OVERSTRAND MUNICIPALITY

Water Services Development Plan (WSDP) – IDP Water Sector Input Report

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

FY 2022/2023

FINAL

31 May 2022

OVERSTRAND MUNICIPALITY

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OVERSTRAND MUNICIPALITY

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PROJECT P07675 - OVERSTRAND MUNICIPALITY'S WSDP-IDP SECTOR INPUT REPORT FOR 2022/2023

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WSDP – IDP WATER SECTOR INPUT REPORT (EXECUTIVE SUMMARY)

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Section B: State of Water Services Planning

Section C: Water Services Existing Needs Perspective

Section D: Water Services Strategies

Section E: Water Services MTEF Projects

Section F: WSDP Projects

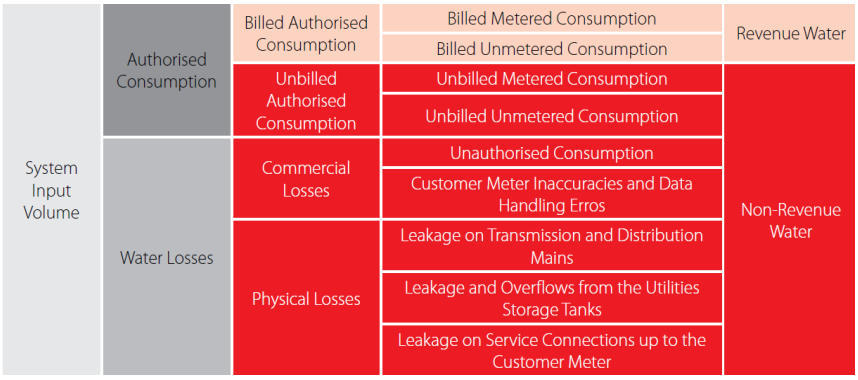
Figures

AADD	Average Annual Daily Demand
AC	Asbestos Cement
ACH	Aluminium Chlorohydrate
ADWF	Average Dry Weather Flow
AIDS	Acquired Immune Deficiency Syndrome
AMP	Asset Management Plan
AMR	Automatic Meter Reading
BDS	Blue Drop System
BGCMA	Breede-Gouritz Catchment Management Agency
BGWMA	Breede-Gouritz Water Management Area
BOCMA	Breede-Overberg Catchment Management Agency
CAPEX	Capital Expenditure
CBO	Community Based Organisation
COD	Chemical Oxygen Demand
COVID	Covid-19 Pandemic
CRC	Current Replacement Cost
CRR	Cumulative Risk Ratio
CU	Consumer Unit
CWDP	Coastal Water Discharge Permit
CV	Carrying Value
DAFF	Dissolved Air Flotation and Filtration
DBSA	Development Bank of South Africa
DEA&DP	Department of Environmental Affairs and Development Planning
DM	Disaster Management
DMC	Disaster Management Centre
DO	Dissolved Oxygen
DRC	Depreciated Replacement Cost
DWQ	Drinking Water Quality
DWS	Department of Water and Sanitation
EHP	Environmental Health Practitioner
EIA	Environmental Impact Assessment
FOG	Fats, Oils and Grease
FY	Financial Year
GAMAP	General Accepted Municipal Accounting Practice
GDIP	Green Drop Improvement Plan
GIS	Geographical Information Systems
GRAP	Generally Recognized Accounting Practice
HH	Households
HIV	Human Immunodeficiency Virus
HOD	Head of Department
IBT	Inclining Block Tariff
IDP	Integrated Development Plan
ILI	Infrastructure Leakage Index
IMQS	Infrastructure Management Query System
IRIS	Integrated Regulatory Information System
IWA	International Water Association
l/c/d	Litre Per Capita Per Day
JOC	Joint Operation Centre

KPA	Key Performance Area
KPI	Key Performance Indicator
L	License
LGTAS	Local Government Turn Around Strategy
LL	Low Level
LM	Local Municipality
l/p/d	Litre Per Person Per Day
m	Metre
MCC	Motor Control Centre
MFMA	Municipal Finance Management Act
MIG	Municipal Infrastructure Grant
MISA	Municipal Infrastructure Support Agent
Ml	Mega Litre
Ml/a	Mega Litre per Annum
Ml/d	Mega Litre per Day
MLSS	Mixed Liquor Suspended Solids
MNF	Minimum Night Flow
MTEF	Medium-Term Expenditure Framework
MuSSA	Municipal Strategic Self-Assessment
N/A	Not Applicable
NGO	Non-Governmental Organisation
NRW	Non-Revenue Water
NWRS	National Water Resource Strategy
O&M	Operation and Maintenance
PAT	Progress Assessment Tool
PDA	Previously Disadvantage Area
PDD	Peak Daily Demand
P&G	Preliminary and General
PRP	Pipeline Replacement Programme
PRV	Pressure Reducing Valve
PS	Pump Station
RAS	Return Activated Sludge
RDP	Reconstruction and Development Programme
RO	Reverse Osmosis
RR	Risk Ratio
RUL	Remaining Useful Life
SALGA	South African Local Government
SAMRAS	South African Municipal Resource Administration System
SANDF	South African National Defense Force
SANS	South African National Standard
SAPS	South African Police Service
SCADA	Supervisory Control and Data Acquisition
SDBIP	Service Delivery and Budget Implementation Plan
SDF	Spatial Development Framework
SST	Secondary Settling Tank
SWRO	Sea Water Reverse Osmosis
TMG	Table Mountain Group
TSS	Total Suspended Solids

VIP	Ventilated Improved Pit
WARMS	Water use Authorisation and Registration Management System
WAS	Waste Activated Sludge
WC/WDM	Water Conservation / Water Demand Management
WCNCB	Western Cape Nature Conservation Board (South Africa)
WDM	Water Demand Management
WMA	Water Management Area
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSIG	Water Services infrastructure Grant
WSP	Water Services Provider
WTP	Water Treatment Plant
WTW	Water Treatment Works
WULA	Water Use License Application
WW	Waste Water
W_2RAP	Waste Water Risk Abatement Plan
WWTW	Waste Water Treatment Works
Y	Yield

KEY TERMS AND INTERPRETATIONS

Climate Change	Changes in climatic conditions due to natural causes or to anthropogenic (man-made) effects such as emissions of greenhouse gases, e.g. carbon dioxide, nitrous oxide, and methane, from industry, transport, farming and deforestation, that are expected to have significant consequences for rainfall and water availability on earth.
Current replacement cost (CRC)	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset. GAMAP defines CRC as the cost the entity would incur to acquire the asset on the reporting date.
Depreciated Replacement Cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
Financial Year	Financial year means in relation to- • a national or provincial department, the year ending 31 March; or • a municipality, the year ending 30 June.
Global Warming	The increase in the average surface temperatures across the globe, usually measured over long periods of time; reported to have increased by 1ºC over the past hundred years.
Integrated Development Plan (IDP)	An IDP is a legislative requirement for municipalities, which identifies the municipality's key development priorities; formulates a clear vision, mission and values; formulates appropriate strategies; shows the appropriate organisational structure and systems to realise the vision and the mission and aligns resources with the development priorities.
National Water Resource Strategy 2	Sets out how we will achieve the following core objectives: • Water supports development and the elimination of poverty and inequality. • Water contributes to the economy and job creation, and • Water is protected, used, developed, conserved, managed and controlled sustainably and equitably.
International Water Association (IWA) Water Balance	
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.

WSDP – IDP Water Sector Input Report (Executive Summary)

Introduction

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

Sections 12 and 13 of the Water Services Act (Act No 108 of 1997) place a duty on WSAs to prepare and maintain a WSDP, as part of the process of preparing an IDP. The DWS has developed a new set of WSDP guidelines to assist WSAs with the WSDP process and to provide a framework for the capturing of the data. The topics included in the guidelines and addressed in detail in Overstrand Municipality's WSDP are as follows:

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

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

- All WSAs must develop a WSDP.
- A new plan must be developed every five years and the plan should be updated as necessary and appropriate in the interim years.
- The WSDP must be integrated with the IDP of the municipality, as required in terms of the Municipal Systems Act.
- The WSDP must integrate water supply planning with sanitation planning.
- The WSDP must integrate technical planning with social, institutional, financial and environmental planning. The planning of capital expenditures must also be integrated with the associated operation and maintenance requirements and expenditures.
- The WSDP must be informed by the business plans developed by water services providers and with the plans of any regional water services providers, as relevant.
- The plan must take into account the impact of HIV/Aids on future water demand.
- The WSDP must integrate with the catchment management strategy.
- The planning process must take into account the views of all important stakeholders, including communities, through a consultative and participatory process. Every effort must be made to ensure the adequate and meaningful participation of women in consultation forums.
- The draft plan must be made available for public and stakeholder comment and all comments made must be considered when preparing the final plan.
- The contents of the WSDP must be communicated to all important stakeholders, including the DWS.

- A WSA must report annually and in a public way on progress in implementing the plan (Annual WSDP Performance- and Water Services Audit Report).

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

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

The **SWOT analysis** for Overstrand Municipality indicated the following Threats, Strengths, Weaknesses and Opportunities (2021/2022 IDP).

Threats:

- Covid-19 pandemic;
- Adverse economic climate affecting the revenue stream of the Municipality;
- Urbanisation; and
- Excessive red tape.

Strengths:

- Ethical, participative and accountable governance;
- Stable, skilled and highly knowledgeable workforce; and
- Available and well maintained municipal infrastructure that enhances social and economic growth.

Weaknesses:

- Lack of suitable land for urban expansion in certain areas due to topography (land locked between sea and mountain);
- Lack of affordable residential accommodation;
- Inadequate and/or non-existing public transport services that hamper opportunities to develop local economy;
- Gaps in pro-active and timely communication through the relevant mechanisms; and
- Inadequate resources to combat disasters.

Opportunities:

- Diverse economic income streams;
- Capitalise on its ability to foster local economic development;
- Promote safety and security;
- Make the most of its unique natural assets;
- Capacity building of elected statutory structures and community structures to be able to deal with challenges in local communities;
- Promotion of diversity and social cohesion.

SECTION A: STATUS QUO OVERVIEW

Overstrand Municipality is situated within the Breede-Gouritz Water Management Area (WMA). The Municipality consists of fourteen (14) individual wards and is the only WSA within this municipal area and is also the Water Services Provider for the internal water and sewerage networks and services. The bulk water and sewerage infrastructure is operated and maintained by an external Service Provider. Overstrand Municipality's Management Area includes the following towns and ***Water Distribution Systems***:

- Rooi Els, Pringle Bay, Betty's Bay – ***Buffels River System***

  The towns of Rooi Els, Pringle Bay and Betty's Bay obtain their bulk water from the Buffels River Dam. The raw water is treated at the Buffels River WTW before it is distributed to the various consumers in Rooi Els, Pringle Bay and Betty's Bay.

- Kleinmond – ***Kleinmond System***

  Kleinmond is supplied from the Palmiet River and the "Dorpsfontein". A borehole (1998), located 300m to the east of the fountain, is available as additional source in case of emergency. The raw water is treated at the Kleinmond WTW before it is distributed to the various consumers in Kleinmond.

- Fisherhaven, Hawston, Vermont, Onrus, Sandbaai, Hermanus – ***Greater Hermanus System***

  The Greater Hermanus area is supplied with bulk surface water from De Bos Dam and bulk groundwater from the Gateway-, Camphill- and Volmoed Well Fields. The surface and groundwater are treated at the Preekstoel WTW before it is distributed to the various consumers in the Greater Hermanus area. A portion of the final effluent from the Hermanus WWTW is used for irrigation purposes. Raw surface water from the Mossel River and Fisherhaven Dams is also used for irrigation purposes.

- Stanford – ***Stanford System***

  Stanford is supplied with bulk water from the high discharging Stanford Spring, generally known as "Die Oog" (the Eye), which was previously the sole source of supply of potable water to the town and the greater area. Two boreholes (KVE01 and KVE02) were drilled and put into operation and new bulk supply pipelines were constructed during the 2011/2012 financial year in order to connect boreholes to the existing network. The raw water quality is "Excellent", but the total hardness exceeds desired levels, and therefore a reverse osmosis treatment plant was commissioned to address this aspect before water is distributed to the various consumers in Stanford.

- De Kelders, Gansbaai, Kleinbaai, Franskraal – ***Greater Gansbaai System***

  The water sources of Gansbaai, De Kelders, Kleinbaai and Franskraal are integrated with each other through the bulk water supply distribution system. In the past specific sources were utilised for specific areas, but due to peak supply limitations of underground resources during peak seasons, the system has become completely integrated. Bulk water supply to the Greater Gansbaai system is from the Franskraal and Kraaibosch dams and the Klipgat and Grotte water sources, which consist of a spring in the De Kelders caves and a spring at Stanfords Bay. The raw water from the Franskraal and Kraaibosch dams are treated at the Franskraal WTW and the water from the Klipgat and Grotte water sources are treated at the De Kelders WTW. Final effluent from the Gansbaai WWTW is used for irrigation purposes at a sports complex.

- Pearly Beach – ***Pearly Beach System***

  Pearly Beach is supplied from seven springs located in the mountains some 6 km from Pearly Beach. The water from the springs is kept in storage at the Pearly Beach Dam. A Service Level Agreement is also in place for the supply of 0.26 Ml/d from the Koekemoer Dam free of charge to the Municipality. The raw water is treated at the Pearly Beach WTW before it is distributed to the various consumers in Pearly Beach.

- Baardskeerdersbos – ***Baardskeerdersbos System***

  Bulk water supply to Baardskeerdersbos is from two boreholes. Baardskeerdersbos previously received their bulk water from the Boskloof Stream, but all current bulk water supply to the area and in the future will be from the boreholes. The groundwater is treated at the Baardskeerdersbos WTW before it is distributed to the various consumers in Baardskeerdersbos.

- Buffeljags Bay – ***Buffeljags Bay System***

  Bulk water supply to Buffeljags Bay is from a borehole. The water is disinfected before it is distributed to the various consumers in Buffeljags Bay.

The most significant challenges experienced by Overstrand Municipality from a water and sanitation services delivery perspective, as summarised in the draft 2020/2021 Annual Report, are as follows.

- Vandalism and theft of water infrastructure and equipment;
- Aging water infrastructure;
- Additional water source required for Hermanus in the medium term;
- Need for the upgrade of WWTWs in some areas;
- Extension of waterborne sewer networks;
- Sludge handling according to legislation;
- Extension of basic sanitation services;
- Lack of knowledge of sewer systems by consumers;
- Ageing sewerage infrastructure / lack of maintenance funds;
- Storm water infiltration into sewer networks;
- Sewer blockages; and
- Conservancy tank service (tanker trucks).

Physical Perspective:

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

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

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

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

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

Natural Environment:

Overstrand Municipality strives towards sustainable environmental management by means of environmental good practice. Accordingly, the Environmental Management section strives to coordinate, plan and manage all human activities in a defined environmental system, to accommodate the broadest possible range of sustainable short and long term environmental, social and economic development objectives. The mission of the section is to promote the use of sound environmental management principles to ensure a healthy environment within the Overstrand Municipality.

TOPIC 1: SETTLEMENTS AND DEMOGRAPHICS

The tables below gives an overview of the settlements, population and households in Overstrand Municipality's Management Area for 2020/2021. 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 (Permanent)	115 136	80%
1.2 Total Number of Households (Permanent)	39 963	80%
1.3 Average Household Size	2.88	80%
1.4 Total Number of Settlements (GeoDatabase)	60	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 (GeoDatabase)	Population	Households	Assessment Score
Rural	10	5 434	2 062	80%
Urban	50	109 702	37 901	80%
Total	**60**	**115 136**	**39 963**	**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 GeoDatabase**	**Population**	**Households**	**Avg. Household Size**	**Assessment Score**
Rural	Farming	9	5 434	2 062	2.64	80%
Rural	Rural – Informal Settlements	1	60	15	4.00	80%
Urban	Urban - Informal Settlements	23	39 152	9 788	4.00	80%
Urban	Urban - Formal Town	27	70 490	28 098	2.51	80%
Total		**60**	**115 136**	**39 963**	**2.88**	**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	13	80%
Educational facilities	39	80%

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

The Community Survey of 2016 from Statistics South Africa estimate the 2016 population for Overstrand Municipality at 93 466 persons and the permanent households at 35 739, at an average household size of 2.6 persons per household.

Overstrand Municipality's Spatial Development Framework (SDF), May 2020, estimated the 2019 population at 116 550 persons. The SDF indicated that the population of the Overstrand Municipality grew at an approximate rate of 3% per annum between 2011 and 2016, and that future growth will continue to be between 2.8% and 3.3% per annum.

The 2020 Socio Economic Profile of Overstrand Municipality (Western Cape Government) indicates the 2020 population of Overstrand Municipality at 104 748 persons. The Municipality's Final IDP of 26 May 2021 (4th and final review of 5 Year IDP, 2021/2022) indicates the 2020 projected population at 108 460 persons. This projected population is estimated to increase to 118 316 by 2024, which equates to a 3.1% average annual growth rate. The IDP estimated the permanent households for the 2019/2020 financial year at 35 385.

The on-going in-migration into the Overstrand Municipal area will place increasing demands on the infrastructure and available space for urban growth. The increased footprint in the Municipal area needs careful management if it is not to impact negatively on the natural environment of Overstrand. The increased population growth will place increased pressure on the municipal resources to develop new as well as maintain existing infrastructure. The 2020/2021 populations for the various water distribution systems were estimated by applying the annual growth rates as indicated in the table below. The current population figures and the annual population growth percentages used in the WSDP Performance- and Water Services Audit Report 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 Community Services and Engineering Planning Departments during January 2014.

Table A.1.5: Estimated Future Annual Population Growth Percentages, Population and Households per Distribution System			
Town	**Estimated future annual Population Growth %**	**Projected 2020/2021 Persons**	**Projected 2020/2021 Households**
Buffels River	4.15%	3 312	1 670
Kleinmond	2.50%	8 279	3 413
Greater Hermanus	4.45%	70 038	23 110
Stanford	2.65%	6 050	1 889
Greater Gansbaai	4.89%	20 479	7 158
Pearly Beach	2.11%	1 263	585
Baardskeerdersbos	0.50%	128	41
Buffeljags Bay	0.50%	154	35
Farms	1.56%	5 434	2 062
Total	**4.07%**	**115 136**	**39 963**

The current 2020/2021 population for Overstrand Municipality is therefore estimated at 115 136 persons and the permanent households at 39 963, as indicated in the table above. This projected population compares well with the population included in the Municipality's SDF.

The tables below give an overview of the projected population and permanent number of households and the water and sanitation service levels in Overstrand Municipality's Management Area.

Table A.1.6: Water Services Overview (Water)

Settlement Type	2011/2012 Households	2011/2012 Population	2020/2021 Households	2020/2021 Population	Water category: Adequate: Formal	Adequate: Informal	Adequate: Shared Services	Water resources needs only	O&M needs only	Infrastructure needs only	Infrastructure & O&M needs	Infrastructure, O&M & Resource need	No Services: Informal	No Services: Formal
URBAN														
Metropolitan Area					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Formal Town					Adequate			Below RDP					None	
Buffels River	1,158	2,297	1,670	3,312	P		P							
Kleinmond	2,351	5,101	2,531	4,751	P		P							
Greater Hermanus	14,256	41,884	16,452	43,406	P		P							
Stanford	1,379	4,325	1,555	4,714	P		P							
Greater Gansbaai	3,251	7,698	5,017	11,915	P		P							
Pearly Beach	314	363	459	759	P		P							
Baardskeerdersbos	39	122	41	128	P									
Buffeljagsbaai	33	147	35	154	P									
Sub-Total	**22,781**	**61,937**	**27,760**	**69,138**										
Townships					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Informal Settlements					Adequate			Below RDP					None	
Greater Gansbaai	1,407	5,628	2,126	8,504		P								
Greater Hermanus	1,362	5,448	6,658	26,632		P								
Kleinmond	382	1,528	882	3,528		P								
Stanford	114	456	334	1,336		P								
Pearly Beach	171	684	126	504		P								
Buffeljagsbaai	171	684	15	60		P								
Sub-Total	**3,607**	**14,428**	**10,141**	**40,564**										
Working towns & service centres					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Sub-Total: (Urban)	**26,388**	**76,365**	**37,901**	**109,702**										
RURAL														
Rural / Farming					Adequate			Below RDP					None	
Overstrand Rural	1,794	4,727	2,062	5,434	P		P							P
Sub-Total	**1,794**	**4,727**	**2,062**	**5,434**										
Informal Settlements					Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**										
Sub-Total (Rural)	**1,794**	**4,727**	**2,062**	**5,434**										
TOTAL	**28,182**	**81,092**	**39,963**	**115,136**										

Note: P - Partially (More than one type of service)

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 tariffed.
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 tariffed.
	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 tariffed.
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 tariffed.
	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 tariffed.
	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 Overstrand Municipality's Management Area are provided with water and sewer connections inside the premises. Informal areas are supplied with shared services as an intermediary measure. Overstrand 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. Overstrand 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.

Overstrand Municipality's challenges with regard to the provision of basic water and sanitation services are as follows.

- The operation and maintenance of communal services in informal areas are a challenge, with regular sewer blockages, vandalism of infrastructure and facilities and water leaks.
- 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 Overstrand Municipality.

