The extent to which each type of water and sewerage asset portfolio has been consumed are summarised under Topic 3 in the Tables under Section 3.1.1 of the Administration, Information and Comprehensive Overview Report. The infrastructure components with low percentage figures (% CV/OC) 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 service levels that can be provided in Beaufort West Municipality.

The recommendations for Beaufort West Municipality, with regard to 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 once every five years and 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 in order to postpone additional capital investment for as long as possible, both from the water availability perspective as well as from the treatment of increased effluent volumes. The costs of physical water loss, the capital requirements for new water resources infrastructure, and the constraints of poor water availability on water dependent economic growth means that WC/WDM is a critical management priority for stretching the financial resources of the Municipality. WC/WDM is almost always a more cost-effective solution than the implementation of new infrastructure, and no new infrastructure should be developed until unauthorized water has been reduced to manageable volumes. Beaufort West Municipality's current NRW and Water Losses are extremely high and at unacceptable levels.
- 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, in order to improve the Municipality's own funding sources, over and above the Grants received from National and Provincial Government. The Municipality also needs to continue to actively implement their Customer Care, Credit Control and Debt Collection and Indigent Policies in order to minimize the percentage of non-payment for municipal services.
- To identify all possible sources of external funding over the next five financial years to assist Beaufort West Municipality to address the bulk water and sewerage infrastructure backlogs and the extremely high NRW and water losses that exist in the various towns as indicated in the tables under Topic 3 and Topic 5.
- Develop IAMPs for all water and sewerage infrastructure, which will indicate the real replacement values, the service life of the assets and the funds required to provide for adequate asset replacement. The renewals burden is set to increase sharply over the next 20 years and it is therefore important for Beaufort West Municipality to commit to a substantial and sustained programme of capital renewal works. 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:

Operational: The future planned revenue by source for Beaufort West Municipality, as included in the 2024/2025 MTREF Budget, is as follows.

Revenue Item	2023/2024 Full Year Forecast	2024/2025 Budget	2025/2026 Budget	2026/2027 Budget
Service Charges - Electricity	R108 534 000	R120 473 000	R136 133 000	R142 398 000
Service Charges - Water	R13 718 000	R20 853 000	R22 198 000	R23 529 000
Service Charges – Waste Water Management	R23 340 000	R24 740 000	R26 225 000	R27 798 000
Service Charges – Waste Management	R15 045 000	R16 399 000	R17 875 000	R19 483 000
Sale of Goods and Rendering of Services	R795 000	R942 000	R1 017 000	R1 095 000
Agency Services	R1 606 000	R1 766 000	R1 945 000	R2 062 000
Interest earned from Receivables	R11 209 000	R11 992 000	R12 711 000	R13 474 000
Interest earned from Current and Non-Current Assets	R2 115 000	R2 221 000	R2 336 000	R2 406 000
Rental from Fixed Assets	R1 838 000	R2 022 000	R2 143 000	R2 272 000
Licences or Permits	R298 000	R316 000	R335 000	R355 000
Operational Revenue	R1 279 000	R1 351 000	R1 422 000	R1 432 000
Property Rates	R48 421 000	R55 152 000	R58 589 000	R62 104 000
Fines, penalties and forfeits	R70 464 000	R73 189 000	R80 508 000	R85 338 000
Licences or Permits	R192 000	R203 000	R216 000	R228 000
Transfers and subsidies - Operational	R101 752 000	R102 942 000	R110 994 000	R124 485 000
Interest	R3 107 000	R3 449 000	R3 655 000	R3 875 000
Operational Revenue	R32 926 000	R35 832 000	R37 982 000	R40 261 000
Other Gains	R0	R25 587 000	R25 587 000	R0
Total	R436 639 000	R499 429 000	R541 871 000	R552 595 000

Source: Medium Term Revenue and Expenditure Framework for Beaufort West 2024/2025: Table A4 – Budgeted Financial Performance (Revenue and Expenditure)

Capital: The average capital expenditure over the last three financial years were R13.831 million per year for water infrastructure and R0.102 million per year for sewerage infrastructure. Capital funding will have to increase substantially if existing service levels are to be sustained, which has to be the goal. In this regard Beaufort West Municipality's own funding, as well as grant funding must significantly exceed inflation. Other possible sources of funding and innovative funding mechanisms have to be explored.



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

Table C.7.5: Sources of funding for the future capital budgets of Beaufort West Municipality				
Capital Funding Source	2023/2024 Full Year Forecast	2024/2025 Budget	2025/2026 Budget	2026/2027 Budget
National Government	R12 221 000	R19 279 000	R16 593 000	R18 589 000
Provincial Government	R1 847 000	R3 478 000	R0	R0
District Municipality	R0	R0	R0	R0
Transfers and Subsidies	R318 000	R0	R0	R0
Borrowing	R0	R0	R0	R0
Internally generated funds	R1 844 000	R2 818 000	R1 302 000	R1 884 000
Total Capital Funding	R16 230 000	R25 575 000	R17 895 000	R20 473 000

Source: Medium Term Revenue and Expenditure Framework for Beaufort West 2024/2025: Table A5 - Capital Expenditure by Vote, Standard Classification and Funding

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.