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

Census Category	Description	Year 0		Year -1		Year 2	
		FY2020/21		FY2019/20		FY2018/19	
		Nr	%	Nr	%	Nr	%
	WATER (ABOVE MIN LEVEL)						
Piped (tap) water inside dwelling/institution	House connections	38,808	71%	37,903	81%	37,349	81%
Piped (tap) water inside yard	Yard connections	5,300	10%	5,300	11%	5,300	11%
Piped (tap) water on community stand: distance less than 200m from dwelling/institution	Standpipe connection < 200 m	10,172	19%	3,706	8%	3,651	8%
	Sub-Total: Minimum Serivce Level and Above	**54,280**	**100%**	**46,909**	**100%**	**46,300**	**100%**
	WATER (BELOW MIN LEVEL)						
Piped (tap) water on community stand: distance between 200m and 500m from dwelling/institution	Standpipe connection: > 200 m < 500 m	21	0%	21	0%	21	0%
Piped (tap) water on community stand: distance between 500m and 1000m (1km) from dwelling /institution	Standpipe connection: > 500 m < 1 000 m	8	0%	8	0%	8	0%
Piped (tap) water on community stand: distance greater than 1000m (1km) from dwelling/institution	Standpipe connection: > 1 000 m	5	0%	5	0%	5	0%
No access to piped (tap) water	No services	49	0%	49	0%	49	0%
	Sub-Total: Below Minimum Service Level	**83**	**0%**	**83**	**0%**	**83**	**0%**
	Total number of households	**54,363**	**100%**	**46,992**	**100%**	**46,383**	**100%**

Note: The households in the above residential water services delivery access profile include all permanent residential households, holiday homes, the households in informal areas and the backyard dwellers and is not the same as only the permanent residential households in Table A.1.6.

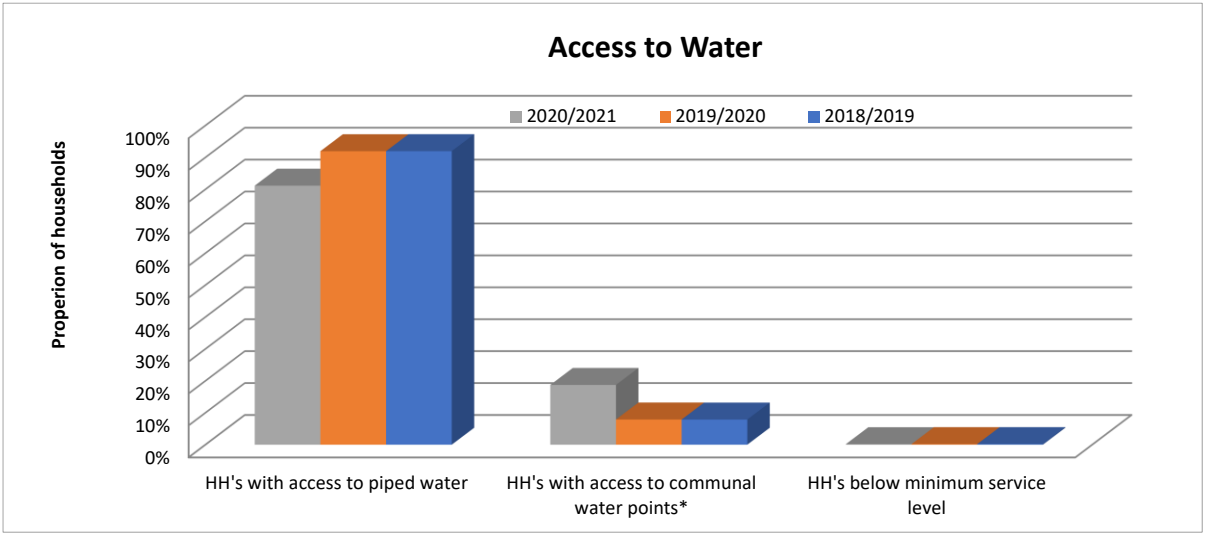


Figure A.2.1: Access to Water Services.

The existing residential water service levels in Overstrand Municipality's Management Area are indicated in the table below.

Table A.2.4: Residential Water Service Levels (Residential Consumer Units)

Service Level	Buffels River	Kleinmond	Greater Hermanus	Stanford	Greater Gansbaai	Pearly Beach	Baardskeer-dersbos	Buffeljags Bay	Farms	Total
No Water Services	0	0	0	0	0	0	0	0	49 [2)]	49
Below RDP: Infrastructure Upgrade	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure Extension	0	0	0	0	0	0	0	0	34 [3)]	34
Below RDP: Infrastructure Refurbishment	0	0	0	0	0	0	0	0	0	0
Below RDP: O&M Needs	0	0	0	0	0	0	0	0	0	0
Below RDP: Water Resource Needs	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
Below RDP: Infrastructure, O&M and Water Resource Needs	0	0	0	0	0	0	0	0	0	0
Total Basic Need (RDP)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**83**	**83**
Below Housing Interim [4)]	0	0	0	0	0	0	0	0	0	0
Adequate Housing Permanent [5)]	0	882	6 658	334	2 126	126	0	15	0	10 141
Total Housing Need	**0**	**882**	**6 658**	**334**	**2 126**	**126**	**0**	**15**	**0**	**10 141**
Standpipes	0	0	0	0	0	0	0	0	31	31
Yard Connections [6)]	6	282	3 623	482	625	39	0	0	243	5 300
House Connections [1)]	3 623	3 649	20 536	1 295	6 194	1 710	66	30	1 705	38 808
Total Adequate	**3 629**	**3 931**	**24 159**	**1 777**	**6 819**	**1 749**	**66**	**30**	**1 979**	**44 139**
Total Residential Consumer Units for the Municipality	**3 629**	**4 813**	**30 817**	**2 111**	**8 945**	**1 875**	**66**	**45**	**2 062**	**54 363**

Notes:

1) Number of residential consumer units for urban areas for 2020/2021, as taken from the financial system.

2) Census 2011: Number of households with no access to piped (tap) water 49

3) Census 2011: Number of households with communal services (200m – 500m) 21, (500m – 1000m) 8 and (>1000m) 5.

4) Below Housing Interim in the above table is the number of informal households in informal areas 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, as confirmed by the Municipality (December 2021).

6) Estimated number of backyard dwellers, as agreed with the Municipality during January 2014, as part of DWS's Backlog Eradication Strategy process.

Table A.2.5: Improvement in Eradicating the Water Backlog					
Settlement	Urban / Rural	2020/21		2019/20 (-Y1)	
		Water backlog HH	Water Backlog Population	Water backlog HH	Water Backlog Population
Buffels River	Urban	0	0	0	0
Kleinmond	Urban	0	0	0	0
Greater Hermanus	Urban	0	0	0	0
Stanford	Urban	0	0	0	0
Greater Gansbaai	Urban	0	0	0	0
Pearly Beach	Urban	0	0	0	0
Baardskeerdersbos	Urban	0	0	0	0
Buffeljags Bay	Urban	0	0	0	0
Farms	Rural	83	218	83	218
		83		**83**	

Table A.2.6: Water Supply Level Profile		
Water Profile	Totals	Assessment Score
Total households with a water need (Irrelevant the type of need)	**83**	**80%**
Total households below RDP	**83**	**80%**
Piped water inside the dwelling/house-Households	38 808	80%
Piped water inside yard-Households	5 300	80%
Piped water distance <200m - Households	10 172	80%
Piped water distance >200m - Households	34	60%
Borehole in the yard - Households	0	80%
Rain-water tank in yard - Households	0	80%
Water vendor-carrier/tanker - Households	0	80%
Stagnant water - dam/pool - Households	19	60%
Flowing water/spring/ stream/river - Households	4	60%
Water Other – Households (include no water)	26	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		
Section: Water Reliability Profile	**Totals**	**Assessment Score**
Total Number of Households having Reliable Service	**54 280**	**80%**
Total Number of Households NOT having Reliable Service	**83**	**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 table and graph below give an overview of the sanitation service delivery access profile in Overstrand Municipality's Management Area.

Table A.2.8: Residential Water Services Delivery Access Profile: Sanitation							
Census Category	Description	Year 0		Year -1		Year 2	
		FY2020/21		FY2019/20		FY2018/19	
		Nr	%	Nr	%	Nr	%
	SANITATION (ABOVE MIN LEVEL)						
Flush toilet (connected to sewerage system)	Waterborne	28,376	52%	27,645	59%	27,181	59%
	Waterborne: Low Flush	4,100	8%	4,100	9%	4,100	9%
Flush toilet (with septic tank)	Septic tanks / Conservancy	11,449	21%	11,275	24%	11,185	24%
Chemical toilet	Non-waterborne (min. service level)	5	0%	5	0%	5	0%
Pit toilet with ventilation (VIP)		27	0%	27	0%	27	0%
Other / Communal Services	Waterborne (min. service level, communal)	10,141	19%	3,675	8%	3,620	8%
	Sub-Total: Minimum Serivce Level and Above	**54,098**	**100%**	**46,727**	**99%**	**46,118**	**99%**
	SANITATION (BELOW MIN LEVEL)						
Pit toilet without ventilation	Pit toilet	12	0%	12	0%	12	0%
Bucket toilet	Bucket toilet	68	0%	68	0%	68	0%
Other toilet provision (below min. service level	Other	119	0%	119	0%	119	0%
No toilet provisions	No services	66	0%	66	0%	66	0%
	Sub-Total: Below Minimum Service Level	**265**	**0%**	**265**	**1%**	**265**	**1%**
	Total number of households	**54,363**	**100%**	**46,992**	**100%**	**46,383**	**100%**

Note: The households in the above residential sanitation services delivery access profile include all permanent residential households, holiday homes, the households in informal areas and the backyard dwellers and is not the same as only the permanent residential households in Table A.1.6.

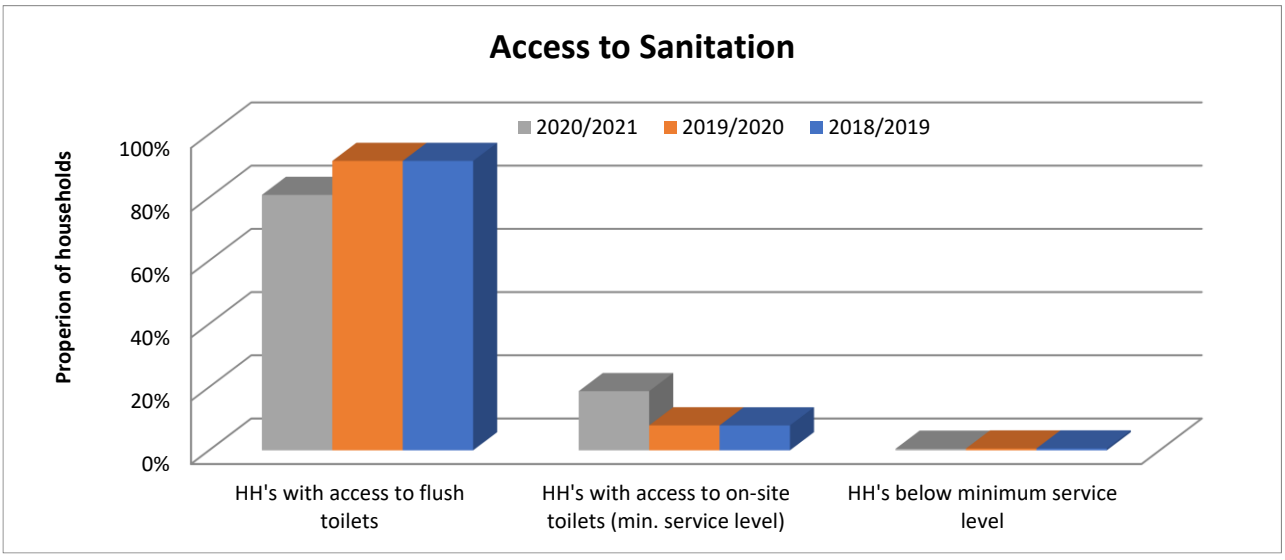


Figure A.2.2: Access to Sanitation Services.

The existing residential sanitation service levels in Overstrand Municipality's Management Area are indicated in the table below.

Table A.2.9: Residential Sanitation Service Levels (Residential Consumer Units)

Service Levels	Buffels River	Kleinmond	Greater Hermanus	Stanford	Greater Gansbaai	Pearly Beach	Baardskeer-dersbos	Buffeljags Bay	Farms	Total
No Sanitation Services	0	0	0	0	0	0	0	0	66 [3)]	66
Below RDP: Infrastructure Upgrade	0	0	0	0	0	0	0	0	204 [4)]	204
Below RDP: Infrastructure Extension	0	0	0	0	0	0	0	0	0	0
Below RDP: Infrastructure Refurbishment	0	0	0	0	0	0	0	0	0	0
Below RDP: O&M Needs	0	0	0	0	0	0	0	0	0	0
Below RDP: Water Resource Needs	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
Below RDP: Infrastructure, O&M and Water Resource Needs	0	0	0	0	0	0	0	0	0	0
Total Basic Need (RDP)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**270**	**270**
Below Housing Interim [5)]	0	0	0	0	0	0	0	0	0	0
Adequate Housing Permanent [6)]	0	882	6 658	334	2 126	126	0	15	0	10 141
Total Housing Need	**0**	**882**	**6 658**	**334**	**2 126**	**126**	**0**	**15**	**0**	**10 141**
No Waterborne (VIP)	0	0	0	0	0	0	0	0	27	27
Waterborne Low Flush	0	0	4 100	0	0	0	0	0	0	4 100
Septic Tanks / Conservancy Tanks	3 629	995	1 358	71	2 904	631	66	30	1 765	11 449
Waterborne	0	2 936	18 701	1 706	3 915	1 118	0	0	0	28 376
Total Adequate [2)]	**3 629**	**3 931**	**24 159**	**1 777**	**6 819**	**1 749**	**66**	**30**	**1 792**	**43 952**
Total Residential Consumer Units for the Municipality	**3 629**	**4 813**	**30 817**	**2 111**	**8 945**	**1 875**	**66**	**45**	**2 062**	**54 363**

1) Total for Septic Tanks and Conservancy tanks in Urban Areas according to Municipal information for June 2020 for "Developed Sites Septic Tanks (SE8D)"

2) Include Backyard dwellers

3) Census 2011: Number of households with no toilet facility 66.

4) Census 2011: Number of households with existing buckets 68, chemical toilets 5, pit toilets without ventilation 12 and "other" 119.

5) Below Housing Interim in the above table is the number of informal households in informal areas without basic sanitation services.

6) Adequate Housing Permanent in the above table is the number of informal households in informal areas with communal ablution facilities, as confirmed by the Municipality (December 2021).

Table A.2.10: Improvement in Eradicating the Sanitation Backlog

Settlement	Urban / Rural	2020/21		2019/20 (-Y1)	
		Sanitation backlog HH	Sanitation Backlog Population	Sanitation backlog HH	Sanitation Backlog Population
Buffels River	Urban	0	0	0	0
Kleinmond	Urban	0	0	0	0
Greater Hermanus	Urban	0	0	0	0
Stanford	Urban	0	0	0	0
Greater Gansbaai	Urban	0	0	0	0
Pearly Beach	Urban	0	0	0	0
Baardskeerdersbos	Urban	0	0	0	0
Buffeljags Bay	Urban	0	0	0	0
Farms	Rural	270	710	270	710
		270		**270**	

Table A.2.11: Sanitation Level of Service		
Section: Sanitation Service Infrastructure Supply Level Profile	**Totals**	**Assessment Score**
Bucket toilet - Households	68	60%
Pit without ventilation - Households	12	60%
Pit toilet with ventilation (VIP) - Households	27	60%
Chemical Toilet - Households	5	60%
Flush toilet (with septic / conservancy tank) - Households	11 464	80%
Flush toilet (connected to sewerage system) - Households	42 602	80%
None - Households	185	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		
Section: Sanitation Reliability Profile	**Totals**	**Assessment Score**
Total number of households having reliable service	**54 093**	**80%**
Total number of households not having reliable service	**270**	**60%**
Infrastructure to be upgraded: None to VIP (HH)	185	60%
Infrastructure requirement: Bucket to VIP (HH)	68	60%
Infrastructure to be upgraded: Pit to VIP (HH)	12	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.2.13: 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)	83	60%
Direct settlement backlog water population. Total population of settlement with a water need (irrelevant the type of need)	218	60%
Direct settlement backlog sanitation households. Total household of settlement with a sanitation need (irrelevant the type of need)	270	60%
Direct settlement backlog sanitation population. Total population of settlement with a sanitation need (irrelevant the type of need)	710	60%

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

Table A.2.14: Interim Water and Sanitation Services (National Norms and Standards for Domestic Water and Sanitation Services)
Intermittent provision of water at a minimum level of water supply services
• A minimum volume of 1 500 litres of potable water shall be made available to a household per week. • The water provided shall comply with the SANS241 quality standards. • The access/delivery point shall be at a minimum a communal standpipe, or a storage facility in the yard (water container, yard tank, roof tank) of at least a volume of 1 500 litres. • In the case of a communal standpipe, it shall be within a reasonable walking distance of no more than 100m from the farthest household. • In the case of a storage facility in the yard (water container, yard tank, roof tank), it shall be refilled by a water tanker with potable water at least once a week. • The water shall be made available for 52 weeks per year. • All water use and/or supply shall be metered, but not tariffed. • Maintenance of the infrastructure for this level of service is the responsibility of the WSA. • Point-of-use water treatment systems and methods shall be advocated. • Efforts shall be made to ensure user acceptance and understanding for this level of service. • Users shall be educated in effective water use and hygiene. • This level of service shall be phased out by 2030 to comply with the National Development Plan's requirement of providing a basic service of at least a yard connection for water.
Interim sanitation services (Communal and shared facilities)
• Users shall be consulted on the siting and design, and the responsible cleaning and maintenance of shared toilets. Clean toilets are more likely to be frequently used.

Table A.2.14: Interim Water and Sanitation Services (National Norms and Standards for Domestic Water and Sanitation Services)
Intermittent provision of water at a minimum level of water supply services

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

Overstrand Municipality's Directorate Community Services regularly count the number of households in the informal areas. The current number of households in the informal areas, with access to communal basic services, is 10 141. The number of households with communal services in the informal areas and the number of households per facility type are summarised in the table below (Dec 2021).

Table A.2.15: Communal Service Levels in the Informal Areas

Area	Informal Settlement	No. of Households	Number of Toilets	Household / Toilet	Number of Taps	Households / Tap
Stanford	Die Kop	180	16	11.3	6	30.0
Kleinmond	Overhills	489	107	4.6	26	18.8
Gansbaai	Masakhane	1 131	269	4.2	39	29.0
	Beverly Hills	0	24	0.0	13	0.0
	Buffeljags Bay	15	10	1.5	4	3.8
Hawston	Erf 170	7	4	1.8	2	3.5
Zwelihle	Tsepe-Tsepe	256	40	6.4	7	36.6
	Serviced Sites	80	25	3.2	5	16.0
	Thambo Square	351	21	16.7	5	70.2
	Asazani	92	14	6.6	5	18.4
	Temporary Relocation Area	250	125	2.0	125	2.0
	New Camp	52	12	4.3	5	10.4
	Transit Camp	171	106	1.6	18	9.5
Sub-Total		**3 074**	**773**	**4.0**	**260**	**11.8**
Communal Service Levels – Emergency Housing						
Stanford	Stanford	154	26	5.9	11	14.0
Hermanus	Mount Pleasant (Cemetry)	25	8	3.1	4	6.3
	Mount Pleasant (Mbeki Str)	29	10	2.9	4	7.3
	Zwelihle	150	42	3.6	13	11.5
Gansbaai	Masakhane	97	14	6.9	4	24.3
	Eluxolweni	126	30	4.2	12	10.5
Sub-Total		**581**	**130**	**4.5**	**48**	**12.1**
Total		**3 655**	**903**	**4.0**	**308**	**11.9**

Notes: No Services, Ratios above Targets, Ratios meeting Targets

The table below indicates the number of communal services provided on erven that was part of the land invasion.