Beaufort West Municipality's current five block step water tariff structure does not adequately promote the efficient use of water by consumers or discourage the wastage of water. The tariffs for the higher consumption blocks are only a little bit higher than the tariffs for the lower consumption blocks, which are not adequate. 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 has to be optimally managed. The increase in the price of electricity and chemicals for purification has contributed to the cost of delivering the service.

The table below gives some comments on the specific blocks, with regard to Beaufort West Municipality's residential block stepped tariff structure, for the various years for water services.

Table C.7.6: Comments on the Municipality's residential block stepped water tariff structure						
Block (kl/month)	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	Comments
0 - 6	R13-38	R14-32	R15-18	R16-09	R17-06	Free Basic Water
7 – 15	R15-36	R16-44	R17-43	R18-48	R19-59	Low volume use
16 – 25	R17-53	R18-76	R19-89	R21-08	R22-34	Typical use volume, including limited garden irrigation
26 – 35	R18-43	R19-72	R20-90	R22-18	R23-51	Above average use, including garden irrigation
36 - 70	R23-04	R24-65	R26-13	R27-72	R29-38	Wasteful use and/or severe garden irrigation
> 70						Significant waste and/or unnecessary garden irrigation



The water tariffs of George Municipality, Drakenstein Municipality and Overstrand Municipality for the 2022/2023 financial year and their block stepped water tariff structures, that adequately promote the efficient use of water, are indicated in the table below.

George Municipality		Drakenstein Municipality		Overstrand Municipality	
Block (kl/month)	Rand per Kl	Block (kl/month)	Rand per Kl	Block (kl/month)	Rand per Kl
0 - 6	R0-00	0 - 6	R5-99	0 – 6	R6-38
6 - 15	R19-44	7 - 10	R10-63	7 – 18	R13-08
16 - 20	R22-40	11 - 15	R15-25	19 – 30	R21-22
21 - 30	R29-11	16 - 30	R19-80	31 – 45	R32-68
31 - 50	R36-48	31 - 45	R27-64	46 – 60	R42-43
51 - 100	R44-98	46 - 55	R58-42	> 60	R56-58
> 100	R76-67	> 55	R87-63		

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

- Maintain a rising block tariff structure.
- Keep number of blocks in the tariff to a minimum. One block to address free basic water (the first step) and another to address the “cut-off” volume where consumers are discouraged to use water above this monthly volume (highest block) are required. In addition another three blocks could be used to distinguish between low users, typical use of high water use. Six blocks in a tariff often make good sense, as indicated in Table C.7.6.
- The volumetric steps should be kept the same for all the areas within Beaufort West Municipality's Management Area.
- The cost of water in the maximum step should severely discourage use in this category. The volumetric use for the highest category could be 60 kl/month, above which residential water use could be considered to be wasteful or unnecessary. Garden use requiring in excess of this volume should be reduced in accordance with xeriscape practices.

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 of time.

Municipalities are urged to design an Inclining Block Tariff (IBT) 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.

In light of 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 sewage tariffs of Beaufort West Municipality are as follows:

- Beaufort West Municipality will continue to re-evaluate the tariffs they charge for their water and sanitation services on an annual to ensure that all the O&M expenditure for water and sanitation services are always



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 wastewater. Beaufort West Municipality should note that revenue could potentially decrease as a result of reuse practices.
- The current water tariff codes can be further improved to adequately differentiate between the different types of consumers and their water usage. The Municipality can investigate the possibility to uniquely describe the “Municipal” water usage with a distinction between the different user types, for example parks, office usage, fire-fighting, etc.
- A financial analysis needs to be done of the current water and sanitation tariffs in order to determine how the tariffs can be adjusted to better discourage the wasteful or inefficient use of water and still ensure adequate income for the municipality. The cost of water in the highest category should severely discourage use in this category, above which residential water use could be considered to be wasteful or unnecessary.
- A financial analysis needs to be done to determine if the Municipality can do away with the current fix sewage tariff structure and introduce a percentage of water usage as a flat charge rate for sanitation, if financially viable. 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, for indigent registered households. This will also further deter wasteful water use.
- Beaufort West 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 discharge into Beaufort West 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 Beaufort West Municipality to recalculate their treatment costs annually, in order to ensure that there is no under or over recovery of costs from industrial consumers.

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.

Beaufort West Municipality is committed to actively implement their Credit Control and Debt Collection By-law in order to reduce the percentage of non-payment by their consumers even further.