Table A.2.16: Communal Service Levels Provided During Land Invasion

Area	Settlement	No. of Households	Number of Toilets	Household / Toilet	Number of Taps	Households / Tap
Hermanus	Marikana (Area of church)	3 222	14	46.0	8	73.2
	Marikana (Next to swimming pool)		22		16	
	Marikana (Next to recycling site)		22		16	
	Marikana (Next to parking area)		12		4	
	Dubai (Schulphoek)	1 800	50	36.0	29	62.1
	Back of sport ground, Zwelihle	173	24	7.2	21	8.2
Kleinmond	Overhills	393	18	21.8	4	98.3
Gansbaai	Masakhane (Next to primary school and portion of new housing project)	898	62	14.5	26	34.5
Sub-Total		**6 486**	**224**	**29.0**	**124**	**52.3**

Notes: No Services, Ratios above Targets, Ratios meeting Targets

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

Table A.2.17: Number of Consumer Units for Water Services for each User Category for the Last Eight Financial Years

Distribution System	Residential	Commercial	Industrial	Other	Total
2013/2014 (Average over period December 2013 – June 2014)					
Buffels River	3 226	109	0	37	**3 372**
Kleinmond	3 523	265	0	64	**3 852**
Greater Hermanus	17 647	833	32	324	**18 836**
Stanford	1 137	49	2	14	**1 202**
Greater Gansbaai	4 950	225	4	220	**5 399**
Pearly Beach	1 076	5	0	10	**1 091**
Baardskeerdersbos	63	0	0	3	**66**
Buffeljags Bay	29	0	0	3	**32**
TOTALS	**31 651**	**1 486**	**38**	**675**	**33 850**
2014/2015 (Average over period July 2014 – June 2015)					
Buffels River	3 264	106	0	36	**3 406**
Kleinmond	3 533	264	0	65	**3 862**
Greater Hermanus	18 168	904	31	325	**19 428**
Stanford	1 147	53	2	14	**1 216**
Greater Gansbaai	4 962	225	4	188	**5 378**
Pearly Beach	1 221	5	0	7	**1 234**
Baardskeerdersbos	63	0	0	3	**66**
Buffeljags Bay	30	0	0	4	**34**
TOTALS	**32 388**	**1 557**	**37**	**642**	**34 624**
2015/2016 (Average over period July 2015 – June 2016)					
Buffels River	3 316	110	0	31	**3 457**
Kleinmond	3 553	263	0	64	**3 880**
Greater Hermanus	18 305	999	32	308	**19 644**
Stanford	1 156	54	2	17	**1 229**
Greater Gansbaai	5 034	228	4	198	**5 464**
Pearly Beach	1 254	4	0	7	**1 265**
Baardskeerdersbos	64	0	0	3	**67**
Buffeljags Bay	30	0	0	6	**36**
TOTALS	**32 712**	**1 658**	**38**	**634**	**35 042**

Table A.2.17: Number of Consumer Units for Water Services for each User Category for the Last Eight Financial Years					
Distribution System	**Residential**	**Commercial**	**Industrial**	**Other**	**Total**
2016/2017 (Average over period July 2016 – June 2017)					
Buffels River	3 362	118	0	30	**3 510**
Kleinmond	3 585	292	0	66	**3 943**
Greater Hermanus	18 788	1 004	37	346	**20 175**
Stanford	1 187	55	2	18	**1 262**
Greater Gansbaai	5 091	234	3	202	**5 530**
Pearly Beach	1 500	3	0	7	**1 510**
Baardskeerdersbos	64	0	0	3	**67**
Buffeljags Bay	30	0	0	6	**36**
TOTALS	**33 607**	**1 706**	**42**	**678**	**36 033**
2017/2018 (Average over period July 2017 – June 2018)					
Buffels River	3 416	118	0	30	3 564
Kleinmond	3 606	295	0	70	3 971
Greater Hermanus	19 460	1 039	38	499	21 036
Stanford	1 227	56	3	18	1 304
Greater Gansbaai	5 213	286	5	197	5 701
Pearly Beach	1 691	5	0	8	1 704
Baardskeerdersbos	64	0	0	3	67
Buffeljags Bay	30	0	0	6	36
TOTALS	**34 707**	**1 799**	**46**	**831**	**37 383**
2018/2019 (Average over period July 2018 – June 2019)					
Buffels River	3 501	119	0	30	3 650
Kleinmond	3 625	297	0	71	3 993
Greater Hermanus	19 819	1 161	38	532	21 550
Stanford	1 260	65	3	20	1 348
Greater Gansbaai	5 761	346	9	196	6 312
Pearly Beach	1 647	8	0	8	1 663
Baardskeerdersbos	64	1	0	3	68
Buffeljags Bay	30	0	0	6	36
TOTALS	**35 707**	**1 997**	**50**	**866**	**38 620**
2019/2020 (Average over period July 2019 – June 2020)					
Buffels River	3 558	119	0	30	3 707
Kleinmond	3 633	307	1	71	4 012
Greater Hermanus	20 099	1 209	38	541	21 887
Stanford	1 269	76	3	18	1 366
Greater Gansbaai	5 917	375	9	198	6 499
Pearly Beach	1 657	9	0	8	1 674
Baardskeerdersbos	65	2	0	3	70
Buffeljags Bay	30	0	0	6	36
TOTALS	**36 228**	**2 097**	**51**	**875**	**39 251**
2020/2021 (Estimated)					
Buffels River	3 623	120	0	30	3 773
Kleinmond	3 649	312	1	73	4 035
Greater Hermanus	20 536	1 278	39	605	22 458
Stanford	1 295	84	3	18	1 400
Greater Gansbaai	6 194	421	11	196	6 822
Pearly Beach	1 710	11	0	8	1 729
Baardskeerdersbos	66	2	0	3	71
Buffeljags Bay	30	0	0	6	36
TOTALS	**37 103**	**2 227**	**54**	**940**	**40 324**

Table A.2.18: Total Number of Consumer Units per Town and Percentage Growth from 2013/2014 to 2020/2021									
Distribution System	**Annual Growth % 13/14 – 20/21**	**13/14**	**14/15**	**15/16**	**16/17**	**17/18**	**18/19**	**19/20**	**20/21***
Buffels River	1.62%	3 372	3 406	3 457	3 510	3 564	3 650	3 707	3 773
Kleinmond	0.67%	3 852	3 862	3 880	3 943	3 971	3 993	4 012	4 035
Greater Hermanus	2.54%	18 836	19 428	19 644	20 175	21 036	21 550	21 887	22 458
Stanford	2.20%	1 202	1 216	1 229	1 262	1 304	1 348	1 366	1 400
Greater Gansbaai	3.40%	5 399	5 378	5 464	5 530	5 701	6 312	6 499	6 822
Pearly Beach	6.80%	1 091	1 234	1 265	1 510	1 704	1 663	1 674	1 729
Baardskeerdersbos	1.05%	66	66	67	67	67	68	70	71
Buffeljags Bay	1.70%	32	34	36	36	36	36	36	36
TOTALS	**2.53%**	**33 850**	**34 624**	**35 042**	**36 033**	**37 383**	**38 620**	**39 251**	**40 324**

Note: Number of CUs for 2020/2021 was estimated.

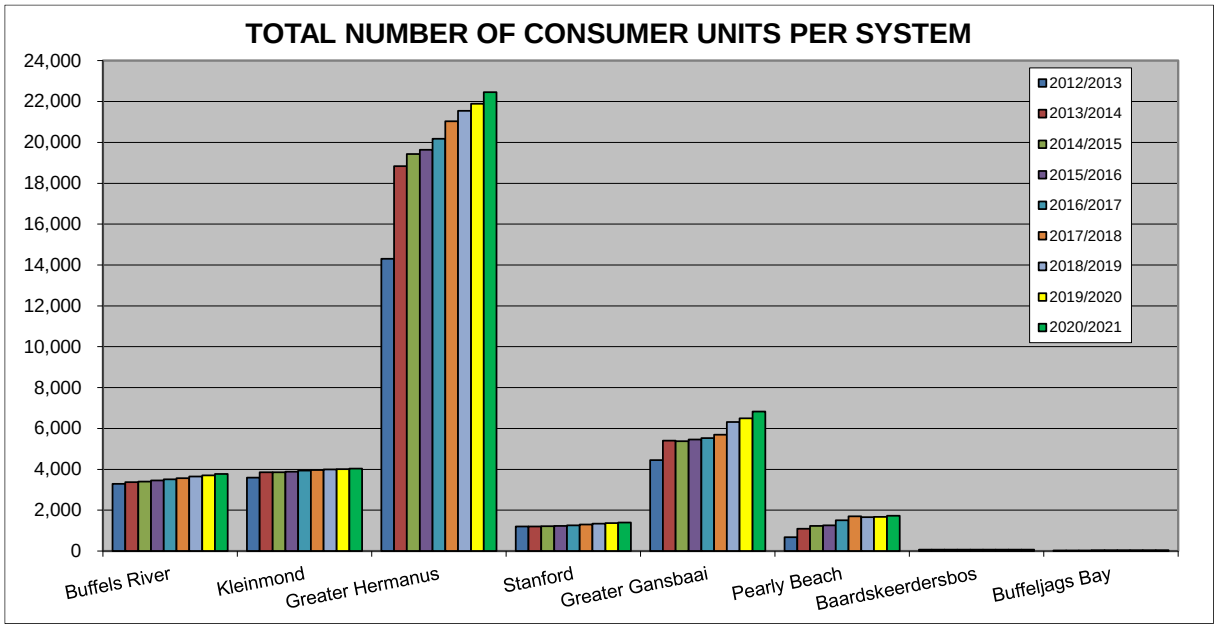


Figure A.2.3: Number of Billed Metered Consumption Units per System for the Last Nine Financial Years

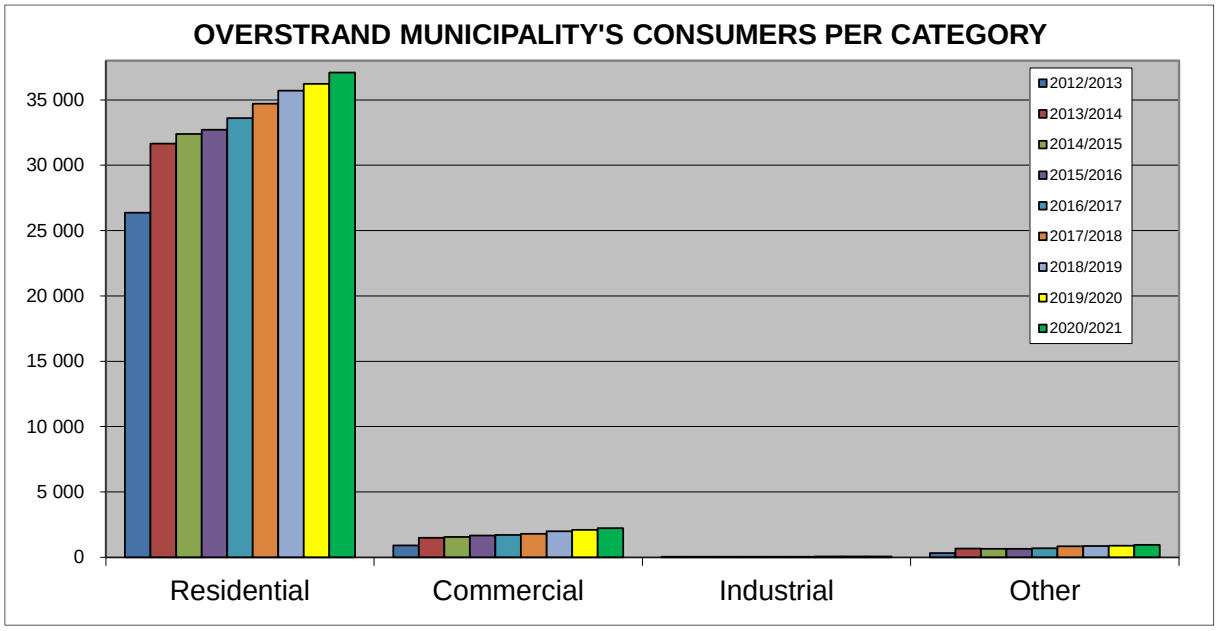


Figure A.2.4: Overstrand Municipality's Consumers per Category Type

Public Amenities

All schools and medical facilities in Overstrand Municipality's Management Area are supplied with a higher level of water and sanitation services. The existing water and sanitation service levels for all the schools and medical facilities in Overstrand Municipality's Management Area are summarised in the tables below.

Table A.2.19: Water Service Levels: Education and Health Facilities

Associated services facility	Number of facilities	Facilities with No Services	Facilities with Inadequate Services	Total Potential Cost (basic level) (RM)
Education Plan				
Primary school	17	0	0	R0
Secondary school	4	0	0	R0
Tertiary	-	-	-	-
Combined	4	0	0	R0
Special needs	1	0	0	R0
Other	13	0	0	R0
Total	**39**		**0**	**R0**
Health Plan				
Hospitals	2	0	0	R0
Community Day Centres	1	0	0	R0
Clinics	10	0	0	R0
Other	-	-	-	-
Total	**13**	**0**	**0**	**R0**

Table A.2.20: Sanitation Service Levels: Education and Health Facilities

Associated services facility	Number of facilities	Facilities with No Services	Facilities with Inadequate Services	Total Potential Cost (basic level) (RM)
Education Plan				
Primary school	17	0	0	R0
Secondary school	4	0	0	R0
Tertiary	-	-	-	-
Combined	4	0	0	R0
Special needs	1	0	0	R0
Other	13	0	0	R0
Total	**39**	**0**	**0**	**R0**
Health Plan				
Hospitals	2	0	0	R0
Community Day Centres	1	0	0	R0
Clinics	10	0	0	R0
Other	-	-	-	-
Total	**13**	**0**	**0**	**R0**

TOPIC 3: WATER SERVICES ASSET MANAGEMENT

A new Water and Wastewater Bulk Works Contract was signed during the 2018/2019 financial year between Overstrand Municipality and an External Service Provider to operate the bulk water services infrastructure in Overstrand Municipality's Management Area for a period of fifteen (15) years starting on the 8th of December 2018. The Municipality also has the right to extend the contract for a further five (5) years. The Municipality will ensure the long-term efficient operation and maintenance of their bulk water and sewerage infrastructure through the Contract.

The operation and maintenance of the following bulk infrastructure forms part of the Contract:

- Hawston, Hermanus, Stanford, Gansbaai, Kleinmond and Eluxolweni WWTWs;
- Preekstoel, Buffels River, Franskraal, Pearly Beach, De Kelders, Stanford, Kleinmond, Baardskeerdersbos and Buffeljags Bay WTWs;
- Water Resources;
- Surface water pump stations and borehole pumps;
- Bulk water and sewer pipelines;
- Water Reservoirs; and
- Water and sewer pump stations and rising main pipelines.

Table A.3.1: Infrastructure Components

Assets	Boreholes	Abstraction Points	WTW	Water Pump Stations	Sewer Pump Stations	Water Bulk Pipelines	Sewer Bulk Pipelines	Reservoirs	WWTW	Assessment Score
Total number of components / km of pipeline / units	20	12	8	25	53	119 km	48.3 km (Rising)	46	6	80%

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

Table A.3.2: Existing Main Water Infrastructure (Resources and WTWs)

Water Distribution System	Bulk Supply	WTWs and Treatment Processes	
	(Resources)	WTW (Capacity in Ml/d)	Processes
Buffels River	Buffels River Dam	Buffels River (5.500)	Chemical dosing (Aluminium Chlorohydrate), flocculation, sedimentation, filtration (Rapid gravity sand filters), stabilization (Soda Ash) and disinfection (Chlorine Gas)
Kleinmond	Palmiet River, Kleinmond Borehole & Dorpsfontein Spring	Kleinmond (5.800)	Chemical dosing (Aluminium Chlorohydrate and Soda Ash), flocculation, sedimentation, filtration (Rapid gravity sand filters), stabilization (Soda Ash) and disinfection (Chlorine Gas).
Greater Hermanus	De Bos Dam and Gateway, Camphill and Volmoed wellfields	Preekstoel (21.000)	Chemical dosing (Aluminium Sulphate and Sodium Aluminate), flocculation, sedimentation, filtration (Rapid gravity sand filters), stabilization (Lime) and Disinfection (Chlorine Gas)
		Groundwater Hemel & Aarde (10.000)	Biological WTW for iron and manganese removal by contact filtration, Caustic Soda dosing and Aeration (Hemel & Aarde).
		Groundwater Gateway (7.000)	Chemical oxidation treatment plant with Potassium Permanganate and Aeration (Gateway Wellfield).
Stanford	Stanford Spring and two Kouevlakte Boreholes	Stanford RO plant (1.000)	Ultrafiltration plus Reverse Osmosis Plant and disinfection (Sodium Hypochlorite)
Greater Gansbaai	Franskraal and Kraaibosch Dams	Franskraal (6.500)	Chemical dosing (Aluminium Chlorohydrate), flocculation, sedimentation, filtration (Rapid gravity sand filters), disinfection (Chlorine Gas) and stabilization (Soda Ash)
	Klipgat Fountain and De Kelders Caves Fountain.	De Kelders (1.600)	Ultrafiltration plus Reverse Osmosis Plant and disinfection (Sodium Hypochlorite)
Pearly Beach	Pearly Beach Springs and Koekemoer Dam	Pearly Beach (1.440)	DAFF pre-treatment, Ultrafiltration Modules from Memcor, Chemical dosing (Sudfloc K300) and disinfection (Sodium Hypochlorite)
Baardskeerders-bos	Two Boreholes	Baardskeerdersbos (0.185)	pH adjustment, oxidation, settling, ultrafiltration and disinfection (Sodium Hypochlorite).
Buffeljags Bay	Borehole	-	Disinfection (Chlorine Tablets)

Table A.3.3: Existing Main Water Infrastructure (Reticulation, Pump Stations and Reservoirs)						
Water Distribution System	Water Distribution Networks		Number of Water PS		Reservoirs and Water Towers	
	Bulk	Internal	Raw Water	Potable Water	Number of Reservoirs & Water Towers	Total Storage in Ml
	km	km	Number of PS	Number of PS		
Buffels River	15.326	123.859	-	4	6	6.267
Kleinmond	5.400	75.053	3	1	3	8.100
Greater Hermanus	41.586	328.807	1	6	21	38.446
Stanford	5.564	34.501	-	2	2	2.750
Greater Gansbaai	35.299	140.970	3	2	10	13.050
Pearly Beach	12.404	30.969	-	2	2	2.300
Baardskeerdersbos	0.858	4.952	-	1	1	0.150
Buffeljags Bay	2.575	0.469	-	-	1	0.096
Total Overstrand	**119.012**	**739.580**	**7**	**18**	**46**	**72.544**

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

Table A.3.4: Existing Main Sewerage Infrastructure							
Sewer Drainage Systems	WWTWs and Treatment Processes			Sewer Drainage Network		Number of Sewer PS	
	Hydraulic Capacity	Organic Capacity	Treatment Processes	Rising	Gravity	Mun	Private
	Ml/d	kg COD/d		km	km		
Buffels River	-	-	-	-	-	-	-
Kleinmond	0.997	843	Kleinmond Activated Sludge System	6.841	29.902	6	1
Greater Hermanus	0.700	968	Hawston Activated Sludge System	33.041	257.684	33	2
	12.000	9 000	Hermanus Activated Sludge System				
Stanford	1.200	1 200	Stanford Activated Sludge System	3.242	29.752	4	2
Greater Gansbaai	2.000	3 600	Gansbaai Nereda System	4.282	24.686	3	-
Pearly Beach	0.259	198	Eluxolweni Oxidation Pond System	0.941	5.245	1	1
Baardskeerdersbos	-	-	-	-	-	-	-
Buffeljags Bay	-	-	-	-	-	-	-
Total Overstrand				**48.347**	**347.269**	**47**	**6**

Rooi Els, Pringle Bay, Betty's Bay, De Kelders, Franskraal and are not currently serviced by a sewer reticulation system. The towns of Kleinmond, Fisherhaven, Hawston, Stanford, Gansbaai, Kleinbaai and Pearly Beach are partially serviced by a sewer system.

Table A.3.5: 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	1	2	13	4	20	0	0	0	0	18	2	0
Abstraction points	0	2	4	6	12	0	0	0	0	7	5	0
Bulk water pipelines	0	2	6	0	8	0	0	0	0	8	0	0
Reservoirs	0	9	24	15	48	0	0	0	0	43	5	0
Water pump stations	1	9	10	5	25	0	0	0	0	24	1	0
WTW	0	2	5	1	8	0	0	0	0	6	2	0
Bulk sewer pipelines	0	0	5	0	5	0	0	0	0	5	0	0
Sewer pump stations	2	14	23	18	57	0	0	0	0	55	2	0
WWTW	0	3	3	0	6	0	0	0	0	5	1	0

Asset Management: An Asset Management Policy and a Maintenance Management Policy are in place for Overstrand Municipality. The objectives of the Asset Management Policy are to ensure the effective and efficient control of the municipality's assets. The Maintenance Management Policy applies to the ongoing maintenance of infrastructure assets, which include all water and sanitation assets.

An Asset Maintenance Plan was completed with the 2014 asset register used as the basis for the plan. The maintenance plans developed provide the municipality with a basis for establishing a planned maintenance approach for the municipality's full asset base. Funding requirements for the maintenance needs are based on the guidelines of the National Infrastructure Maintenance Strategy, which is based on a % of the value of the assets of the respective services.

Overstrand Municipality updated their current Asset Register after June 2021, in order to include the new assets constructed during the 2020/2021 financial year. The tables and graphs below give an overview of the current water and sewerage infrastructure included in Overstrand Municipality's Asset Register.

Water Infrastructure: The current replacement cost and carrying value of the water infrastructure of Overstrand Municipality is summarised in the table below (June 2021).

Table A.3.6: Current Replacement Cost and Carrying Value of the Water Infrastructure - June 2021

Asset Type	CRC	CV	% CV / CRC
Dams	R14 705 474	R4 772 322	32.5%
Boreholes	R11 619 334	R17 780 137	153.0%
Bulk Water Pipelines	R127 451 002	R40 235 212	31.6%
Pump Stations	R49 260 105	R13 899 259	28.2%
Reservoirs	R121 154 025	R71 419 518	58.9%
Water Reticulation Pipelines	R681 501 128	R192 065 029	28.2%
Buffels River WTW	R13 813 820	R3 892 209	28.2%
Kleinmond WTW	R27 568 183	R9 104 785	33.0%
Preekstoel WTW	R78 510 492	R64 803 488	82.5%
Franskraal New WTW	R36 743 472	R19 675 959	53.5%
Franskraal Old WTW	R20 036 738	R3 759 087	18.8%
Baardskeerdersbos WTW	R6 724 089	R3 780 969	56.2%
Pearly Beach WTW	R8 154 514	R4 534 416	55.6%
De Kelders WTW	R18 982 042	R7 196 135	37.9%
Totals	**R1 216 224 418**	**R456 918 525**	**37.6%**

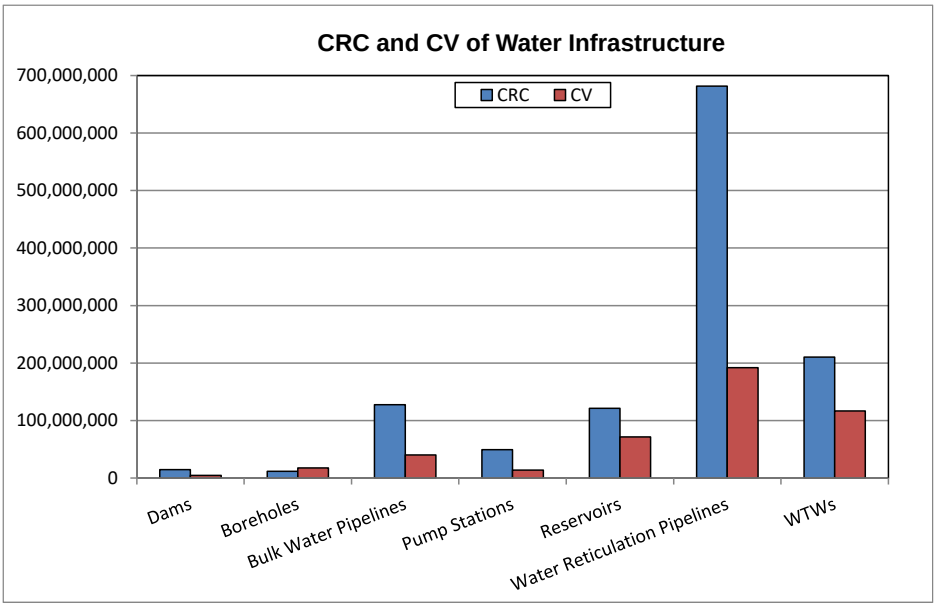


Figure A.3.1: CRC and CV of the Water Infrastructure

The information in the previous table indicates that 62.4% of the value of the water infrastructure has been consumed.

The following table and graph gives an overview of the RUL by facility type for the water infrastructure (CRC).

Table A.3.7: Overview of the Remaining Useful Life by Facility Type for the Water Infrastructure – June 2021 (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Dams	R3 707 448	R557 118	R0	R9 360 831	R1 080 077
Boreholes	R5 963 219	R787 096	R0	R476 057	R4 392 962
Bulk Water Pipelines	R66 570 774	R1 975 841	R0	R0	R58 904 387
Pump Stations	R25 856 583	R4 789 152	R204 564	R9 921 586	R8 488 220
Reservoirs	R11 824 459	R6 170 450	R390 685	R74 522 769	R28 245 662
Water Reticulation Pipelines	R438 576 815	R21 947 656	R0	R0	R220 976 657
Buffels River WTW	R4 083 118	R1 735 086	R0	R7 990 365	R5 251
Kleinmond WTW	R3 523 735	R422 128	R18 819	R16 563 102	R7 040 399
Preekstoel WTW	R2 890 473	R12 716 435	R976 366	R1 210 941	R60 716 277
Franskraal New WTW	R14 517 295	R354 761	R63 424	R446 210	R21 361 782
Franskraal Old WTW	R5 320 555	R2 260 796	R6 955	R12 448 432	R0
Baardskeerdersbos WTW	R10 486	R5 198 392	R65 430	R0	R1 449 781
Pearly Beach WTW	R584 561	R4 727 115	R101 165	R279 874	R2 461 799
De Kelders WTW	R86 730	R12 488 801	R0	R242 892	R6 163 619
Totals	**R583 516 251**	**R76 130 827**	**R1 827 408**	**R133 463 059**	**R421 286 873**

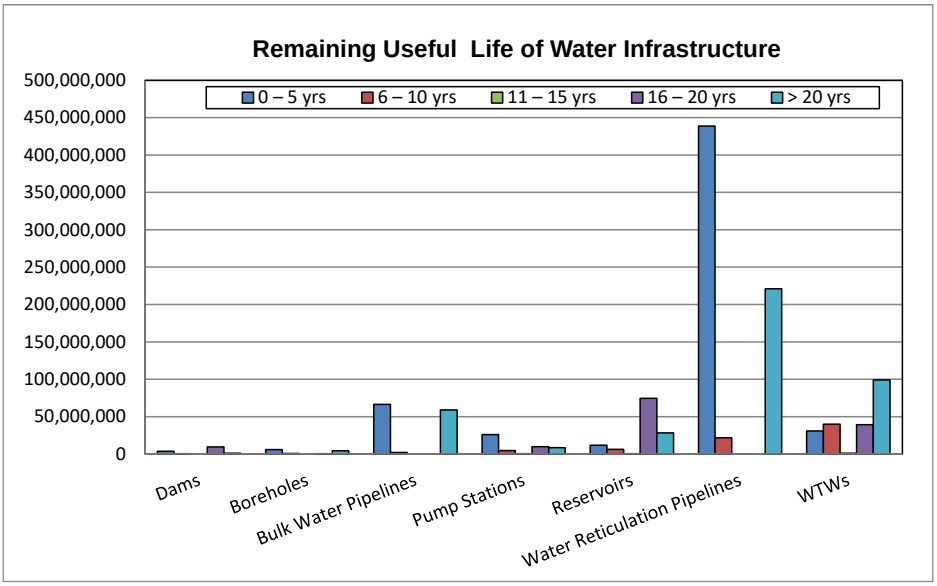


Figure A.3.2: Remaining Useful Life of the Water Infrastructure

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

Table A.3.8: Overview of the Age Distribution by Facility Type for the Water Infrastructure – June 2021 (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Dams	R549 065	R0	R142 825	R0	R14 013 584
Boreholes	R139 815	R964 068	R9 805 072	R146 652	R563 727
Bulk Water Pipelines	R0	R7 916 008	R17 231 912	R0	R102 303 082
Pump Stations	R8 053	R238 775	R25 212 367	R10 381 354	R13 419 556
Reservoirs	R1 199 883	R1 407 859	R14 503 653	R21 003 014	R83 039 616
Water Reticulation Pipelines	R3 182 307	R39 309 422	R237 846 998	R0	R401 162 401
Buffels River WTW	R364 073	R0	R4 081 050	R99 143	R9 269 554
Kleinmond WTW	R0	R0	R5 138 930	R5 649 745	R16 779 508

Table A.3.8: Overview of the Age Distribution by Facility Type for the Water Infrastructure – June 2021 (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Preekstoel WTW	R0	R75 632 233	R2 345 953	R532 306	R0
Franskraal New WTW	R0	R31 823	R36 711 649	R0	R0
Franskraal Old WTW	R0	R0	R562 970	R4 570 227	R14 903 541
Baardskeerdersbos WTW	R0	R6 724 089	R0	R0	R0
Pearly Beach WTW	R0	R0	R6 492 007	R1 294 719	R367 788
De Kelders WTW	R0	R18 982 042	R0	R0	R0
Totals	**R5 443 196**	**R151 206 319**	**R360 075 386**	**R43 677 160**	**R655 822 357**

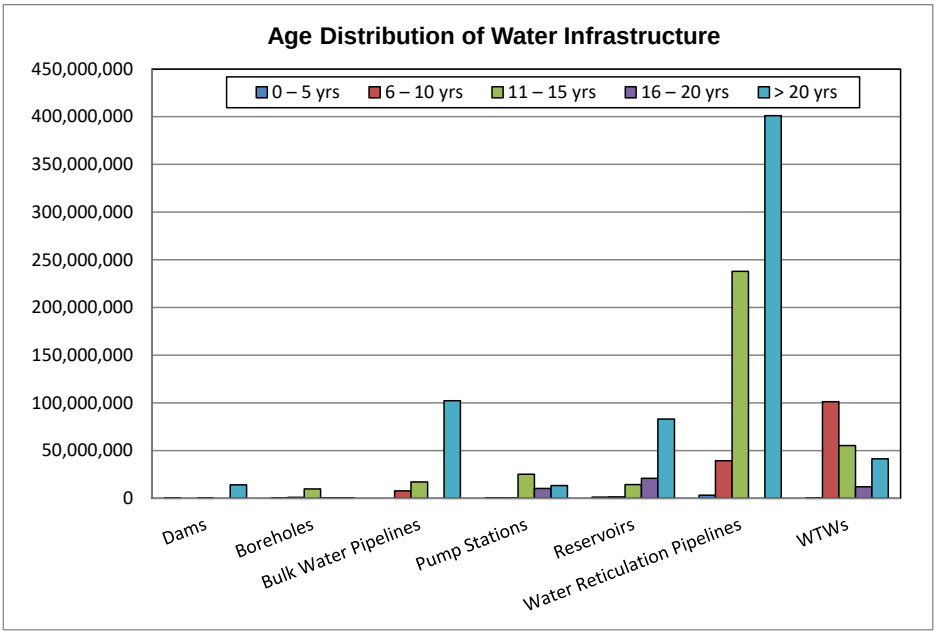


Figure A.3.3: Age Distribution of the Water Infrastructure

The following table and graph gives an overview of the condition grading by facility type for the water infrastructure (CRC).

Table A.3.9: Overview of the Condition Grading by Facility Type for the Water Infrastructure – June 2021 (CRC)					
Asset Type	**Very Poor**	**Poor**	**Fair**	**Good**	**Very Good**
Dams	R0	R3 572 676	R10 575 680	R8 053	R549 065
Boreholes	R338 902	R78 365	R8 652 138	R2 533 634	R16 295
Bulk Water Pipelines	R66 198 631	R1 975 841	R26 320 613	R9 505 682	R23 450 235
Pump Stations	R930 004	R6 103 315	R31 217 742	R10 752 696	R256 348
Reservoirs	R6 020 645	R3 691 538	R80 410 361	R30 246 276	R785 205
Water Reticulation Pipelines	R307 354 345	R21 947 656	R183 106 914	R34 745 303	R134 346 910
Buffels River WTW	R0	R409 206	R12 947 079	R93 462	R364 073
Kleinmond WTW	R7 164	R3 168	R20 299 016	R5 851 745	R1 407 090
Preekstoel WTW	R0	R550 608	R16 234 675	R40 817 863	R20 907 346
Franskraal New WTW	R0	R0	R17 688 050	R18 219 366	R836 056
Franskraal Old WTW	R817 309	R6 142 278	R13 077 151	R0	R0
Baardskeerdersbos WTW	R0	R0	R555 518	R2 244 433	R3 924 138
Pearly Beach WTW	R0	R0	R914 226	R3 061 412	R4 178 876
De Kelders WTW	R0	R0	R5 815 836	R1 969 276	R11 196 930
Totals	**R381 667 000**	**R44 474 651**	**R427 814 999**	**R160 049 201**	**R202 218 567**

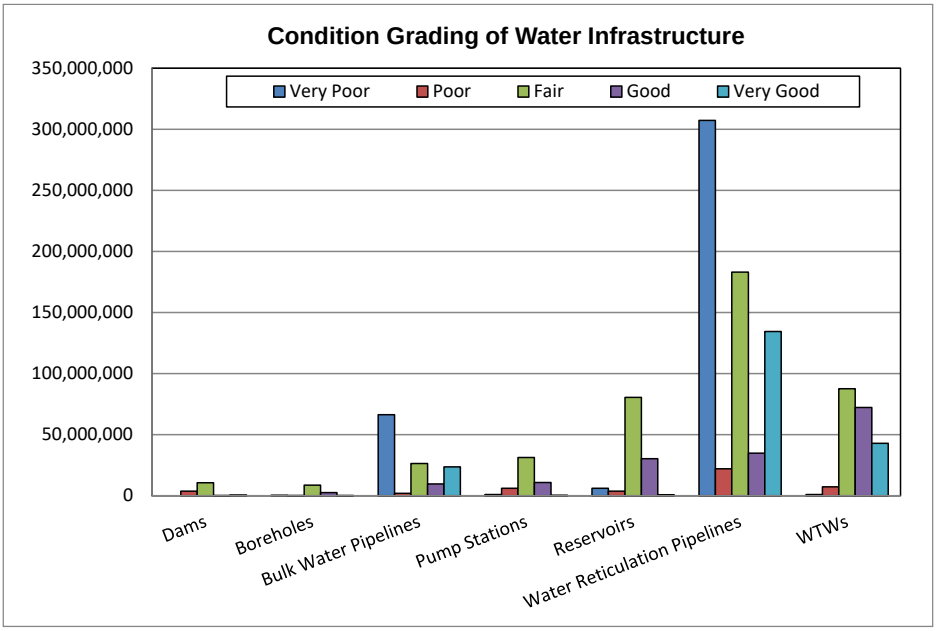


Figure A.3.4: Condition Grading of the Water Infrastructure

Sewerage Infrastructure: The current replacement cost and carrying value of the sewerage infrastructure of Overstrand Municipality is summarised in the table below (June 2021).

Table A.3.10: Current Replacement Cost and Carrying Value of the Sewerage Infrastructure – June 2021

Asset Type	CRC	CV	% CV / CRC
Sanitation Pump Stations	R40 575 653	R32 973 610	81.3%
Sewer Reticulation Pipelines	R419 511 626	R265 012 351	63.2%
Stanford WWTW	R18 563 529	R22 881 486	123.3%
Hermanus WWTW	R75 955 143	R34 975 279	46.0%
Hawston WWTW	R13 438 372	R5 082 029	37.8%
Kleinmond WWTW	R13 448 933	R4 944 784	36.8%
Gansbaai WWTW	R34 154 633	R11 048 054	32.3%
Pearly Beach WWTW	R11 060 449	R6 439 572	58.2%
Totals	**R626 708 338**	**R383 357 165**	**61.2%**

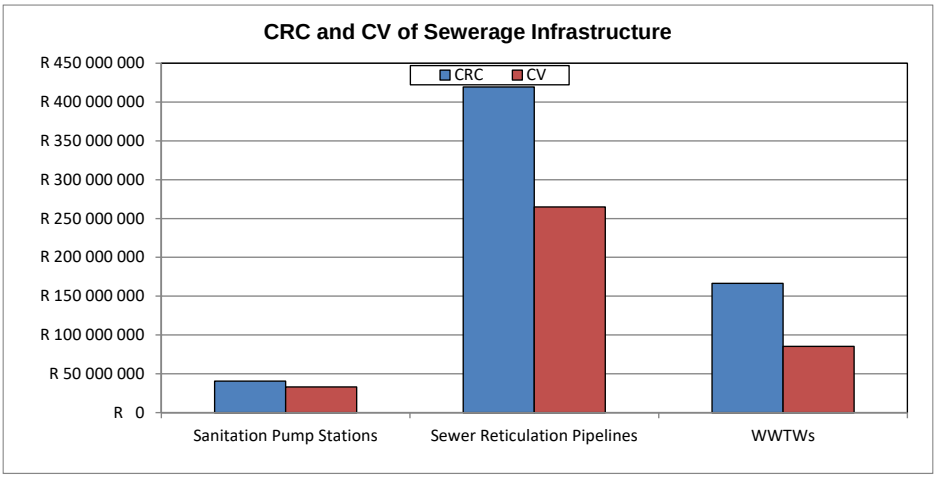


Figure A.3.5: CRC and CV of the Sewerage Infrastructure

The information in the previous table indicates that 38.8% of the value of the sewerage infrastructure has been consumed.

The following table and graph gives an overview of the RUL by facility type for the sewerage infrastructure (CRC):

Table A.3.11: Overview of the Remaining Useful Life by Facility Type for the Sewerage Infrastructure – June 2021 (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Sanitation Pump Stations	R16 614 584	R7 684 319	R8 139	R12 631 696	R3 636 915
Sewer Reticulation Pipelines	R4 663 675	R44 560 766	R12 710 160	R20 256 059	R337 320 966
Stanford WWTW	R4 790 570	R6 445 422	R2 561	R5 972 960	R1 352 016
Hermanus WWTW	R9 507 599	R41 967 267	R206 768	R10 427 613	R13 845 896
Hawston WWTW	R4 042 978	R4 175 636	R2 848	R2 331 608	R2 885 302
Kleinmond WWTW	R5 162 580	R3 038 245	R9 275	R2 308 627	R2 930 206
Gansbaai WWTW	R18 083 638	R5 952 621	R68 782	R3 941 562	R6 108 030
Pearly Beach WWTW	R85 365	R409 067	R292 620	R0	R10 273 397
Totals	**R62 950 989**	**R114 233 343**	**R13 301 153**	**R57 870 125**	**R378 352 728**

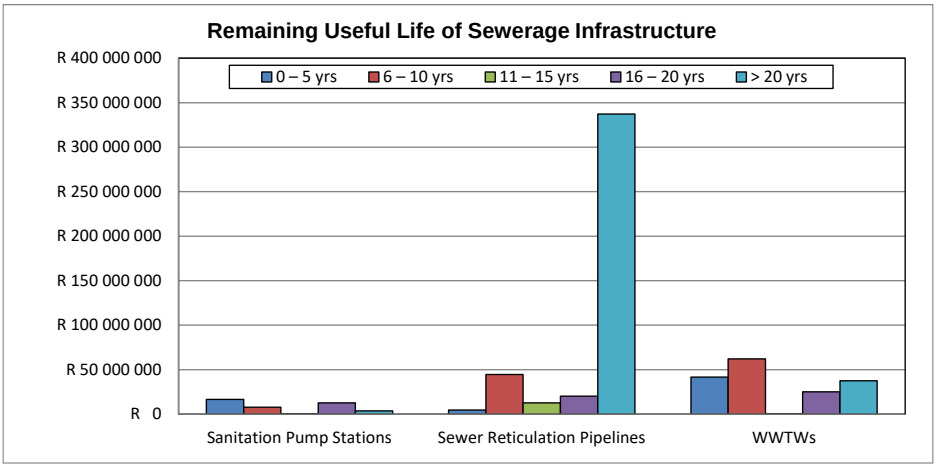


Figure A.3.6: Remaining Useful Life of the Sewerage Infrastructure

The following table and graph gives an overview of the age distribution by facility type for the sewerage infrastructure (CRC).

Table A.3.12: Overview of the Age Distribution by Facility Type for the Sewerage Infrastructure – June 2021 (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
Sanitation Pump Stations	R609 485	R8 942 929	R17 510 443	R856 740	R12 656 056
Sewer Reticulation Pipelines	R6 517 820	R23 338 216	R43 123 824	R16 795 649	R329 736 117
Stanford WWTW	R0	R0	R10 602 838	R969 231	R6 991 460
Hermanus WWTW	R256 225	R50 033 091	R3 915 537	R2 892 933	R18 857 357
Hawston WWTW	R0	R0	R8 648 079	R2 064 571	R2 725 722
Kleinmond WWTW	R0	R2 290 287	R5 496 630	R3 250 853	R2 411 163
Gansbaai WWTW	R0	R5 892 037	R14 326 706	R8 250 659	R5 685 231
Pearly Beach WWTW	R0	R11 060 449	R0	R0	R0
Totals	**R7 383 530**	**R101 557 009**	**R103 624 057**	**R35 080 636**	**R379 063 106**

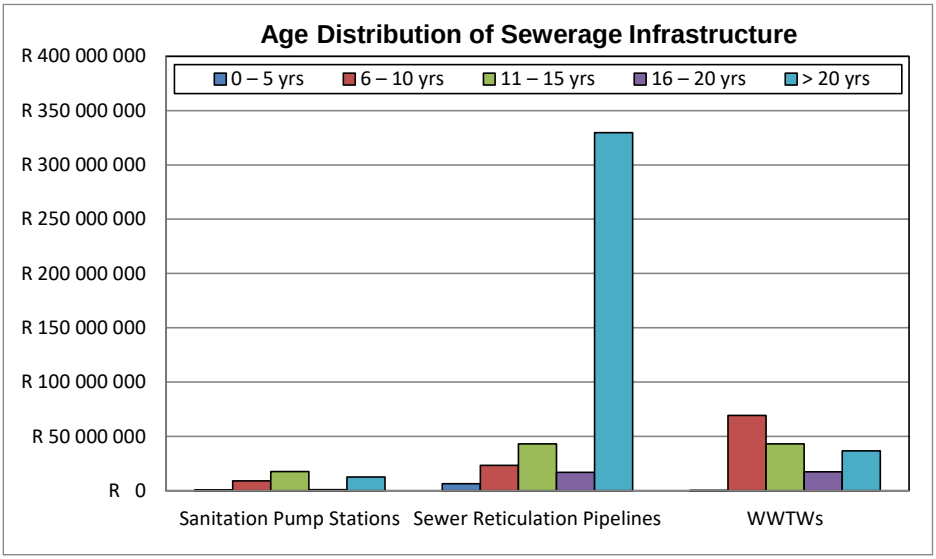


Figure A.3.7: Age distribution of the Sewerage Infrastructure

The following table and graph gives an overview of the condition grading by facility type for the sewerage infrastructure (CRC).