The Engineering Department needs to work with the Finance Department in order to ensure that all water used is metered, which include the free basic water, unbilled metered consumption, unbilled unmetered consumption and also the water used for irrigation purposes on the parks. Beaufort West Municipality is committed to ensure that all connections providing an uncontrolled volume of water supply are metered and that tariffs are applied in proportion to water use.

It is recommended that a detail Swift Analysis be done of the Treasury data of Beaufort West Municipality, in order to identify the following for each of the systems.

- Treasury records without GIS link;
- Identified unmetered erven included in the Treasury data;
- Developed erven with a meter, but with zero consumption;
- Developed erven with a meter, but with consumption less than 0.1 kl/d; and
- Developed erven with a substantial increase or decrease in water demand.



TOPIC 8: WATER SERVICES INSTITUTIONAL ARRANGEMENTS AND CUSTOMER SERVICES

Sections 12 and 13 of the Water Services Act (Act No 108 of 1997) place a duty on WSAs to prepare and maintain a WSDP, as part of the process of preparing an IDP. The DWS has developed a new eWSDP website to assist WSAs with the WSDP process and to provide a framework for the capturing of the data. The WSDP of Beaufort West Municipality needs to be updated regularly.

The Municipality also needs to report annually and in a public way on progress in implementing the plan (WSDP Performance- and Water Services Audit Report), as part of Beaufort West Municipality's Annual 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 Plans for the various WTWs and water distribution systems and the W₂RAPs for the WWTWs and sewer drainage networks (once compiled) need to be updated regularly. Updated WTW and WWTW Process Audits were compiled during the 2023/2024 financial year.

The 2008 Water and Sewer Master Plans and the updated 2021 High Level Water Master Plan summarise the projects (Master Plan Items) necessary in order to cope with the increased future demands and developments within the Beaufort West Municipality's systems. The Water and Sewer Master Plans need to be updated more regularly.

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

It is important for Beaufort West Municipality to classify all WTW and operators along the lines of the new Regulation 3630 requirements 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 and the new Regulation 3630 requirements.

The current number of Process Controllers at each of the WTWs and the required number of Process Controllers are included in Table 8.1.3.2 of Topic 8 of the Administration, Information and Comprehensive Overview Report. Additional Process Controllers need to be appointed from some of the WTWs, as indicated in the table.

The Occupational Health and Safety Act contain provisions directing employers to maintain a safe workplace and to minimize the exposure of employees and the public to workplace hazards. It is therefore important for Beaufort West Municipality to compile a Legal Compliance Audit of their WTWs, which will provide the management of Beaufort West Municipality with the necessary information to establish whether the Municipality is in compliance with the legislation or not. **It is further recommended that Beaufort West Municipality arrange for chlorine audits to be done at all their disinfection facilities, in order to identify any potential shortcomings.**

Beaufort West Municipality has a Performance Management System in place. The performance indicators as included in the SDBIP are regularly reviewed in order 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.

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



Beaufort West 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 Management System allows 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 period.

SECTION D: WATER SERVICES OBJECTIVES AND STRATEGIES

The water services strategies presented below were derived from the 2024/2025 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.

2022-2027 WATER SERVICES DEVELOPMENT PLAN: EXECUTIVE SUMMARY



Table D.1: Strategies, Objectives and Key Performance Indicators for Beaufort West Municipality									
Nr	Objective / Strategy	Key Performance Indicator	Baseline 2023/2024	Linked Project	FY2024/25	FY2025/26	FY2026/27	FY2027/28	FY2028/29
Topic 1: Settlement Demographics and Public Amenities									
	Implemented by other Department	-	-	-	-	-	-	-	-
Topic 2: Service Levels Profile									
TL6	Provide, maintain and expand basic services to all people in the municipal area.	Number of formal residential properties that receive piped water (credit and prepaid water) that is connected to the municipal water infrastructure network and which are billed for water or have prepaid water meters as at 30 June.	16 307	Part of O&M Budget	Targets still to be set	Targets still to be set	Targets still to be set	Targets still to be set	Targets still to be set
TL8	Provide, maintain and expand basic services to all people in the municipal area.	Number of formal residential properties connected to the waste water sanitation/sewerage network for sewerage service, irrespective of the number of closets (toilets) which are billed for sewerage as at 30 June	16 307	Part of O&M Budget	Targets still to be set	Targets still to be set	Targets still to be set	Targets still to be set	Targets still to be set
TL10	Provide, maintain and expand basic services to all people in the municipal area.	Provide free basic water to active indigent households as defined in paragraph 9(1) of the Municipality's Credit Control and Debt Collection Policy as at 30 June 2024	9 658	Part of O&M Budget	Targets still to be set	Targets still to be set	Targets still to be set	Targets still to be set	Targets still to be set
TL12	Provide, maintain and expand basic services to all people in the municipal area.	Provide free basic sanitation to active indigent households as defined in paragraph 9(1) of the Municipality's Credit Control and Debt Collection Policy as at 30 June 2024	9 658	Part of O&M Budget	Targets still to be set	Targets still to be set	Targets still to be set	Targets still to be set	Targets still to be set
New	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).	-	BW2425006	-	-	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)
New	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).	-	BW2425007	-	-	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)
New	Provision of communal taps to households in informal areas based on the standard of 1 water point to 25 households.	Number of communal taps installed in relation to the number of informal households.	-	BW2425004	-	-	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
New	Provision of communal toilet facilities to households in informal areas based on the standard of 1 toilet to 5 households.	Number of toilet structures provided in relation to the number of informal households.	-	BW2425005	-	-	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.