Table A.3.13: Overview of the Condition Grading by Facility Type for the Sewerage Infrastructure – June 2021 (CRC)

Asset Type	Very Poor	Poor	Fair	Good	Very Good
Sanitation Pump Stations	R17 965	R38 148	R32 648 102	R3 316 271	R4 555 167
Sewer Reticulation Pipelines	R4 663 675	R60 105 949	R165 685 405	R144 250 219	R44 806 378
Stanford WWTW	R0	R1 063 582	R11 149 555	R6 350 392	R0
Hermanus WWTW	R8 869 373	R1 802 042	R38 652 034	R17 996 344	R8 635 350
Hawston WWTW	R0	R199 283	R6 585 074	R4 864 349	R1 789 666
Kleinmond WWTW	R25 913	R15 528	R6 906 032	R6 501 460	R0
Gansbaai WWTW	R4 768 779	R722 846	R20 519 979	R6 057 553	R2 085 476
Pearly Beach WWTW	R0	R58 022	R0	R162 383	R10 840 044
Totals	**R18 345 705**	**R64 005 400**	**R282 146 181**	**R189 498 971**	**R72 712 081**

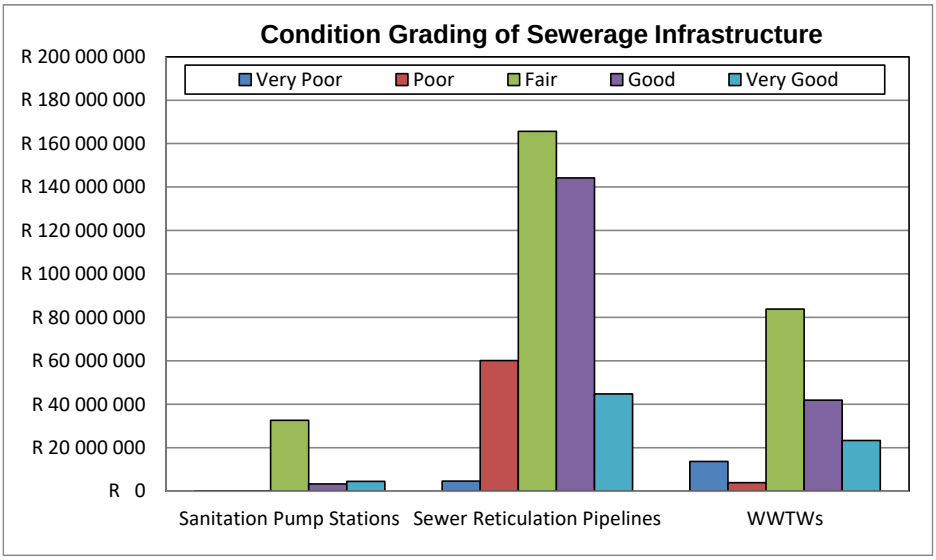


Figure A.3.8: Condition Grading of the Sewerage Infrastructure

The CRC of the water and sewerage infrastructure that will need to be replaced over the next five years (RUL <5 yrs) is R646.467 million. The asset renewal needs for the **water infrastructure assets** over the next 10 years is R65.965 million per year. The reinvestment required is R583.516 million in the first 5 years and R76.130 million in the second 5-year period. The age of 53.9% of the water infrastructure assets is greater than 20 years. The CRC of the water infrastructure with a condition grading of "Very Poor" is R381.667 million. The asset renewal needs for the **sewerage infrastructure assets** over the next 10 years is R17.718 million per year. The reinvestment required is R62.950 million in the first 5 years and R114.233 million in the second 5-year period. The age of 60.5% of the sewerage infrastructure assets is greater than 20 years. The CRC of the sewerage infrastructure with a condition grading of "Very Poor" is R18.346 million.

Some of the key challenges of Overstrand Municipality are to secure adequate funds for the rehabilitation and maintenance of their existing infrastructure, which is critical to ensure the sustainability of the services that are provided by the Municipality. The Water and Waste Water Bulk Works Contract ensures that the new technology installed is adequately maintained and operated in order to prevent a massive increase in maintenance in the future due to backlogs being created (Objective is asset preservation). This Bulk Works Contract addresses the capacity constraints, the Municipality previously experienced, with regard to the operation of the WTWs and WWTWs (Objectives are skills development and retention and long term improvement of efficiency of operations).

It is very important for the Municipality to secure adequate funding for major refurbishment and maintenance work, the provision of bulk infrastructure and development of additional sources to keep up with the growing demand for services.

Disaster Management Plan: An updated 2020/2021 Disaster Management Plan is available for Overstrand Municipality, which forms an integral part of the Municipality's IDP and anticipate the types of disasters that are likely to occur in the municipal area as well as their possible effects. The Disaster Management Plan place emphasis on measures that reduce the vulnerability of disaster prone areas, communities and households.

Overstrand Municipality has a functional Fire and Disaster management Department within the Directorate: Protection Services. A Joint Operation Centre (JOC) is activated as and when the need arises. The JOC is operated from the Fire station in Hermanus. No Disaster Management Advisory Forum is established, because a committee already exists which plays a similar role.

Untreated Effluent Management Plan: All effluent discharged in the urban areas in Overstrand Municipality are treated at the existing WWTWs and there is no known untreated effluent discharged to the environment. A W_2RAP is in place for all the wastewater treatment systems.

TOPIC 4: WATER SERVICES OPERATION AND MANAGEMENT

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.

The existing Water and Waste Water Bulk Works Contract assist with the efficient operation and maintenance of all the bulk water and sewerage infrastructure in Overstrand Municipality's Management Area.

Pipe bursts and other serious damage to pipes immediately interrupts services to the affected area and is rapidly addressed by Overstrand Municipality. O&M is a continuous process for Overstrand 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. Overstrand Municipality's O&M Plan depends on a range of factors such as the age and condition of the water supply system, requirements of the Municipality and DWS as the regulating authority, the availability of staff, plant, equipment, spares, money and other resources.

Overstrand Municipality and the Contractor responsible for the Bulk Works Contract 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 Overstrand Municipality to be able to quickly assess service breakdowns and re-allocate staff and resources to do unscheduled repairs, and then quickly return to the regular and scheduled O&M activities. The Municipality and the Contractor also ensure that sufficient repair materials, consumables and back-up equipment are also readily available for any potential breakdowns.

Table A.4.1: Operation and Maintenance

Compliancy	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	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement
Information	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement
Activity Control & Management	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement	Above min. requirement

TOPIC 5: CONSERVATION AND DEMAND MANAGEMENT

The implementation of the Municipality's WDM Strategy and Action Plan have been extremely successful, with the overall raw water requirements for all the systems reduced from 9 206 Ml in 2008/2009 to 7 028 Ml in 2011/2012 (annual decrease of -8.6% over three-year period) and a further steady increase over the last nine years to 7 987 Ml in 2020/2021 (average annual increase of 1.43% over last nine years). The overall NRW for all the systems for the 2020/2021 financial year was 2 077 Ml (28.26%). The overall water losses were 1 997 Ml (27.17%).

The table below give a summary of the Treatment Losses, NRW, Water Losses and ILIs for the various distribution systems, as calculated through the WSDP process.

Table A.5.1: Treatment Losses, NRW, Water Losses and ILIs for the Various Water Distribution Systems

System	Component	Unit	Record: Prior (Ml/a)					20/21
			15/16	16/17	17/18	18/19	19/20	
Buffels River	Treatment Losses	Volume	54.157	61.541	64.571	60.724	79.606	14.959
		Percentage	7.10%	6.97%	9.94%	7.58%	10.37%	1.94%
	NRW	Volume	327.463	455.126	265.104	407.056	335.271	383.457
		Percentage	46.22%	55.42%	45.31%	54.98%	48.70%	50.60%
	Water Losses	Volume	326.046	453.483	263.934	345.276	302.971	330.845
		Percentage	46.02%	55.22%	45.11%	46.63%	44.01%	43.66%
	ILI		**3.36**	**4.63**	**2.67**	**3.45**	**3.00**	**3.44**
Kleinmond	Treatment Losses	Volume	51.584	68.368	16.091	67.349	73.584	75.267
		Percentage	6.68%	8.33%	2.25%	8.64%	8.19%	8.55%
	NRW	Volume	202.304	203.625	188.379	183.409	276.922	289.372
		Percentage	28.07%	27.06%	26.90%	25.75%	33.57%	35.94%
	Water Losses	Volume	200.863	202.120	186.978	178.280	273.090	282.963
		Percentage	27.87%	26.86%	26.70%	25.03%	33.11%	35.15%
	ILI		**2.49**	**2.48**	**2.28**	**2.17**	**3.30**	**3.11**
Greater Hermanus	Treatment Losses	Volume	572.544	654.274	539.107	487.283	445.591	217.909
		Percentage	12.35%	13.73%	12.89%	11.77%	10.79%	5.14%
	NRW	Volume	474.020	317.045	262.270	332.685	430.532	960.986
		Percentage	11.66%	7.71%	7.20%	9.10%	11.69%	23.88%
	Water Losses	Volume	465.893	308.822	254.983	316.318	416.581	947.239
		Percentage	11.46%	7.51%	7.0%	8.66%	11.31%	23.54%
	ILI		**1.19**	**0.77**	**0.62**	**0.75**	**0.98**	**2.23**
Stanford	Treatment Losses	Volume	85.643	9.125	20.993	53.133	40.381	143.545
		Percentage	22.01%	2.91%	6.53%	14.18%	11.05%	32.15%
	NRW	Volume	73.438	76.937	78.723	90.868	93.141	79.613

Table A.5.1: Treatment Losses, NRW, Water Losses and ILIs for the Various Water Distribution Systems								
System	Component	Unit	Record: Prior (Ml/a)					20/21
			15/16	16/17	17/18	18/19	19/20	
		Percentage	24.19%	25.29%	26.20%	28.25%	28.65%	26.28%
	Water Losses	Volume	72.831	76.329	78.122	87.478	91.463	78.036
		Percentage	23.99%	25.09%	26.00%	27.19%	28.14%	25.76%
	ILI		3.69	3.80	3.81	4.16	4.31	2.27
Greater Gansbaai	Treatment Losses	Volume	74.357	67.191	55.750	66.610	64.025	97.490
		Percentage	7.41%	6.41%	5.02%	5.56%	5.45%	8.69%
		Volume	85.837	95.258	68.287	71.221	69.012	79.262
		Percentage	16.90%	17.93%	16.30%	19.71%	19.68%	22.89%
	NRW	Volume	384.841	529.125	449.900	450.328	390.657	308.492
		Percentage	28.49%	37.33%	32.01%	31.67%	28.07%	23.89%
	Water Losses	Volume	382.139	526.290	447.089	445.817	384.859	303.451
		Percentage	28.29%	37.13%	31.81%	31.35%	27.66%	23.50%
	ILI		3.35	4.58	3.84	3.58	3.03	2.26
Pearly Beach	Treatment Losses	Volume	5.489	10.044	5.860	29.603	4.891	4.756
		Percentage	3.64%	7.04%	4.64%	16.98%	3.15%	3.10%
	NRW	Volume	36.951	21.928	23.495	38.499	46.005	44.318
		Percentage	25.41%	16.54%	19.52%	26.60%	30.57%	29.81%
	Water Losses	Volume	36.660	21.663	23.254	37.760	45.166	43.574
		Percentage	25.21%	16.34%	19.32%	26.09%	30.02%	29.31%
	ILI		1.00	1.43	1.43	2.35	2.81	1.26
Baardskeerdersbos	Treatment Losses	Volume	3.736	2.967	2.446	3.101	2.637	2.603
		Percentage	20.33%	18.52%	14.26%	17.15%	14.40%	14.67%
	NRW	Volume	6.654	5.047	6.752	7.509	6.941	7.918
		Percentage	45.44%	38.67%	45.91%	50.14%	44.28%	52.31%
	Water Losses	Volume	6.625	5.021	6.723	7.313	6.834	7.871
		Percentage	45.24%	38.47%	45.71%	48.83%	43.60%	52.00%
	ILI		1.30	1.58	2.12	2.29	2.12	2.35
Buffeljags Bay	Treatment Losses	Volume	0.979	0.606	0.523	0.048	-0.139	-0.220
		Percentage	18.04%	13.37%	10.53%	0.98%	-2.77%	-3.89%
	NRW	Volume	0.705	0.200	0.373	0.770	0.930	3.156
		Percentage	15.85%	5.09%	8.40%	15.83%	18.03%	53.68%
	Water Losses	Volume	0.696	0.192	0.364	0.741	0.901	3.127
		Percentage	15.65%	4.89%	8.20%	15.24%	17.46%	53.19%
	ILI		3.83	1.06	2.0	4.05	4.95	33.80
TOTAL	**NRW**	**Volume**	**1 506.376**	**1 609.033**	**1 274.996**	**1 511.124**	**1 580.399**	**2 077.312**
		Percentage	**20.60%**	**21.29%**	**18.82%**	**21.54%**	**22.31%**	**28.26%**
	Water Losses	**Volume**	**1 491.753**	**1 593.920**	**1 261.447**	**1 418.983**	**1 521.865**	**1 997.106**
		Percentage	**20.40%**	**21.09%**	**18.62%**	**21.23%**	**21.48%**	**27.17%**
	ILI		1.74	2.03	1.57	1.73	1.83	2.32

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 Billed Metered Consumption figures up to 2019/2020 included the raw water volumes supplied from the different raw water pipelines to consumers, as well as the volume of treated effluent re-used by consumers. These volumes were excluded for the 2020/2021 financial year and therefore the drastic increase in the NRW and Water Losses for the 2020/2021 financial year, especially in the Greater Hermanus area.

The Infrastructure Leakage Index (ILI) in the above table is the most recent and preferred performance indicator for comparing leakage from one system to another. It is a non-dimensional index representing the ratio of the current real leakage and the "Unavoidable Annual Real Losses". A high ILI value indicates a poor performance with large potential for improvement while a small ILI value indicates a well-managed system with less scope for improvement. Attaining an ILI = 1 is a theoretical limit, which is the minimum water loss in an operational water reticulation system. A value of less than 1 should not occur since this implies that the actual leakage is less than the theoretical minimum level of leakage.

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

Table A.5.2: Reducing Unaccounted Water		
Reducing unaccounted water and water inefficiencies	**In Place**	**Assessment Score**
Night flow metering	Yes	80%
Day flow metering	Yes	80%
Reticulation leaks	Yes	80%
Illegal connections	Yes	80%
Un-metered connections	Yes	80%
Leak and meter repair programmes. Consumer units targeted by:		
Leak repair assistance programme	Yes	80%
Retro-fitting of water inefficient toilets	Yes	80%
Meter repair programme	Yes	80%
Consumer/end-use demand management: Public Information & Education Programmes		
Schools targeted by education programmes	Yes	80%
Consumers targeted by public information programmes	Yes	80%

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

Overstrand Municipality is committed to reducing the percentage of Water Losses for the various water distribution systems to below 20%. The Municipality's WDM Strategy and Action Plan include the following key activities (June 2021 progress in brackets):

- Continue with pipe replacement in priority areas with old reticulation networks and history of frequent pipe failures (2018/2019 to 2020/2021 phases included Rooi-Els, Pringle Bay, Betty's Bay, Kleinmond, Zwelihle, Northcliff and Voëlklip);
- Continued operation and maintenance of intelligent pressure management in Stanford, Kleinmond and Betty's Bay;
- Phased pro-active replacement of older water meters;
- Review and improve efficiency of remote monitoring of minimum night flows in all zones (On-going maintenance and extension of SCADA and telemetry systems).
- Link properties with distribution zones in financial data base to enable water balance in smaller areas (ongoing in all areas);
- Continue with leak repairs at indigent households and installation of water management devices;
- Enhance public awareness on general water and water demand management issues, e.g. the watering of gardens as determined by the bylaws, rain water harvesting, dam levels, and general water saving tips; regular publication of water and waste water quality in local media and on Overstrand Municipality's web-site; pamphlets are being issued with all building plan approvals, and primary school learners are reached with water awareness puppet shows and live shows;
- Identify users on financial data base with regular abnormal high or abnormal low water use, and physically inspect the causes (on-going);

- Sourcing of external funds, e.g. from the DWS WSIG program and MIG for water services projects;
- Tariffs structured to discourage excessive use of water, including volumetric sewerage tariffs, and specific water restriction tariffs implemented for specific water restriction levels (implemented and on-going);
- Continue with removal of alien vegetation in catchment areas (ongoing);
- Maximum use of treated effluent for irrigation (Implemented in Hermanus and Gansbaai; investigation for Hawston was done).

The Long-Term WC/WDM Strategy does not only refer to measures that reduce water wastage and inefficient use, but also include measures to effectively manage and sustain efficiency targets. Some of the priority requirements are to install systems that measure and identify certain key parameters such as minimum night flows and systems to enable detailed and regular water audits and water balances.

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 2020/2021.

Table A.5.3: System Input Volume, Average Billed Metered Consumption and NRW in Litre per Connection per Day for the various Water Distribution Systems for 2020/2021

Water Balance Component	Buffels River	Kleinmond	Greater Hermanus	Stanford	Greater Gansbaai	Pearly Beach	Baardskeerders-bos	Buffeljags Bay
System Input Volume	547	546	491	593	518	236	584	447
Average Billed Metered Cons.	272	350	374	437	395	165	279	207
Non-Revenue Water	275	196	117	156	124	70	306	240

Stanford is the town with the highest system input volume and average billed metered consumption per connection per day, while Baardskeerdersbos is the town with the highest NRW per connection per day.

DWS's scorecard for assessing the potential for WC/WDM efforts was completed for Overstrand 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. 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 zero 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 Overstrand Municipality is 87 out of 100 suggesting that the Municipality is making good progress with regard to the implementation of specific WC/WDM activities.**

TOPIC 6: WATER RESOURCES

The Western Cape experienced a severe drought over the period 2015 to 2019, with some relief during the 2020 to 2021 winter months. The drought over the period 2015 to 2019 reduced the safe yield of the Municipality's own existing surface and groundwater resources. The Municipality therefore continued with the implementation of various WC/WDM measures to lower the current and future water requirements and investigations of augmentation options for the existing water resources.

Below average rainfall was experienced in the Hermanus area during the period 2015 to 2019. Level 1 water restrictions were implemented in the Greater Hermanus area from 1 November 2017, and level 2 water restrictions from 1 June 2018, accompanied by the 1st level of restriction tariffs. Level 3 restrictions were implemented from 1 November 2019, but reduced to level 2 again from 1 February 2020, following a significant rainfall event in January 2020. Above average rainfall was experienced during the 2020 winter season, resulting in the water restrictions being lifted completely from 1 September 2020.

The municipality took a pro-active approach some years ago by firstly implementing a WC/WDM programme and secondly diversifying its water resources. The result was an actual reduction in the municipality's total annual bulk raw water demand by 13.2% from 2008/2009 to 2020/2021, despite a rapidly growing population.

The table below gives an overview of the current water resources, the current volumes abstracted and authorised and whether the abstractions are registered and recorded.

Table A.6.1: Current Water Sources and Volumes

Source Type	Source	Number of Sources	Current 20/21 Abstraction or Returns (Mm³/a)	Licensed Abstraction / Returns (Mm³/a)	Community Water Supply		Abstraction registered? (Yes/No)	Abstraction recorded? (Yes/No)
					Rural	Urban		
Groundwater	Baardskeerdersbos	2	0.018	0.060 (License)	NA	100%	Yes	Yes
	Buffeljags Bay	1	0.006	-	NA	100%	No	Yes
Surface Water	Buffels River dam	1	0.773	0.900 (WARMS)	NA	100%	Yes	Yes
	Franskraal and Kraaibosch dams	2	1.122	2.000 (WARMS)	NA	100%	Yes	Yes
	Klipgat fountain	1	0.269	-	NA	100%	No	Yes
	De Kelders fountain	1	0.136	-	NA	100%	No	Yes
	Pearly Beach and Koekemoer dams	1	0.153	0.257 (WARMS) 0.095 (Agreement)	NA	100%	Yes	Yes
External Sources (Bulk Purchase)	-	-	-	-	-	-	-	-
Water Returned to Source	Kleinmond WWTW	1	0.333	0.730 (GA)	-	-	-	-
	Hawston WWTW	1	0.203	0.365 (GA)	-	-	-	-
	Hermanus WWTW	1	1.937	4.380 (Permit)	-	-	-	-
	Stanford WWTW	1	0.239	0.730 (GA)	-	-	-	-
	Gansbaai WWTW	1	0.031	0.730 (GA)	-	-	-	-
	Pearly Beach WWTW	1	0.000	0.091 (GA)	-	-	-	-
Conjunctive use	Palmiet River	1	0.880	0.949 (WARMS)	NA	100%	Yes	Yes
	Dorpsfontein	1	-	0.110 (WARMS)	NA	100%	Yes	Yes
	Kleinmond Borehole	1	-		NA	100%	Yes	Yes
	Gateway Well Field	5	0.572	1.600 (License)	NA	100%	Yes	Yes
	Camphill and Volmoed Well Fields	7	0.841	1.200 (License)	NA	100%	Yes	Yes
	De Bos	1	2.786	2.800 (Court Ruling)	NA	100%	Yes	Yes
	Stanford Fountain	1	0.209	1.600 (License)	NA	100%	Yes	Yes
	Stanford Boreholes	2	0.237		NA	100%	Yes	Yes

The table below indicates the potential additional future water resources for Overstrand Municipality. These resources are with regard to the Greater Hermanus system.

Table A.6.2: Additional Water Sources and Volumes

Source Type	Schemes	Number of Sources	Potential Volume (Mm³/a)	Licensed Abstraction (Mm³/a)
Ground Water	Camphill and Volmoed boreholes, Third Phase	4	0.400	1.600
Surface Water	Desalination First Phase	1	1.095	Not yet done
	Desalination Second Phase	1	1.095	Not yet done
	Desalination Third Phase	1	1.460	Not yet done
External Sources (Bulk Purchase)	-	-	-	-

Overstrand Municipality has an established monitoring plan to monitor the volumes abstracted from all the various surface and ground water resources and quality of the water abstracted.

Table A.6.3: Monitoring of Abstraction Volumes, Water Levels and Water Quality

Monitoring of water abstracted	Assessment Score	
% of water abstracted monitored: Surface water	100%	
% of water abstracted monitored: Ground water	100%	
Monitoring of water levels and water quality	**Interval**	**Assessment Score**
Surface water levels (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Monthly	80%
Ground water levels (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Daily	80%
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)	Not Applicable	-
Borehole abstraction? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)	Daily	80%

Detail IWA Water Balances are available for each of the water distribution systems (towns) in Overstrand Municipality's Management Area. The graph below gives an overview of the average daily raw water supply to all the towns. The impact of the droughts experienced over the last number of years can be noted on the graphs.

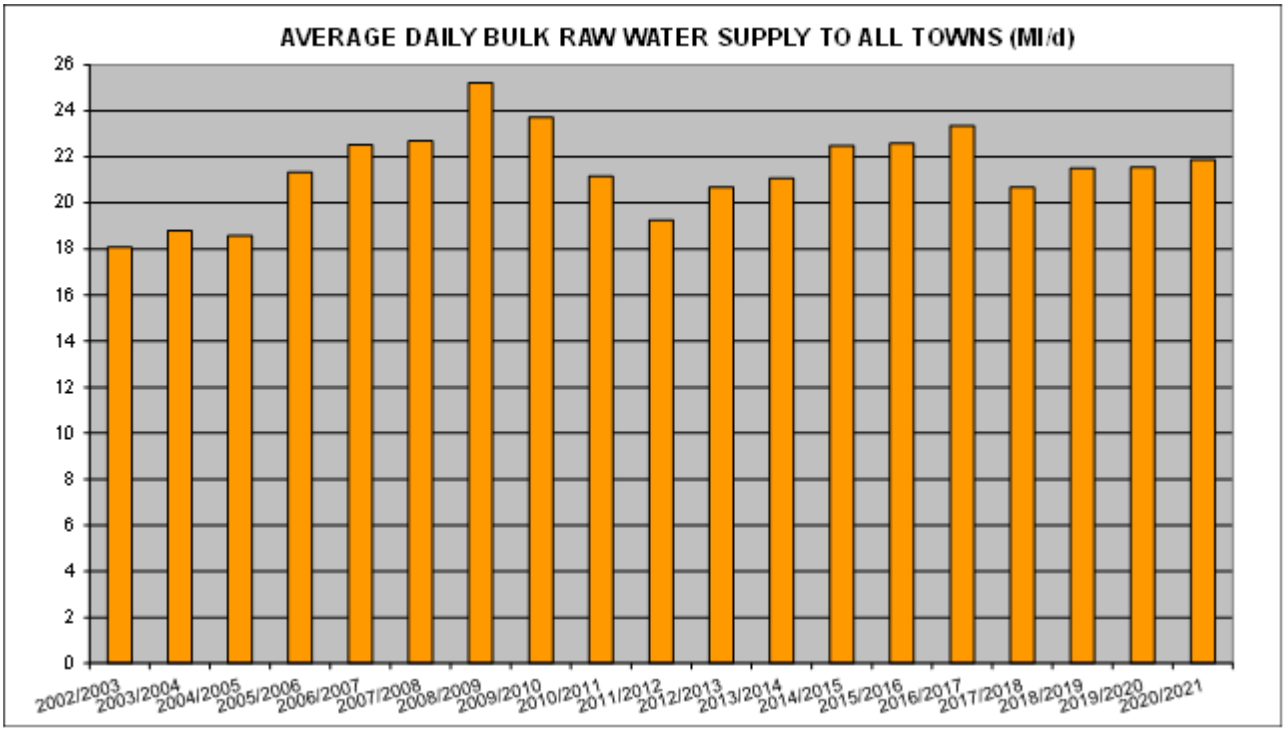


Figure A.6.1: Average Daily Bulk Raw Water Supply to all Towns

The graph below gives an overview of the system input volume and NRW for the various distribution systems in Overstrand Municipality's Management Area.

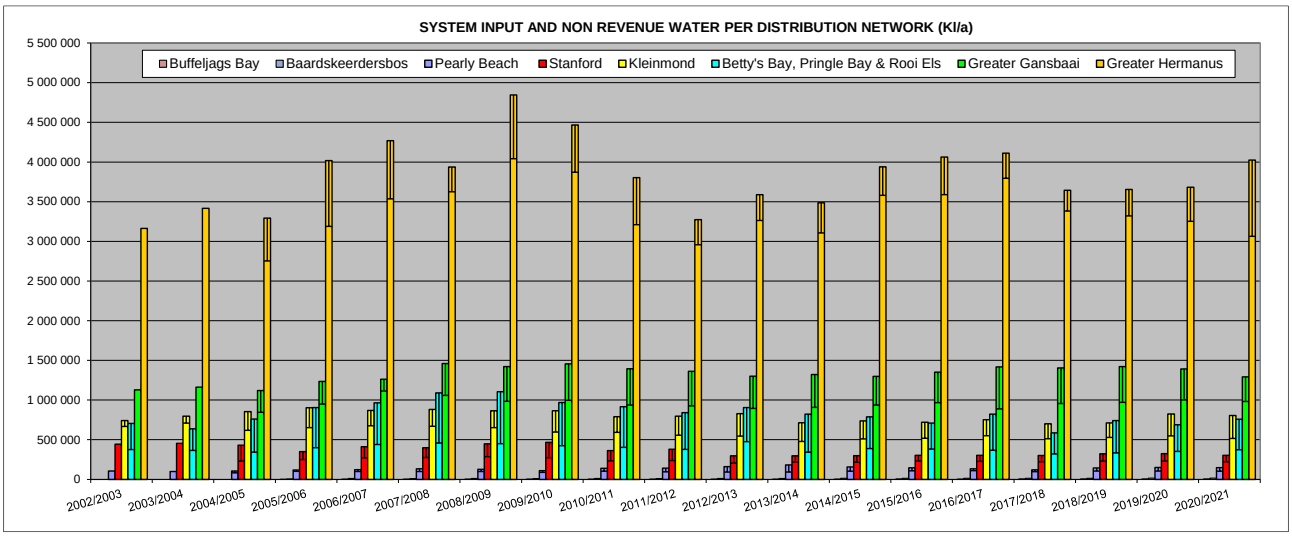


Figure A.6.2: System Input Volume and NRW per Distribution System

The table below gives a summary of the total bulk raw water supply to the various towns within Overstrand Municipality's Management Area.

Table A.6.4: Bulk Raw Water Supply to the Various Towns

Distribution System	Source	Record : Prior (Ml/a)					20/21
		15/16	16/17	17/18	18/19	19/20	
Buffels River	Buffels River Dam	762.669	882.833	649.669	801.120	767.993	772.751
Kleinmond	Palmiet River and Dorpsfontein spring	772.220	820.956	716.358	779.610	898.489	880.390
Greater Hermanus	De Bos Dam and Groundwater	4 636.164	4 765.620	4 182.703	4 141.553	4 128.705	4 242.199
Stanford	Stanford spring and two Boreholes	389.197	313.302	321.479	374.810	365.453	446.512
Greater Gansbaai	Kraaibosch and Franskraal Dam, Klipgat, De Kelders Grotte	1 511.060	1 579.802	1 529.544	1 559.727	1 524.604	1 467.816
Pearly Beach	Pearly Beach Springs and Koekemoer Dam	150.919	142.581	126.233	174.354	155.368	153.406
Baardskeerdersbos	Two Boreholes	18.380	16.019	17.154	18.077	18.311	17.741
Buffeljags Bay	One Borehole	5.427	4.533	4.966	4.912	5.019	5.879
Total Supply to all towns		**8 246.036**	**8 525.646**	**7 548.106**	**7 854.163**	**7 863.942**	**7 986.694**

Raw water is also supplied by Overstrand Municipality from their Fisherhaven dam and the Mossel River dams in Fernkloof to a number of users. The untreated raw water supply from the Fisherhaven dam is for the Karwyderskraal Landfill (Overberg District Municipality), Benguela Cove and a number of properties along the pipeline route for irrigation and non-potable use. The untreated raw water supply from the Mossel River dams is for the irrigation of the golf course and for the Fernkloof nature reserve. These dams are not part of the Municipality's water sources utilised for the treatment of the raw water to potable standards.

Water Quality: Overstrand Municipality makes use of an accredited external laboratory to conduct the drinking water compliance sampling and analysis. Samples are taken at various locations in each system and analysed to evaluate the compliance. The water quality results are loaded onto DWS's IRIS system via the internet. Once entered the data is automatically compared to the SANS241 Drinking Water Quality Standards. 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 Overstrand Municipality.

Table A.6.5: Water Quality

Water Quality	In place	Status Quo	Assessment Score
Reporting on quality of water taken from source: urban & rural	Yes	80%	80%
Quality of water returned to the resource: urban	Yes	80%	80%
Quality of water returned to the resource: rural	No	Not Applicable	80%
Is there a Pollution contingency measures plan in place?	Yes	80%	80%
Quality of water taken from source: urban - % monitored by WSA self?	Yes	80%	80%
Quality of water taken from source: rural - % monitored by WSA self?	No	Not Applicable	80%
Quality of water returned to the source: urban - % monitored by WSA self?	Yes	80%	80%
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%
% 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	Yes	40%	40%
The abstraction IS recorded	Yes	100%	100%
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 water quality of all the water distribution systems in Overstrand Municipality is "Excellent", according to the SANS 241:2015 classification. The overall percentage of compliance of the water quality samples taken over the period July to June for the last two financial years is summarised in the table below per distribution system. The additional monitoring required by Overstrand Municipality for determinands identified during the risk assessment exceeding the SANS 241:2015 numerical limits are also included in the table.

Table A.6.6: Percentage Compliance of the Water Quality Samples for the Last Two Financial Years

Performance Indicator	Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2015)		% Sample Compliance according to SANS 241-2015 Limits		Frequency of Additional Monitoring due to failure (Table 3 of SANS 241-2:2015)	
	20/21	19/20	20/21	19/20	20/21	19/20
Buffels River						
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	98.4%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	98.5%	99.0%	-	-
Operational Efficiency	No (Good)	Yes (Unacceptable)	92.7%	83.5%	-	Monthly
Kleinmond						
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	99.1%	94.7%	-	-
Greater Hermanus						
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	99.1%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	99.7%	-	-
Aesthetic	No (Excellent)	No (Excellent)	99.6%	98.5%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	98.5%	98.7%	-	-
Stanford						
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	98.9%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	100.0%	98.7%	-	-
Greater Gansbaai						
Acute Health Microbiological	No (Excellent)	Yes (Unacceptable)	99.6%	94.5%	-	Monthly
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	99.8%	99.0%	-	-
Operational Efficiency	No (Excellent)	Yes (Unacceptable)	97.9%	89.7%	-	Monthly
Pearly Beach						
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	99.2%	100.0%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	97.3%	100.0%	-	-
Baardskeerdersbos						
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	98.8%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	99.2%	-	-
Aesthetic	No (Excellent)	No (Excellent)	100.0%	93.2%	-	-
Operational Efficiency	No (Excellent)	No (Good)	98.1%	91.1%	-	-
Buffeljags Bay						
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	98.6%	-	-
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-

Table A.6.6: Percentage Compliance of the Water Quality Samples for the Last Two Financial Years						
Performance Indicator	**Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2015)**		**% Sample Compliance according to SANS 241-2015 Limits**		**Frequency of Additional Monitoring due to failure (Table 3 of SANS 241-2:2015)**	
	20/21	**19/20**	**20/21**	**19/20**	**20/21**	**19/20**
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	Yes (Unacceptable)	97.4%	82.9%	-	Quarterly
Operational Efficiency	No (Excellent)	No (Excellent)	96.2%	97.3%	-	-

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

Table A.6.7: Four Categories under which the Risks Posed by Micro-organism, Physical or Aesthetic Property or Chemical Substance of Potable Water is Normally Classified	
Category	**Risk**
Acute Health	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 Overstrand Municipality, in terms of the minimum requirements of SANS:241-2: 2015 (Table 2). The period assessed was for samples taken from July 2020 to June 2021.

Table A.6.8: Overstrand Municipality's Compliance of the Monthly E.Coli Monitoring Frequency in the Water Distribution Systems in Terms of the Minimum Requirements of SANS 241-2:2015 (Table 2).			
Distribution System	**Population served**	**Required number of monthly samples (SANS 241-2:2015: Table 2)**	**Average Number of monthly E.Coli samples taken by Municipality during 2020/2021**
Buffels River	3 312	2.0	9.9
Kleinmond	8 279	2.0	6.0
Greater Hermanus	70 038	14.0	17.3
Stanford	6 050	2.0	6.2
Greater Gansbaai	20 479	4.1	18.1
Pearly Beach	1 263	2.0	6.0
Baardskeerdersbos	128	2.0	6.0
Buffeljags Bay	154	2.0	4.3

It can be noted from the above table that the number of monthly E.Coli samples taken by the Municipality during the 2020/2021 financial year was far more than the required number of samples for all the water distribution systems.

Effluent quality: The effluent quality compliance sample results are loaded onto DWS's IRIS via the internet. The final effluent quality complies with the authorised Microbiological, Chemical and Physical limits for most of the WWTWs The overall Microbiological, Chemical and Physical compliance percentages of the final effluent samples taken over the last three financial years at the Kleinmond-, Hawston-, Hermanus-, Stanford-, Gansbaai and Pearly Beach WWTW are summarised in the tables below.

Table A.6.9: Percentage Microbiological (Faecal Coliforms) Compliance of the Compliance Samples Taken at the Various WWTWs for the Last Three Financial Years			
WWTW	**2018/2019**	**2019/2020**	**2020/2021**
Kleinmond	83.3%	100.0%	100.0%
Hawston	100.0%	100.0%	100.0%
Hermanus	100.0%	100.0%	100.0%
Stanford	91.7%	91.7%	100.0%
Gansbaai	100.0%	91.7%	100.0%

Table A.6.9: Percentage Microbiological (Faecal Coliforms) Compliance of the Compliance Samples Taken at the Various WWTWs for the Last Three Financial Years			
WWTW	**2018/2019**	**2019/2020**	**2020/2021**
Pearly Beach	-	81.8%	100.0%
Total	**95.0%**	**95.7%**	**100.0%**

Note: Where parameters were resampled, due to failures, the resampled results were used to calculate the above compliance percentages.

Table A.6.10: Percentage Chemical Compliance of the Compliance Samples Taken at the Various WWTWs for the Last Three Financial Years

WWTW	2018/2019					2019/2020					2020/2021				
	Ammonia	Nitrites & Nitrates	COD	Ortho Phosphate	Overall	Ammonia	Nitrites & Nitrates	COD	Ortho Phosphate	Overall	Ammonia	Nitrites & Nitrates	COD	Ortho Phosphate	Overall
Kleinmond	50.0%	100.0%	91.7%	100.0%	85.4%	25.0%	100.0%	66.7%	100.0%	72.9%	8.3%	100.0%	66.7%	100.0%	**68.8%**
Hawston	83.3%	100.0%	100.0%	100.0%	95.8%	83.3%	100.0%	91.7%	100.0%	93.8%	83.3%	100.0%	75.0%	100.0%	**89.6%**
Hermanus	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	**100.0%**
Stanford	91.7%	100.0%	100.0%	100.0%	97.9%	83.3%	100.0%	83.3%	83.3%	87.5%	91.7%	100.0%	91.7%	100.0%	**95.8%**
Gansbaai	100.0%	91.7%	100.0%	100.0%	97.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	91.7%	100.0%	100.0%	**97.9%**
Pearly Beach	-	-	-	-	-	90.9%	100.0%	0.0%	100.0%	72.7%	58.3%	100.0%	0.0%	83.3%	**60.4%**
Total	**85.0%**	**98.3%**	**98.3%**	**100.0%**	**95.4%**	**80.3%**	**100.0%**	**74.6%**	**97.2%**	**88.0%**	**73.6%**	**98.6%**	**72.2%**	**97.2%**	**85.4%**

Note: Where parameters were resampled, due to failures, the resampled results were used to calculate the above compliance percentages

Table A.6.11: Percentage Physical Compliance of the Compliance Samples Taken at the Various WWTWs for the Last Three Financial Years.

WWTW	2018/2019				2019/2020				2020/2021			
	pH	Electrical Conductivity	Total Suspended Solids	Overall	pH	Electrical Conductivity	Total Suspended Solids	Overall	pH	Electrical Conductivity	Total Suspended Solids	Overall
Kleinmond	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	58.3%	86.1%	100.0%	91.7%	83.3%	**91.7%**
Hawston	100.0%	50.0%	100.0%	83.3%	100.0%	25.0%	83.3%	69.4%	100.0%	16.7%	100.0%	**72.2%**
Hermanus	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	**100.0%**
Stanford	100.0%	100.0%	100.0%	100.0%	100.0%	83.3%	75.0%	86.1%	100.0%	66.7%	100.0%	**88.9%**
Gansbaai	100.0%	83.3%	100.0%	94.4%	100.0%	58.3%	100.0%	86.1%	100.0%	83.3%	100.0%	**94.4%**
Pearly Beach	-	-	-	-	63.6%	0.0%	18.2%	27.3%	75.0%	0.0%	25.0%	**33.3%**
Total	**100.0%**	**86.7%**	**100.0%**	**95.6%**	**95.2%**	**62.0%**	**73.2%**	**76.5%**	**95.8%**	**59.7%**	**84.7%**	**80.1%**

Note: Where parameters were resampled, due to failures, the resampled results were used to calculate the above compliance percentages

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

Table A.6.12: Trend of Microbiological, Chemical and Physical Compliance Percentages for the various WWTWs.

WWTW	2014/2015 to 2016/2017			2016/2017 to 2018/2019			2018/2019 to 2020/2021		
	Micro.	Chemical	Physical	Micro.	Chemical	Physical	Micro.	Chemical	Physical
Kleinmond	Same	Increase	Increase	Decrease	Decrease	Same	Increase	Decrease	Decrease
Hawston	Same	Increase	Decrease	Same	Increase	Increase	Same	Decrease	Decrease
Hermanus	Increase	Same	Increase	Increase	Same	Same	Same	Same	Same
Stanford	Same	Decrease	Same	Same	Increase	Increase	Increase	Decrease	Decrease
Gansbaai	Decrease	Increase	Increase	Increase	Increase	Decrease	Same	Same	Same

Industrial Consumers: The Municipality is currently busy with the updating of their Water Supply and Sanitation Services By-law. The updating include the reviewing of the charges that need to be paid by the industrial consumers for the quality of final effluent discharged into the municipality's sewer system by them. The Municipality regularly liaise with industrial consumers with regard to the quality of final effluent discharged by them. Industrial effluent quality sample results are received by the Municipality from e.g. the abalone farm and the wine cellars that discharge effluent in the Municipality's sewer system.

TOPIC 7: FINANCIAL

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

Table A.7.1: Historical Capital Expenditure of the Water and Sewerage Infrastructure Budgets

Financial Year	Water Infrastructure			Sewerage Infrastructure		
	Budget	Expenditure	% Spend	Budget	Expenditure	% Spend
2011/2012	R71 859 060	R57 332 947	79.79%	R29 101 193	R26 040 258	89.48%
2012/2013	R56 878 743	R48 633 690	85.50%	R17 877 374	R16 342 067	91.41%
2013/2014	R23 831 730	R23 630 683	99.16%	R12 153 413	R10 159 365	83.59%
2014/2015	R16 384 323	R16 275 016	99.33%	R12 070 996	R11 969 551	99.16%
2015/2016	R16 390 184	R14 232 323	86.83%	R8 360 500	R6 418 821	76.78%
2016/2017	R15 588 846	R15 772 309	101.18%	R14 848 519	R14 821 358	99.82%
2017/2018	R1 447 495	R1 432 532	98.97%	R12 252 782	R8 294 387	67.69%
2018/2019	R21 945 225	R12 270 442	55.91%	R44 868 863	R34 962 591	77.92%
2019/2020	R39 982 374	R24 903 681	62.29%	R20 240 106	R15 641 239	77.28%
2020/2021	R50 035 705	R34 573 765	69.10%	R41 458 465	R30 513 335	73.60%

Operational Budget: The actual operational and maintenance expenditure and income for the last five financial years for water and sanitation services is summarised in the table below.

Table A.7.2: Summary of Operational and Maintenance Expenditure and Income for Water and Sanitation Services

Service	Expenditure / Income	16/17	17/18	18/19	19/20	20/21
Water	Expenditure	R103 668 319	R115 139 624	R117 615 148	R128 656 376	R137 409 799
	Income	R121 632 410	R123 749 823	R145 980 226	R153 663 169	R153 115 215
	Surplus / (Deficit)	**R17 964 091**	**R8 610 199**	**R28 365 078**	**R25 006 793**	**R15 705 416**
Sanitation	Expenditure	R67 828 647	R79 310 459	R86 438 364	R94 725 991	R99 329 089
	Income	R82 291 448	R83 627 554	R104 583 319	R98 447 712	R109 567 538
	Surplus / (Deficit)	**R14 462 801**	**R4 317 095**	**R18 144 955**	**R3 721 721**	**R10 238 449**

Tariff and Charges: The first six (6) kl of water is provided free to all indigent registered households. Overstrand Municipality's tariffs support the viability and sustainability of water supply services to the poor through cross-subsidies (where feasible). Free basic water and sanitation services are linked to the Municipality's Indigent Policy and all indigent registered households therefore receive free basic water and sanitation services. This implies that either the equitable share is used to cover this cost, or higher consumption blocks are charged at a rate greater than the cost in order to generate a surplus to cross-subsidise consumers who use up to six (6) kilolitres per month.