2022-2027 WATER SERVICES DEVELOPMENT PLAN: EXECUTIVE SUMMARY



Table D.1: Strategies, Objectives and Key Performance Indicators for Beaufort West Municipality									
Nr	Objective / Strategy	Key Performance Indicator	Baseline 2023/2024	Linked Project	FY2024/25	FY2025/26	FY2026/27	FY2027/28	FY2028/29
Topic 3: Water Services Asset Management									
	Sustainable, safe and healthy environment	95% of the approved project budget spent on the upgrade of existing irrigation pump station at the Waste Water Treatment Works in Beaufort West by 30 June 2024	95%	BW2425003	95%	95%	95%	-	-
New	Ensure adequate storage capacity	Ensure adequate storage capacity for all towns (At least 48hrs AADD)	-	Various Projects	-	-	All towns with storage capacity above 48 hrs AADD	All towns with storage capacity above 48 hrs AADD	All towns with storage capacity above 48 hrs AADD
New	Implement projects included in the Water Master Plan	Ensure adequate water pump station and water reticulation capacity.	-	Various Projects	-	-	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.
New	Implement projects included in the Sewer Master Plan	Ensure adequate sewer pump station and sewer drainage network capacity.	-	Various Projects	-	-	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.
Topic 4: Water Services Operation and Maintenance									
TL29	Sustainable, safe and healthy environment	95% of water samples in Beaufort West jurisdiction area comply with SANS241 micro biological indicators	95%	Part of O&M Budget	95%	95%	95%	95%	95%
New	Implement recommendations from detail WTW Process Audits.	% Of recommendations, as included in the WTW Process Audits, implemented.	-	Various Projects	-	-	50% of recommendations implemented	70% of recommendations implemented	90% of recommendations implemented
New	Implement recommendations from detail WWTW Process Audits.	% Of recommendations, as included in the WWTW Process Audits, implemented.	-	Various Projects	-	-	50% of recommendations implemented	70% of recommendations implemented	90% of recommendations implemented
New	Implement recommendations as included in the Improvement / Upgrade Plan of the Water Safety Plan	% Of recommendations, as included in the Improvement / Upgrade Plan of the Water Safety Plan, implemented.	-	BW2425010	-	-	50% of recommendations implemented	70% of recommendations implemented	90% of recommendations implemented
New	Implement recommendations as included in the Improvement / Upgrade Plan of the W ₂ RAPs.	% Of recommendations, as included in the Improvement / Upgrade Plan of the W ₂ RAPs, implemented.	-	BW2425011	-	-	50% of recommendations implemented	70% of recommendations implemented	90% of recommendations implemented
New	Quality of final effluent comply with authorisation limits for final effluent.	% Compliance with WWTW final effluent authorisations	-	Part of O&M Budget	-	-	70%	80%	90%