Tariffs often comprise both a fixed charge and a variable charge based on consumption. The cost consumers had to pay for their water services in Overstrand Municipality's Management Area, for the various financial years, is presented on the graph below (Normal residential water tariffs).

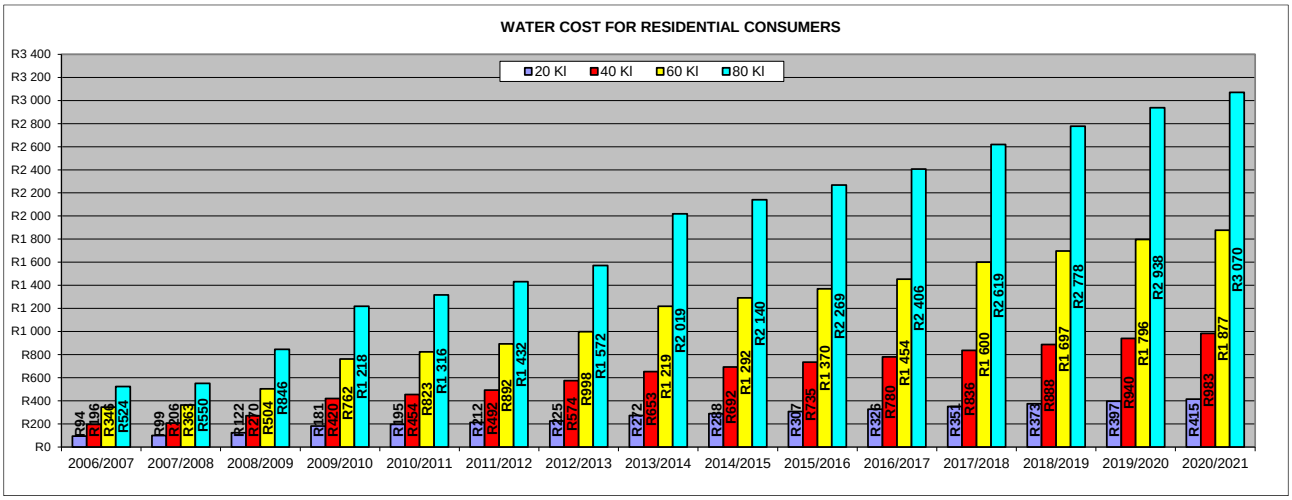


Figure A.7.1: Water Cost for Residential Consumers

The water tariff structures for Overstrand Municipality for the 2020/2021 financial year and the previous four financial years are summarised in the table below (Subject to VAT).

Table A.7.3: Water Tariffs

Consumer / Description	Tariff Code	Category		16/17	17/18	18/19	19/20	20/21
Consumer Deposits	WD1	Domestic Water		R500-00	R530-00	R562-00	R594-03	R620-76
	WD2	Commercial Water Cons. < 40 kl		R2 000-00	R2 120-00	R2 248-00	R2 376-14	R2 483-07
	WD3	Commercial Water Cons 40 – 100 kl		R7 000-00	R7 420-00	R7 866-00	R8 314-36	R8 688-51
	WD4	Commercial Water Cons. 100 kl +		R12 000-00	R12 720-00	R13 484-00	R14 252-59	R14 893-96
	WD5	Domestic – Water RUEs		Applicable RUE's x WD1A				
	WD6	Indigent Registered		R160-00	R169-60	R180-00	R190-26	R198-82
Basic Charge	W1A1	Basic Monthly Charge per erf/unit per month		R114-04	R121-83	R129-14	R136-50	R142-64
	W1A2A	Basic Monthly Charge: Residential Indigent as per paragraph A of the Indigent Policy erf/unit per month		-	-	-	R136-50	R142-64
	W1A2B	Basic Monthly Charge: Residential Indigent as per paragraph B, C & D of the Indigent Policy erf/unit per month		-	-	-	R129-14	R129-14
	W1A3A	Fixed Infrastructure Basic Charge per erf/unit per month		R15-45	R15-45	R15-45	R15-45	R15-45
	W1A3B	Fixed Infrastructure Basic Charge per erf/unit per month		-	-	R8-41	R8-41	R8-41
	W1A3C	Subsidised Fixed Infrastructure Basic Charge per erf/unit per month – Registered Indigent Households		-	-	-	R8-41	R8-41
Consumption Households and Registered Indigent Households (0 - 6 kl subsidised for indigent households)	W1B1	Normal Tariff & Level 1 restrictions	0 – 6 kl per kl	R4-04	R4-50	R5-02	R5-60	R5-85
	W1B2		7 - 18 kl per kl	R9-66	R10-24	R10-85	R11-47	R11-99
	W1B3		19 – 30 kl per kl	R15-67	R16-61	R17-61	R18-61	R19-45
	W1B4		31 – 45 kl per kl	R24-13	R25-57	R27-11	R28-66	R29-95
	W1B5		46 - 60 kl per kl	R31-35	R33-22	R35-21	R37-22	R38-89
	W1B6		> 60 kl per kl	R41-79	R44-30	R46-96	R49-64	R51-87
	W1B7		0 – 6 kl per kl	R4-04	R4-50	R5-02	R5-60	R5-85
	W1B8		7 – 18 kl per kl	R12-56	R13-31	R14-11	R14-91	R15-58

Table A.7.3: Water Tariffs								
Consumer / Description	**Tariff Code**	**Category**		**16/17**	**17/18**	**18/19**	**19/20**	**20/21**
	W1B9	Restriction Tariff 1 (level 2 & 3 restrictions)	19 - 30 kl per kl	R20-38	R21-59	R22-89	R24-19	R25-28
	W1B10		31 - 45 kl per kl	R31-37	R33-25	R35-24	R37-25	R38-93
	W1B11		46 - 60 kl per kl	R40-75	R43-19	R48-37	R51-13	R53-43
	W1B12		> 60 kl	R54-33	R57-59	R64-50	R68-18	R71-25
	W1B13	Restriction Tariff 2 (level 4 & 5 restrictions)	0 – 6 kl per kl	R4-04	R4-50	R5-02	R5-60	R5-85
	W1B14		7 – 18 kl per	R15-46	R16-39	R17-38	R18-37	R19-20
	W1B15		19 - 30 kl per kl	R25-08	R26-58	R28-18	R29-79	R31-13
	W1B16		31 - 45 kl per kl	R38-61	R40-92	R43-38	R45-85	R47-91
	W1B17		46 - 60 kl per kl	R50-16	R53-17	R59-55	R62-94	R65-77
	W1B18		> 60 kl	R66-87	R70-88	R79-38	R83-90	R87-68
	W1B19	Restriction Tariff 3 (level 6 restrictions)	0 – 6 kl per kl	R4-04	R4-50	R5-02	R5-60	R5-85
	W1B20		7 – 18 kl per kl	R19-33	R20-48	R22-94	R24-25	R25-34
	W1B21		> 18 kl per kl	R83-58	R88-59	R99-23	R104-89	R109-61
Consumption – All other	W1C1	Normal Tariff & Level 1 restrictions	0 – 18 kl per kl	R10-69	R11-33	R12-01	R12-69	R13-26
	W1C2		19 -30 kl per kl	R15-67	R16-61	R17-61	R18-61	R19-45
	W1C3		31 – 45 kl per kl	R24-13	R25-57	R27-11	R28-66	R29-95
	W1C4		46 – 60 kl per kl	R31-35	R33-22	R35-21	R37-22	R38-89
	W1C5		> 60 kl per kl	R41-79	R44-30	R46-96	R49-64	R51-87
	W1C6	Restriction Tariff 1 (level 2 & 3 restrictions)	0 – 18 kl per kl	R13-90	R14-73	R15-61	R16-50	R17-24
	W1C7		19 – 30 kl per kl	R20-38	R21-59	R22-89	R24-19	R25-28
	W1C8		31 - 45 kl per kl	R31-37	R33-25	R35-24	R37-25	R38-93
	W1C9		46 - 60 kl per kl	R40-75	R43-20	R48-38	R51-14	R53-44
	W1C10		> 60 kl	R54-33	R57-58	R64-49	R68-17	R71-24
	W1C11	Restriction Tariff 2 (level 4 & 5 restrictions)	0 – 18 kl per kl	R17-11	R18-13	R19-22	R20-32	R21-23
	W1C12		19 - 30 kl per kl	R25-08	R26-58	R28-18	R29-79	R31-13
	W1C13		31 - 45 kl per kl	R38-61	R40-92	R43-38	R45-85	R47-91
	W1C14		46 - 60 kl per kl	R50-16	R53-17	R59-55	R62-94	R65-77
	W1C15		> 60 kl	R66-87	R70-88	R79-38	R83-90	R87-68
	W1C16	Restriction Tariff 3 (level 6 restrictions)	0 – 10 kl per kl	R21-38	R22-66	R24-02	R25-39	R26-53
	W1C17		> 10 kl per kl	R83-58	R88-59	R99-23	R104-89	R109-61
Other Consumers	W1D1	Departmental per kl		R18-42	R18-42	R21-63	R23-39	R24-86
	W1D2	Fire Hoses: Basic per month		R145-61	R155-04	R164-34	R173-71	R181-53
	W1D3	Bulk usage (Unconnected to networks) per kl		R11-75	R12-54	R13-29	R14-05	R14-68
	W1D3A	Restriction Tariff 1 (level 2 & 3 water restrictions)		-	-	-	R18-27	R19-09
	W1D3B	Restriction Tariff 2 (level 4 & 5 water restrictions)		-	-	-	R22-28	R23-28
	W1D3C	Restriction Tariff 3 (level 6 water restrictions)		-	-	-	R28-10	R29-39
	W1D4	Kidbrooke (Van Cauter 0 – 8000 kl /a)		R0-08	R0-08	R0-08	R0-08	R0-08
	W1D5	Onrus Small Holdings Tariff 2 (Van Cauter)		R0-08	R0-08	R0-08	R0-08	R0-08
	W1D6	Onrus Small Holdings Tariff 4 (Per Agreement)		R1-05	R1-05	R1-05	R1-11	R1-11
	W1D7	Contractors water consumption – temporary connection		R18-42	R18-42	R21-63	R23-39	R24-86
	W1D8	Bulk usage (Unconnected to networks) per Kl - People residing outside the Overstrand municipal area		-	-	R49-30	R52-11	R54-45
	W1D8A	Restriction Tariff 1 (level 2 & 3 restrictions)		-	-	R64-09	R67-74	R70-79
	W1D8B	Restriction Tariff 2 (level 4 & 5 restrictions)		-	-	R78-88	R83-38	R87-13
	W1D8C	Restriction Tariff 3 (level 6 restrictions)		-	-	R98-60	R104-22	R108-91
	W1E1		0 – 500 kl per kl	R15-53	R16-48	R17-47	R18-47	R19-30

Table A.7.3: Water Tariffs								
Consumer / Description	**Tariff Code**	**Category**		**16/17**	**17/18**	**18/19**	**19/20**	**20/21**
Wet Commercial, Sport, Parks etc. (must apply for this tariff)	W1E2	Normal Tariff & Level 1 restrictions	501 – 1 000 kl per kl	R23-51	R24-92	R26-41	R27-92	R29-18
	W1E3		> 1 000 kl per kl	R31-35	R33-23	R35-22	R37-23	R38-91
	W1E4	Restriction Tariff 1 (level 2 & 3 restrictions)	0 – 300 kl per kl	R20-19	R21-44	R22-72	R24-02	R25-10
	W1E5		301 – 700 kl per kl	R30-56	R32-39	R34-33	R36-29	R37-92
	W1E6		> 700 kl per kl	R40-75	R43-20	R45-79	R48-40	R50-58
	W1E7	Restriction Tariff 2 (level 4 & 5 restrictions)	0 – 250 kl per kl	R24-85	R26-38	R27-96	R29-55	R30-88
	W1E8		251 – 500 kl per kl	R37-61	R39-87	R42-26	R44-67	R46-68
	W1E9		> 500 kl per kl	R50-16	R53-16	R56-35	R59-56	R62-24
	W1E10	Restriction Tariff 3 (level 6 restrictions)	0 – 100 kl per kl	R31-06	R32-97	R34-95	R36-94	R38-60
	W1E11		>100 kl per kl	R62-70	R66-46	R70-44	R74-46	R77-81
Wet Industry (Marine etc, must apply for this tariff) (Average of 100kl per day over prev. 365 days)	W1F1	Normal Tariff & Level 1 restrictions	1 – 5 800 kl per kl	R16-20	R17-17	R18-20	R19-24	R20-11
	W1F2		> 5 800 kl per kl	R31-35	R33-23	R35-22	R37-23	R38-91
	W1F3	Restriction Tariff 1 (level 2 & 3 restrictions)	1 – 5 800 kl per kl	R21-06	R22-32	R23-66	R25-01	R26-14
	W1F4		> 5 800 kl per kl	R40-75	R43-20	R45-79	R48-40	R50-58
	W1F5	Restriction Tariff 2 (level 4 & 5 restrictions)	1 – 5 800 kl per kl	R25-92	R27-48	R29-12	R30-78	R32-17
	W1F6		> 5 800 kl per kl	R50-16	R53-16	R56-35	R59-56	R62-24
	W1F7	Restriction Tariff 3 (level 6 restrictions	1 – 5 800 kl per kl	R32-40	R34-34	R36-40	R38-47	R40-20
	W1F8		> 5 800 kl per kl	R62-70	R66-46	R70-44	R74-46	R77-81
Availability Charges	W2A1	Overstrand per month		R114-04	R121-83	R129-14	R136-50	R142-64
	W2A2	Farms connected to water pipeline		R114-04	R121-83	R129-14	R136-50	R142-64
Rebates (Granted by Municipal Manager after application)	W2J1	Kl above average – per kl		R18-42	R18-42	R21-63	R23-39	R24-86
Irrigation Water (Leiwater) & Raw Water	W3A1	Use and pump water (80-90min) per month Stanford		R35-09	R37-20	R39-47	R41-72	R43-60
	W3A2	Pearly Beach Small Holdings: Basic		R42-98	R45-39	R48-16	R50-91	R53-20
	W3A3	Pearly Beach Small Holdings: Consumption 0 – 70 kl per kl		R3-35	R3-55	R3-77	R3-98	R4-16
	W3A4	Pearly Beach Small Holdings: Consumption > 70 kl per kl		R7-81	R8-30	R8-82	R9-32	R9-74
	W3A5	Others		R3-35	R3-55	R3-77	R3-98	R4-16
	W3A6	Farm 1/722 Stanford as per agreement 1.75% of raw water abstraction from municipal boreholes, max 8760 kl/a		R0-00	R0-00	R0-00	R0-00	R0-00
	W3A7	Farm 586 Volmoed raw water from De Bos pipeline consumption 0-300 kl/month per kl		R0-00	R0-00	R0-00	R0-00	R0-00
	W3A8	Farm 586 Volmoed raw water from De Bos pipeline consumption >300 kl/month per kl		R3-33	R3-55	R3-55	R3-75	R3-92
Irrigation Water (Treated Effluent)	W3B2	Hermanus Golf Club per month		R37 954-39	R40 422-01	R42 847-33	R45 289-63	R47 325-57
	W3B3	All other per kl		R2-19	R2-27	R2-41	R2-55	R2-66
	W3B4	Schools, municipal sports grounds & project sport grounds as per agreement		No Charge	No Charge	No Charge	No Charge	No Charge
	W3B5	Curro Holdings – 250kl free per day as per deed of sale		R2-19	R2-27	R2-41	R2-55	R2-66
Sundry Charges	W4A1	Testing of a meter (Call-out fee incl.)		R767-54	R813-59	R862-61	R912-17	R953-04

Table A.7.3: Water Tariffs							
Consumer / Description	**Tariff Code**	**Category**	**16/17**	**17/18**	**18/19**	**19/20**	**20/21**
	W4A2	Testing of a meter (Ind. / Bulk Meter)	Cost + 15% Min charge of R500-00	Cost + 15% Min charge of R500-00	Cost + 15% Min charge of R500-00	Cost + 15% Min charge of R500-00	Cost + 15% Min charge of R500-00
	W4A3	Disconnection	R348-25	R369-14	R391-30	R413-91	R432-17
	W4A4	Reconnection	R348-25	R369-14	R391-30	R413-91	R432-17
	W4A5	Reconnection after normal working hrs	R695-61	R737-35	R782-61	R826-96	R864-35
	W4A6	Administration fee – recalculation due to no meter access	R135-97	R144-12	R153-04	R161-74	R168-70
	W4A7	Verification of a meter reading	R190-35	R201-77	R213-91	R226-09	R236-52
	W4A8	Final and special readings	R173-68	R184-10	R195-65	R206-96	R216-52
	W4A9	Call-out fee – Normal working hrs	R347-37	R368-21	R390-44	R413-04	R431-30
	W4A10	Call-out fee – After hrs	R695-61	R737-35	R781-74	R826-09	R863-48
	W4A11	Replacement of damage meter	-	R990-00	R1 049-57	R1 109-57	R1 159-13
	W4A12	Removal of Meter (based on call out fee)	-	-	R862-61	R912-17	R953-04
	W4A13	Registration of Borehole	R260-53	R276-16	R293-04	R309-57	R323-48
	W4A14	Repositioning of Meter (Excl. pipe)	R764-04	R809-88	R859-13	R907-83	R948-70
	W4A15	Convert to water flow restrictor meter	R2 489-47	R2 638-84	R2 797-39	R2 956-52	R3 089-57
	W4A16	Temporary connections – deposit	R6 551-00	R6 944-06	R7 360-00	R7 780-00	R8 130-00
	W4A17	Temporary connection – usage per kl	R12-28	R13-02	R18-96	R23-39	R24-35
	W4A18	Damage to Water Meter	Actual cost plus 15%	Actual cost plus 15%	Actual cost plus 15%	Actual cost plus 15%	Actual cost plus 15%
	W4A19	Damage of Watermain	Actual cost plus R2 633-00	Actual cost plus R2 790-98	Actual cost plus R2 958-44	Actual cost plus R3 127-07	Actual cost plus R3 268-00
	W4A20	Damage of Service Connection (including water meter)	Actual cost plus R658-00	Actual cost plus R697-48	Actual cost plus R777-69	Actual cost plus R822-02	Actual cost plus R859-00
Illegal Connection / Tampering Fee	W5A1	1st Offence	R5 810-00	R6 158-60	R6 529-00	R6 901-00	R7 212-00
	W5A2	2nd Offence – Must convert to a flow-restriction water meter at applicable tariff	Restricted Access	R7 227-08	R7 661-00	R8 098-00	R8 462-00
	W5A3	3rd Offence (Restriction of service and remedial action fee = double previous offence fee)	-	Previous offence amount x 2	Previous offence amount x 2	Previous offence amount x 2	Previous offence amount x 2
Connection Fee	W6A1	20mm Connection Conventional Meter	R4 256-14	R4 511-51	R4 782-61	R5 055-65	R5 283-48
	W6A2	20 mm Connection Water Flow Restrictor Meter	R5 054-39	R5 357-65	R5 680-00	R6 003-48	R6 273-91
	W6A3	Other Connections	Actual Cost + 15%	Actual Cost + 15%	Actual Cost + 15%	Actual Cost + 15%	Actual cost plus + 15%
	W6A4	Connections (Erf Boundary – by Dev.)	R1 106-14	R1 172-51	R1 243-48	R1 314-78	R1 373-91
Bulk Service Dev. Fees	W7	Tariffs set out in Development Contribution Tariff list	Development Contributions will be determined as set out in the Annexure in respect of Dev. Contribution Policy				

The sewerage tariff structures for Overstrand Municipality for the 2020/2021 financial year and the previous four financial years are summarised in the table below (Subject to VAT).