2022-2027 WATER SERVICES DEVELOPMENT PLAN: EXECUTIVE SUMMARY



Table D.1: Strategies, Objectives and Key Performance Indicators for Beaufort West Municipality									
Nr	Objective / Strategy	Key Performance Indicator	Baseline 2023/2024	Linked Project	FY2024/25	FY2025/26	FY2026/27	FY2027/28	FY2028/29
New	Water Quality sampling programme complies with requirements.	Water Quality Sampling Programme complies with the minimum SANS241:2015 monitoring frequency for process indicators.	-	BW2425014	-	-	90%	95%	100%
New	Ensure adequate budget for the O&M of the existing water and sewerage infrastructure	Ensure a budget of at least 1.5% of the total value of the water and sewerage assets is allocated towards the annual O&M of the systems.	-	Part of O&M Budget	-	-	A budget of 1.5% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.	A budget of 1.5% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.	A budget of 1.5% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.
New	Ensure adequate budget for the replacement of old water and sewerage infrastructure	Ensure a budget of at least 2% of the total value of the water and sewerage assets is allocated towards the replacement of existing infrastructure per annum.	-	Various Projects	-	-	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.
New	Reporting on water quality and wastewater quality compliance percentages	Report at least annually on the percentage of water quality and wastewater quality compliance.	-	Part of O&M Budget	-	-	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									
TL19	Uphold sound financial management principles and practices.	Limit unaccounted for water quarterly to less than 25% during 2023/2024 [(Number of kilolitres water purchased or purified – number of kilolitres water sold (including free basic water) / number of kilolitres water purchased or purified x 100]	30%	Part of O&M Budget	< 30%	< 30%	< 30%	< 30%	< 30%
Topic 5: Conservation and Demand Management: Water Balance									
New	Detail IWA Water Balances for all the systems and monthly WTW flows for all the treatment plants.	Ensure all bulk water is metered at source, at WTW (incoming and outgoing) and at all bulk storage reservoirs and the meters are read and recorded on at least a monthly basis.	-	BW2425016 BW2425017 BW2425018 BW2425019	-	-	90% Compliance	95% Compliance	100% Compliance
New	Monthly WWTW flows for all the treatment plants.	Ensure all incoming flow and outgoing flow at 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.	-	BW2425016 BW2425017 BW2425018 BW2425019	-	-	90% Compliance	95% Compliance	100% Compliance
Topic 6: Water Resources									
New	Implementation of Groundwater Management Programme	Ensure groundwater management programme for boreholes are implemented and raw water quality is monitored at least annually.	-	BW2425013	-	-	Implement Groundwater Management Programme and monitor raw water quality at least annually.	Implement Groundwater Management Programme and monitor raw water quality at least annually.	Implement Groundwater Management Programme and monitor raw water quality at least annually.

2022-2027 WATER SERVICES DEVELOPMENT PLAN: EXECUTIVE SUMMARY



Table D.1: Strategies, Objectives and Key Performance Indicators for Beaufort West Municipality									
Nr	Objective / Strategy	Key Performance Indicator	Baseline 2023/2024	Linked Project	FY2024/25	FY2025/26	FY2026/27	FY2027/28	FY2028/29
New	All water sources are authorised.	% of Abstraction from sources registered and authorised by the DWS.	-	Part of O&M Budget	-	-	75% Compliance	85% Compliance	100% Compliance
New	Ensure adequate yield and allocations from water resources to meet the projected future water requirements.	Ensure yields and allocations are adequate to meet the projected five year water requirements for all systems.	-	BW2425001 BW2425040	-	-	100% Adequate supply to meet water requirements for all systems	100% Adequate supply to meet water requirements for all systems	100% Adequate supply to meet water requirements for all systems
New	Monitoring of industrial consumers.	% Monitoring of effluent discharged by industrial consumers (Quantity and Quality) and charged according to the quality of effluent discharged by them.	-	Part of O&M Budget	-	-	50% Of all Industrial Consumers monitored w.r.t. quality and quantity of effluent discharged by them	70% Of all Industrial Consumers monitored w.r.t. quality and quantity of effluent discharged by them	90% Of all Industrial Consumers monitored w.r.t. quality and quantity of effluent discharged by them
Topic 7: Financial									
	Implemented by other Department	-	-	-	-	-	-	-	-
Topic 8: Institutional Arrangements and Customer Care									
New	Ensure adequate Process Controllers at the WTWs (Regulation 3630)	% Compliance w.r.t the number of existing Process Controllers at the WTWs and the required number of Process Controllers	-	Part of O&M Budget	-	-	WTWs meeting the requirements, w.r.t. the number of Process Controllers per shift.	WTWs meeting the requirements, w.r.t. the number of Process Controllers per shift.	WTWs meeting the requirements, w.r.t. the number of Process Controllers per shift.
New	Ensure adequate Process Controllers at the WWTWs (Regulation 3630)	% Compliance w.r.t the number of existing Process Controllers at the WWTWs and the required number of Process Controllers	-	Part of O&M Budget	-	-	50 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	70 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	90 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.



SECTION E: WATER SERVICES MTEF PROJECTS

The draft 2024/2025 Water Services Medium-Term Expenditure Framework (MTEF) projects are presented below and outline the water services projects which might be funded for implementation within the next three financial years. Table E.2a provides the projects identified for implementation in FY2024/25, Table E.2b provides the projects identified for implementation in FY2025/26 and Table E.2c provides the projects identified for implementation in FY2026/27.

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

The summary of the MTEF water services projects are indicated in the table below.

Table E1: Summary of MTEF Projects								
Project Main Category	FY2024/25		FY2025/26		FY2026/27		MTEF Total	
	Nr	Value (R'000)	Nr	Value (R'000)	Nr	Value (R'000)	Nr	Value (R'000)
Water Projects	2	R2 174	0	R0	0	R0	2	R2 174
Sanitation Projects	0	R0	0	R0	1	R2 706	1	R2 706
Combined Water & Sanitation Projects	2	R2 174	0	R0	1	R2 706	3	R4 879

2022-2027 WATER SERVICES DEVELOPMENT PLAN: EXECUTIVE SUMMARY



Nr	Project Reference Number (Dept)	Project Name	Description	Project Driver	Main Category "W" or "S"	Sub Category	Component type	Project Budget / Funding Sources										MTEF Project Source		
								Prev spent FY2023/24	Budget	FY2024/25									Total Cost	
										Own	MIG	RBIG	WSG	WCED	MWIG	Other				
1. Infrastructure Projects								R0	R0									R0		
									R0										R0	
2. Source Development Projects								R0	R1 217										R1 217	
	BW2425001	Repairs to vandalized switchgear for critical boreholes	Vandalised boreholes to be repaired	Refurbishment of boreholes (Vandalism)	Water	Sources	Boreholes		R1 217		R1 217							R1 217		
									R0											
3. Demand Management projects								R0	R0										R0	
									R0										R0	
4. O&M Commitments								R0	R957										R957	
Operations									R957		R957								R957	
	BW2425002	New Telemetric System	Upgrade telemetric systems	Management and monitoring of water usage	Water	Other	Monitoring		R0									R0		
Maintenance									R0											
									R0										R0	
5. Institutional								R0	R0										R0	
									R0										R0	
6. Water Services Programmes								R0	R0										R0	
Awareness and WASH Programs									R0										R0	
									R0										R0	
									R0										R0	
									R0										R0	
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Nr	Project Reference Number (Dept)	Project Name	Description	Project Driver	Main Category "W" or "S"	Sub Category	Component type	Project Budget / Funding Sources										MTEF Project Source
								Prev spent FY2023/24	Budget	FY2025/26								
									Own	MIG	RBIG	WSIG	WCED	MWIG	Other			
1. Infrastructure Projects								R0	R0								R0	
								R0	R0							R0		
2. Source Development Projects								R0	R0								R0	
								R0								R0		
3. Demand Management projects								R0	R0								R0	
								R0								R0		
4. O&M Commitments								R0	R0								R0	
Operations									R0								R0	
Maintenance									R0								R0	
5. Institutional								R0	R0								R0	
								R0								R0		
6. Water Services Programmes								R0	R0								R0	
Awareness and WASH Programs									R0								R0	
		Total						R0	R0							R0		

2022-2027 WATER SERVICES DEVELOPMENT PLAN: EXECUTIVE SUMMARY



Table E.2c: Water Services MTEF Projects - FY2026/27 (3rd year MTEF period)																			
Nr	Project Reference Number (Dept)	Project Name	Description	Project Driver	Main Category "W" or "S"	Sub Category	Component type	Project Budget / Funding Sources										MTEF Project Source	
								Prev spent FY2023/24	Budget	FY2026/27									Total Cost
										Own	MIG	RBIG	WSIG	WCED	MWIS	Other			
1. Infrastructure Projects								R0	R0									R0	
								R0										R0	
								R0										R0	
2. Source Development Projects								R0	R0									R0	
								R0										R0	
3. Demand Management projects								R0	R2 706									R2 706	
	BW2425003	Upgrading of existing irrigation PS at Beaufort West WWTW	Upgrading and refurbishment of final effluent PS	Reduce potable water demand for irrigation	Sanitation	Re-use	Final Effluent PS		R2 706		R2 706							R2 706	
								R0										R0	
4. O&M Commitments								R0	R0									R0	
Operations								R0										R0	
Maintenance								R0										R0	
								R0										R0	
5. Institutional								R0	R0									R0	
								R0										R0	
6. Water Services Programmes								R0	R0									R0	
Awareness and WASH Programs								R0	R0									R0	
								R0										R0	
		Total						R0	R2 706									R2 706	



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, taking into account improved water demand estimates and subsequent infrastructure developments which may have taken place. The recommended projects from the Beaufort West Master Plans were incorporated into the WSDP.

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 by Beaufort West Municipality will be based on the following plans and processes:

- Water and Sewer Master Plans and Water and Waste Water Treatment Works Master Plans/studies;
- Infrastructure replacement needs (Asset Register);
- Ad-hoc technical investigations;
- Budget proposals; and
- Asset Management Plans.

The only water and sewerage capital infrastructure projects included in Beaufort West Municipality's approved 2024/2025 MTEF Capital Budget are the following (Next three years).

- Repairs to vandalized switchgear for critical boreholes for R1 217 392 (2024/2025)
- New telemetric system R956 522 (2024/2025).
- Upgrading of existing irrigation pump station at Beaufort West WWTW R2 705 546 (2026/2027).

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

- Water must be placed at the center 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 project needs are estimated at R60.130 million for the next three years of which 8% 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.



Table F.1: WSDP FY2024/25: 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 in the informal areas in Murraysburg without communal water services.	Ensure all households in informal areas are provided with at least basic water services (Communal Taps)	WSDP	No	BW2425004	Provide communal taps for all households in informal areas in Murraysburg (Additional 5 Taps).	R50	Yes	No	No
2.2	Some households in the informal areas without communal toilets.	Ensure all households in informal areas are provided with at least basic sanitation services (Communal Toilets)	WSDP	No	BW2425005	Provide communal toilets for all households in informal areas (Additional 13 toilets).	R130	Yes	No	No
2.3	Some households on the farms without basic water services.	Ensure all households on the farms are provided with at least basic water services	WSDP	No	BW2425006	Provide basic water services to the households on the farms without basic water services	R1 260	Yes	No	No
2.4	Some households on the farms without basic sanitation services.	Ensure all households on the farms are provided with at least basic sanitation services	WSDP	No	BW2425007	Provide basic sanitation services to the households on the farms without basic sanitation services	R5 200	Yes	No	No
2.5	Service levels of schools in rural areas not known	Confirm service levels of schools in rural areas.	WSDP	No	BW2425008	Survey to confirm the service levels of the schools on the farms in the rural areas.	R25	Yes	No	No
2.6	Water and Sanitation Service Level Policy is not in place.	Ensure a Water and Sanitation Service Level Policy is in place.	WSDP	No	BW2425009	Draft a Water and Sanitation Service Level Policy.	R150	Yes	No	No
Topic 3: Water Services Asset Management (Infrastructure)										
3.1	Current final effluent PS at Beaufort West WWTW was vandalised.	Reduce potable water demand for irrigation	MTREF Project	Yes	BW2425003	Upgrading of existing Irrigation PS at Beaufort West WWTW	R17 000	Yes	Yes	Yes
Topic 4: Water Services Operation and Maintenance										
4.1	Current Telemetric system needs to be upgraded.	Ensure adequate monitoring and management of water	MTREF Project	Yes	BW2425002	New Telemetric System	R957	Partly	Yes	Yes
4.2	The Water Safety Plan is outdated	Ensure risks wrt the WTWs and water reticulation networks are adequately monitored and managed.	WSDP	No	BW2425010	Update the Water Safety Plan	R250	Yes	No	No
4.3	The W2RAP is outdated	Ensure risks wrt the WWTWs and sewer drainage networks are adequately monitored and managed.	WSDP	No	BW2425011	Update the W2RAP	R250	Yes	No	No
4.4	Asset Management Plan is not in place.	Ensure sufficient budget allocation toward refurbishment of existing water and sewerage infrastructure.	WSDP	No	BW2425012	Compile an Asset Management Plan	R750	Yes	No	No
4.5	Monitoring data only analysed by a geohydrologist on an ad-hoc basis	Implement Groundwater Monitoring Programme	WSDP	No	BW2425013	Implementation of Groundwater Monitoring Programme	R500	Yes	No	No
4.6	Current operational water quality monitoring programme is not adequate	Implement Operational Water Quality Monitoring Programme that complies with SANS241:2015 requirements	WSDP and WTW Process Audits	No	BW2425014	Implement adequate operational water quality monitoring programmes.	R500	Yes	No	No
4.7	Current operational and compliance wastewater monitoring programmes are not adequate.	Implement Operational and Compliance Wastewater Quality Monitoring Programmes for Process Control and to ensure compliance with Authorisation requirements.	WSDP and WWTW Process Audits	No	BW2425015	Implement adequate operational and compliance wastewater quality monitoring programmes.	R500	Yes	No	No
Topic 5: Conservation and Demand Management (Topic 5.1 Water Resources)										
5.1	Extremely high NRW and Water Losses (NRW 77.1% Water Losses 76.9%)	Implement proposed WC/WDM measures	WC/WDM Strategy & WSDP	No	BW2425016	Implement proposed WC/WDM Measures in Beaufort West	R15 498	Partly	No	No
5.2	Extremely high NRW and Water Losses (NRW 46.5% Water Losses 46.3%)	Implement proposed WC/WDM measures	WC/WDM Strategy & WSDP	No	BW2425017	Implement proposed WC/WDM Measures in Merweville	R781	Partly	No	No
5.3	Extremely high NRW and Water Losses (NRW 63.1% Water Losses 62.9%)	Implement proposed WC/WDM measures	WC/WDM Strategy & WSDP	No	BW2425018	Implement proposed WC/WDM Measures in Nelspoort	R799	Partly	No	No
5.4	Extremely high NRW and Water Losses (NRW 93.4% Water Losses 93.2%)	Implement proposed WC/WDM measures	WC/WDM Strategy & WSDP	No	BW2425019	Implement proposed WC/WDM Measures in Murraysburg	R1 463	Partly	No	No
Topic 5: Conservation and Demand Management (Topic 5.2 Water Balance)										
	Included under Topic 5.1 above									
Topic 6: Water Resources										
	Large number of boreholes in Beaufort West non-operational and vandalised.	Ensure adequate yield from available water resources.	MTREF Project WSDP	Yes Partly	BW2425001 BW2425001	Repairs to vandalized switchgear for critical boreholes Refurbishment of non-operational and vandalised boreholes in Beaufort West	R1 217 R12 850	Partly Yes	Yes Partly	Yes Partly
Topic 7: Financial										
	Done by other Department									
Topic 8: Institutional Arrangements and Customer Care										
	Done internally through O&M Budget									
TOTAL: CURRENT NEEDS							R60 130			
	Funded in next three years						R4 879			
	% funded						8%			



Table F.1: WSDP FY2024/25: 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 and Resources										
F.1	Inadequate capacity of existing bulk water pipeline and water reticulation network infrastructure.	Ensure adequate bulk water pipeline and water reticulation network capacity.	Water Master Plan	No	BW2425020	Beaufort West: Upgrade of bulk water pipelines and water reticulation networks	R9 676	Yes	No	No
F.2			Water Master Plan	No	BW2425021	Merweville: Upgrade of bulk water pipelines and water reticulation networks	R721	Yes	No	No
F.3			Water Master Plan	No	BW2425022	Murraysburg: Upgrade of bulk water pipelines and water reticulation networks	R2 510	Yes	No	No
F.4	Inadequate capacity of existing reservoir storage capacity.	Ensure adequate bulk water storage capacity.	Water Master Plan	No	BW2425023	Beaufort West: Construct new reservoirs	R31 060	Yes	No	No
F.5			Water Master Plan	No	BW2425024	Merweville: Construct new reservoir	R3 285	Yes	No	No
F.6			Water Master Plan	No	BW2425025	Nelspoort: Construct new reservoir	R3 285	Yes	No	No
F.7			Water Master Plan	No	BW2425026	Murraysburg: Construct new reservoirs	R7 004	Yes	No	No
F.8	Inadequate capacity of existing water pump stations	Ensure adequate water pump station capacity.	Water Master Plan	No	BW2425027	Beaufort West: Upgrade of the Uitspan Booster PS	R4 000	Yes	No	No
F.9	Inadequate capacity of existing WTWs	Ensure adequate water treatment capacity	WTW Process Audits	No	BW2425028	Refurbishment of the Beaufort West WTW	R8 000	Yes	No	No
F.10			WTW Process Audits	No	BW2425029	Upgrading of the Nelspoort WTW	R18 000	Yes	No	No
F.11	Inadequate capacity of existing bulk sewer pipeline and sewer drainage network infrastructure.	Ensure adequate bulk sewer pipeline and sewer drainage network capacity.	Sewer Master Plan	No	BW2425030	Beaufort West: Upgrade of bulk sewer pipelines and sewer drainage networks.	R11 851	Yes	No	No
F.12			Sewer Master Plan	No	BW2425031	Merweville: Install additional sewer drainage networks	R6 883	Yes	No	No
F.13			Sewer Master Plan	No	BW2425032	Nelspoort: Upgrade of bulk sewer pipelines and sewer drainage networks.	R1 386	Yes	No	No
F.14			Sewer Master Plan	No	BW2425033	Murraysburg: Upgrade of bulk sewer pipelines and sewer drainage networks.	R15 000	Yes	No	No
F.15	Inadequate capacity of existing sewer pump stations.	Ensure adequate sewer pump station capacity.	Sewer Master Plan	No	BW2425034	Upgrade Nelspoort main sewer PS and provide additional pump for Garage PS	R1 800	Yes	No	No
F.16			Sewer Master Plan	No	BW2425035	Refurbishment of Murraysburg sewer PS	R1 750	Yes	No	No
F.17	Inadequate capacity of existing WWTWs.	Ensure adequate wastewater treatment capacity.	WWTW Process Audits	No	BW2425036	Upgrade Beaufort West WWTW	R49 800	Yes	No	No
F.18			WWTW Process Audits	No	BW2425037	Refurbishment of Merweville WWTW and new fence	R5 000	Yes	No	No
F.19			WWTW Process Audits	No	BW2425038	Install new fence at Nelspoort WWTW	R500	Yes	No	No
F.20			WWTW Process Audits	No	BW2425039	Upgrade Murraysburg WWTW	R10 000	Yes	No	No
F.21	Yields from current surface and groundwater resources are inadequate to meet future water requirements.	Ensure adequate raw water supply (Sufficient yield from available surface and groundwater resources)	WSDP	No	BW2425040	Additional groundwater augmentation for Beaufort West (Karoo National Park)	R60 000	Yes	No	No
TOTAL: FUTURE NEEDS							R251 511			