Table A.7.4: Sewerage Tariffs							
Consumer / Description	**Tariff Code**	**Category**	**16/17**	**17/18**	**18/19**	**19/20**	**20/21**
Sewerage – Single and Intermediate Residential (Dwelling house and duplex flats, Conventional sewers, small bore sewers and	SE7A1	0 – 35 kl per kl (based on 70% of 50 kl water usage) – per unit per month. Conservancy tank service only during office hours per month. For after-hours service, refer to tariff SE9B.	R11-54	R12-22	R12-96	R12-22	R14-32
	SE7A2	Where no municipal water is used – per RUE per month. Conservancy tank service only during office hours	-	-	-	-	R128-83

Table A.7.4: Sewerage Tariffs								
Consumer / Description	**Tariff Code**	**Category**		**16/17**	**17/18**	**18/19**	**19/20**	**20/21**
conservancy tanks)		per month. For after-hours service, refer to tariff SE9B.						
Sewerage – registered indigent households	SE7A4	0 – 4.2 kl – subsidised		R11-54	R12-22	R12-96	R12-22	R14-32
	SE7A5	4.3 – 35 kl per kl (based on 70% of 50 kl water usage) – per unit per month, Conservancy tank service only during office hours per month. For after-hours service, refer to tariff SE9B.		R11-54	R12-22	R12-96	R12-22	R14-32
Sewerage – General residential (Blocks of flats and residential buildings)	SE7B1	0 – 45kl per kl (based on 90% of 50 kl water usage) per unit per month.		R11-54	R12-22	R12-96	R12-22	R14-32
Sewerage – Guest house, bed & breakfast establishments	SE7C1	Per kl (based on 70% of water usage) per unit per month		R11-54	R12-22	R12-96	R12-22	R14-32
Consumption – All other (Including Commercial, Industrial, School, Sport, etc.)	SE7D1	Per kl (based on 90% of water usage) per unit per month – this percentage may be adjusted according to the Tariff Policy after investigation		R11-54	R12-22	R12-96	R12-22	R14-32
Consumption - Departmental	SE7E1	0 – 35 kl per kl (based on 70% of 50 kl water usage) per unit per month.		R11-54	R12-22	R12-96	R12-22	R14-32
Basic Charge	SE8A	Basic Monthly Charge Developed sites per erf/unit per month.		R102-63	R108-54	R115-09	R108-54	R127-12
	SE8A1	Basic Monthly Charge: Residential Indigent as per paragraph A of the Indigent Policy per month		-	-	-	R121-65	R127-12
	SE8A2	Basic Monthly Charge: Residential Indigent as per paragraph B, C & D of the Indigent Policy per month		-	-	-	R115-09	R115-09
	SE8B	Basic Monthly Charge Undeveloped sites – cannot connect to the network per erf/unit per month.		R69-30	R73-13	R77-54	R73-13	R85-65
	SE8C	Basic Monthly Charge Undeveloped sites – can connect to the network per erf/unit per month		R122-81	R108-54	R115-09	R108-54	R127-12
	SE8D	Basic Monthly Charge Developed sites – with a septic Tank per erf/unit per month		R69-30	R73-13	R77-54	R73-13	R85-65
	SE8E	Basic Monthly Charge – Low Cost Housing & Single Quarters per erf/unit per month		R69-30	R73-13	R77-54	R73-13	R85-65
	SE8F1	Fixed Infrastructure Basic Charge per erf/unit per month		R9-60	R9-60	R9-60	R9-60	R9-60
	SE8F2	Fixed Infrastructure Basic Charge per erf/unit per month		-	-	R3-43	R3-43	R3-43
	SE8F3	Subsidised Fixed Infrastructure Basic Charge per erf/unit per month – Registered Indigent		-	-	-	R3-43	R3-43
Other Sewerage Charges and Sundry Charges	SE9A1	Vacuum Tanker Service for users not paying tariffs SE7 above – Provided on request	Vacuum Tanker service provided on request <6kl (per 6kl or part thereof)	R471-05	R499-40	R529-39	R559-57	R584-75
	SE9A2		Vacuum Tanker service provided on request <5kl (per 5kl or part thereof)	R471-05	R499-40	R529-39	R559-57	R584-75
	SE9A4		Vacuum Tanker service provided on request >6kl (per 6kl or part thereof)	R471-05	R499-40	R529-39	R559-57	R584-75
	SE9A5		Call out fee for Tank Service request but no	R471-05	R499-40	R529-39	R559-57	R584-75

Table A.7.4: Sewerage Tariffs								
Consumer / Description	**Tariff Code**	**Category**		**16/17**	**17/18**	**18/19**	**19/20**	**20/21**
			service due to another defect					
	SE9A6		More than 3 pipes an additional fee per pipe for users not paying tariff SE7 above	R69-30	R73-13	R77-54	R81-96	R85-65
	SE9B1	After Hours Vacuum Tanker Service – Provided on request	After hours per request < 6kl (per 6kl or part thereof)	R942-11	R998-80	R1 058-78	R1 119-13	R1 169-49
	SE9B2		After hours per request > 6kl (per 6kl or part thereof)	R942-11	R998-80	R1 058-78	R1 119-13	R1 169-49
	SE9B3		After hours per request < 5kl (per 5 kl or part thereof)	R942-11	R998-80	R1 058-78	R1 119-13	R1 169-49
	SE9B2		After hours businesses with Public Toilets per removal	R283-33	R299-83	R317-91	R336-03	R351-15
	SE9C1	Vacuum Tanker Service outside urban areas – Provided on request	Normal applicable Tariff (SE9A1 or SE9A2 or SE9A4) plus additional per hour plus SE9C2	R283-33	R299-83	R317-91	R336-03	R351-16
	SE9C2		Normal applicable Tariff (SE9A1 or SE9A2 or SE9A4) plus additional per km	R13-82	R14-63	R15-52	R16-40	R17-14
	SE9C6	After Hours Vacuum Tanker Service outside urban areas – Provided on request	After hours applicable Tariff (SE9B1 or SE9B2 or SE9B3) plus additional per hour plus SE9C7	R283-33	R299-83	R317-91	R336-03	R351-15
	SE9C7		After hours applicable Tariff (SE9B1 or SE9B2 or SE9B3) plus additional per km	R13-82	R14-63	R15-52	R16-40	R17-14
	SE9D1	Testing and Connection Fees	Testing of septic and conservancy tanks per test	R1 225-44	R1 229-04	R1 377-39	R1 456-52	R1 521-74
	SE9D2		Small bore sewerage connection fee + tank test	R5 625-44	R5 962-97	R6 320-87	R6 680-87	R6 981-74
	SE9D3		Sewer connection	R4 214-91	R4 467-80	R4 736-52	R5 006-09	R5 231-30
	SE9E1	Disposal	Charge per kl or part thereof	R61-40	R65-05	R68-96	R73-04	R76-52
Bulk services development fees	SEW10	Bulk services development fees		Development Contributions will be determined as set out in the Annexure in respect of Development Contribution Policy				
Illegal Connection / Tampering Fee	SE11A	1st Offence		R5 780-00	R6 126-80	R6 495-00	R6 866-00	R7 175-00
	SE11B	2nd Offence (SE11A x 2)		R11 560-0	R12 253-60	R12 990-00	R13 730-00	R14 348-00

TOPIC 8: WATER SERVICES INSTITUTIONAL ARRANGEMENTS AND CUSTOMER SERVICES

Overstrand Municipality is the official WSA for the entire Municipal Management Area and also acts as the WSP for the whole area. Current water services are delivered by way of an internally operated and managed mechanism. A Water and Waste Water Bulk Works Contract commenced on the 8th of December 2018 between Overstrand Municipality and Veolia Water Solutions & Technologies South Africa (Pty) Ltd to operate and maintain the bulk water services infrastructure in Overstrand Municipality's Management Area for a period of fifteen (15) years. The Municipality also has the right to extend the contract for a further five (5) years.

The updated Water Supply and Sanitation Services By-law was approved by Council on 26 April 2022.

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 overall performance of the municipality is managed and evaluated by a municipal scorecard (Top Layer SDBIP) at organisational level and through monitoring and evaluation of the detailed Departmental SDBIP at directorate and departmental (HOD) levels. The municipal scorecard (Top Layer SDBIP) sets out consolidated service delivery targets for senior management and provides an overall picture of performance for the municipality as a whole, reflecting the performance on each strategic objective and service delivery priorities. The SDBIP includes non-financial KPIs.

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

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 Overstrand Municipality across the eighteen key service areas, as identified through the Municipal Strategic Self-Assessment of Water Services process.

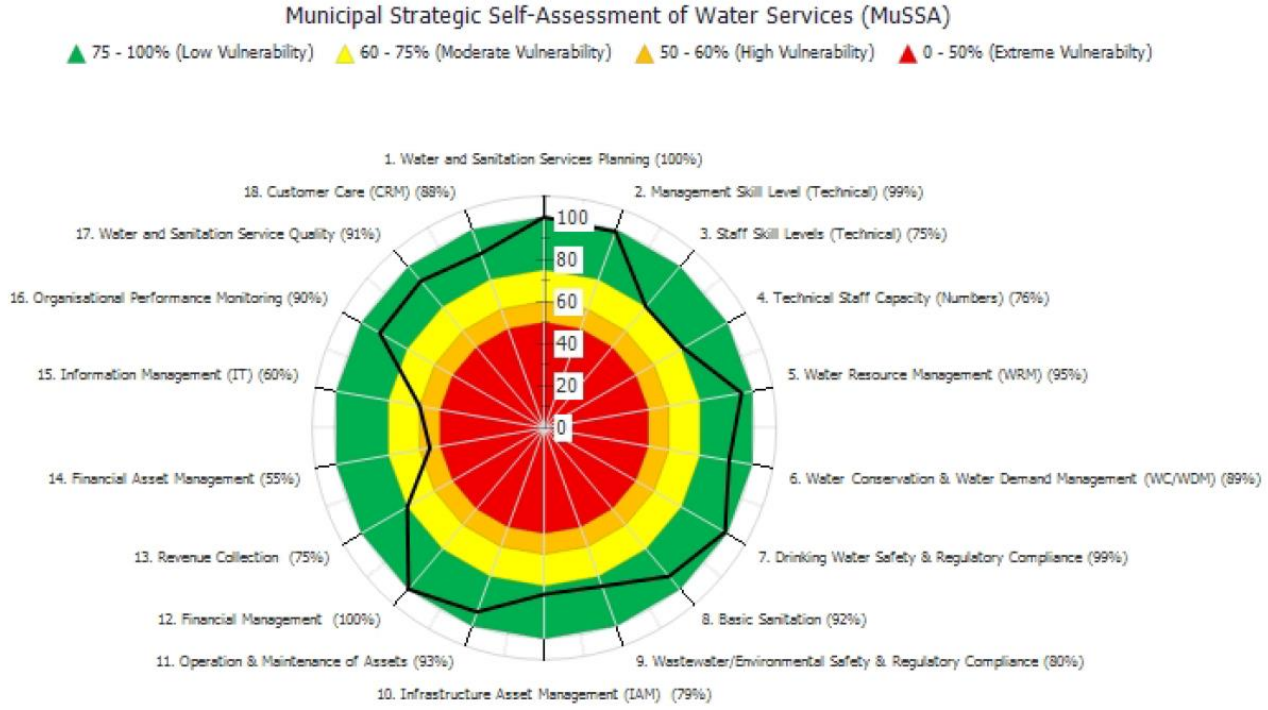


Figure A.8.1: Spider Diagram of the Vulnerability Levels of Overstrand Municipality for 2021

Overstrand Municipality's Vulnerability Index for 2021 was indicated as 0.19 "Low Vulnerability". The only area of concern evident from the 2021 assessment is Financial Asset Management (High Vulnerability, 55.0%).

In line with Overstrand Municipality's Vision – **to be a centre of excellence to the community** – the Municipality has developed a comprehensive customer care strategy. The strategy has been rolled out into consumer services charters for the following departments: electricity, water and sanitation, solid waste management and roads and storm water.

The consumer services charter for water and sanitation include the following commitments with regard to water services quality and service standards.

Our Purpose: To provide consumers with potable water and appropriate sanitation services.

Water Services Quality:

- We commit ourselves to supply – where the infrastructure allows – water that meets the standards set out for drinking water (SANS 0241) and treat effluent to a standard prescribed by law before disposal thereof into our water resources.
- We have a water quality management programme in terms of which potable water is frequently sampled at various places and tested by an independent accredited laboratory. The results of our treated water and effluent analyses are reported monthly to the Department of Water and Sanitation and thus monitored nationally.
- We strive to obtain Blue Drop status for all our water supply systems and Green Drop status for all our waste water systems when the National Department continues with these programs.

Our Service Standards: We will

- Respond to any reports about poor water quality within 12 business hours;
- Ensure that prolonged water supply interruptions (12 hours) are not more than 3 times per annum;
- Give 2 days prior notice in case of planned interruptions;
- Have an alternative supply of water available to meet basic needs in case of unplanned interruptions that last longer than 24 hours;
- Install new connections within 30 days or receiving the application and all prescribed requirements have been met;
- Clean up sewer overflows due to blockages in our system failure within 24 hours;
- Report the spillage of sewerage in a watercourse or sea to the relevant authorities within 24 hours of such occurrence;
- Promote the use of alternative water sources for irrigation and industry. Note that the use of grey water is allowed, but we may inspect such use and impose conditions;
- Upgrade and monitor telemetry systems, to act as an early warning system for e.g. pipe failures, reservoir overflows and sewer pump stations failures;
- Replace old consumer water meters in phases;
- Test water meters on request. If the meter complies with the specifications the consumer will be liable for the cost thereof. If the meter is faulty, there will be no cost for the consumer;
- Monitor and investigate individual municipal users, consumption on a monthly basis; and
- Monitor and investigate abnormal high or low water consumption of consumers.

A comprehensive Customer Services and Complaints system is in place at Overstrand Municipality. The Municipality has maintained a high and a very consistent level of service to its urban water consumers. Help-desks were developed at all the municipal administrations with the objective to assist customers. Disabled people are supported to do business from the help-desks. Requests by the illiterate are being captured and forwarded to the relevant official / section. All municipal buildings are accessible and wheel-chair friendly.

After hour emergency requests are being dealt with by the control room on a twenty-four hour basis. Requests are furthermore captured on an electronic works-order system to ensure execution thereof. All help desks were equipped with Batho Pele picture signage.

The table below gives a summary of the water and sanitation records that are kept by Overstrand Municipality and the maintenance work that was carried out over the last five financial years.

Table A.8.1: Water and Sanitation Indicators Monitored by Overstrand Municipality with regard to Customer Services and Maintenance Work

Service	Definition	All Areas				
		16/17	17/18	18/19	19/20	20/21
Sewerage connection	Provision of connection or inspection of existing connections	15	-	-	-	-
Smallbore Connections	Test new tanks smallbore	121	-	-	-	-
Sewer blockages	Repair blockages on main sewer pipelines up to connection points	1 421	1 668	1 823	1 828	2 032
Other sewer reticulation	Any other sewer reticulation inspections	58	99	152	106	156
PDA toilets repairs	Previously disadvantaged toilets repaired	263	165	188	137	151
Pipeline sewer	Installation of sewer pipelines or repair of pipelines	89	142	148	114	167
Investigate sewer reticulation pump stations	Work carried out at sewer pump stations	106	24	34	1	1
Replace water meters	Replace water meters	77	146	15	9	25
Test water meter	Testing of water meter for accuracy	21	17	24	20	23
Disconnect water connection	Disconnect supply	7	15	8	6	34
Install drip system	Installation and inspection of drip systems	-	1	1	-	0
Inspect water connections	Inspect connections	37	33	38	28	21
New water connections	New water connections	334	322	311	171	284
Other water connections	Inspections and work carried out at water connections	67	51	25	61	31
Pipelines water	Installation or repair of water pipelines	1	13	6	28	48
Pressure	Complaints with regard to pressure in the system	105	110	116	81	135
Water Pump Stations	Inspections and work carried out at water pump stations.	1	1	-	1	3
Repair pipe bursts	Repair of burst water pipelines	265	245	433	232	267
Reservoirs	Inspection of reservoirs and work carried out at reservoirs	2	4	4	-	7
Water Routine Inspections	Any water related inspections	-	-	-	-	0
Water Valves	Inspection of valves and work carried out on valves	7	7	2	6	14

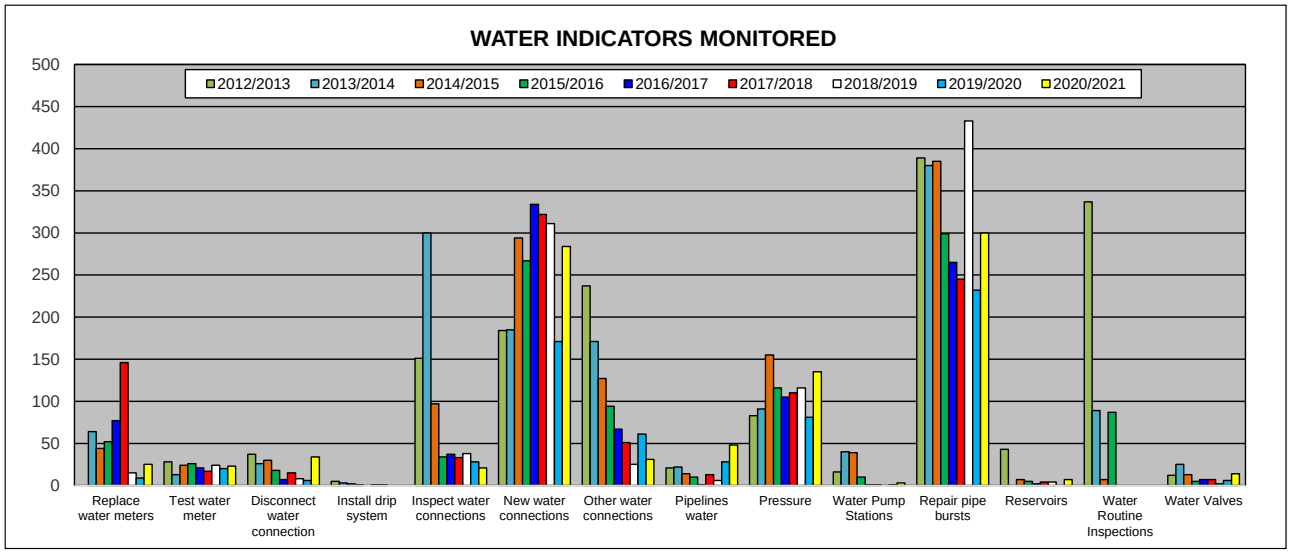


Figure A.8.2: Water Indicators Monitored by Overstrand Municipality

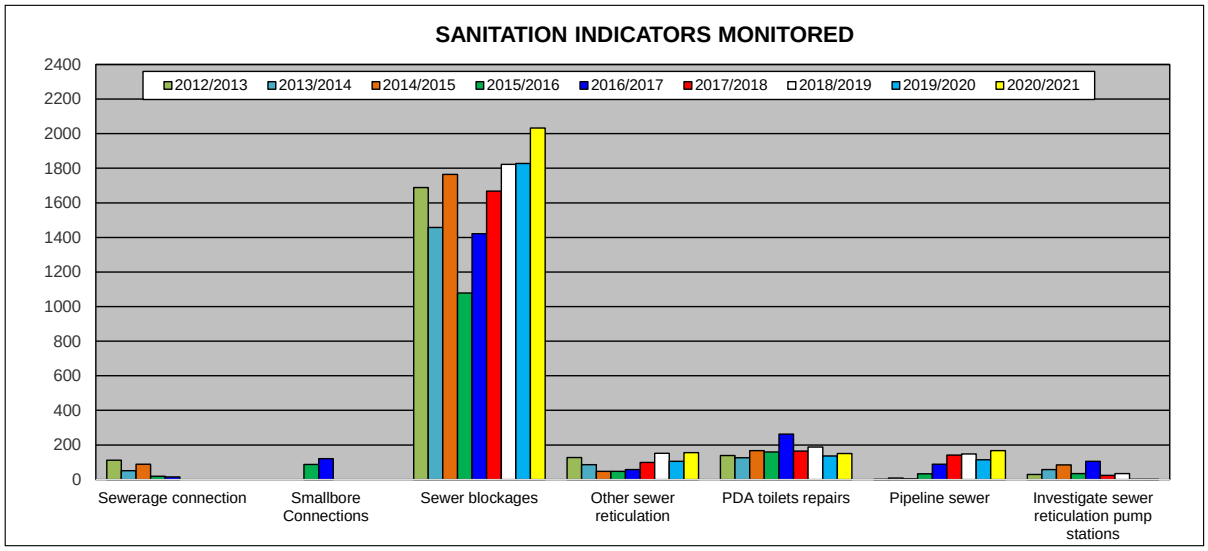


Figure A.8.3: Sanitation Indicators Monitored by Overstrand Municipality

DWS's Blue Drop Process

The DWS completed the Blue Drop PAT process for the WSAs in 2021. Blue drop status is awarded to those towns that comply with 95% criteria on drinking water quality management. The blue drop performance of Overstrand Municipality is summarised as follows in the DWS's 2014 Blue Drop Report, which was the last complete assessment done by the DWS.

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

Municipal Blue Drop Score	2011 – 90.56%, 2012 – 96.82% and 2014 - 90.79%

Regulatory Impression: The Overstrand Local Municipality team was well prepared and demonstrated their commitment to the Blue Drop assessment and water quality excellence. The Municipality is to be congratulated for obtaining Blue Drop status for the Greater Hermanus system. A decreased municipal score was however achieved during this assessment. The reason for the observed decrease in compliance includes:

- Full compliance with the requirements of SANS 241 with regard to monitoring and analysis could not be demonstrated. No chemical determinants have been analysed in the reticulation network to monitor the chemical quality of water provided to the consumer and identify any potential health impacts. In addition, the frequency of analysis does not comply with the requirements for the final water produced at treatment facilities receiving surface water or within the reticulation network. The Municipality however confirmed that subsequent to the assessment that a service provider has been appointed to implement a risk based monitoring programme that fully complies with the requirements of SANS 241, sampler training and uploading of analytical data to the BDS.
- Detailed annual process audits could not be demonstrated that assessed the performance of the treatment systems and each process unit with the design capacity of the plant. Recommendations should be incorporated into the review process of water safety plan.
- Poor microbiological compliance was observed in the Baardskeerdersbos system. This should be mitigated when the new plant to treat borehole water is commissioned in August 2014.

Significant progress has been made by the municipality with regard to WC/WDM and projects have been ongoing for the last three years. Good baseline information and a formal strategy are available that enables the municipality to make informed decisions regarding ongoing planning to minimise non-revenue water.

It is anticipated that the identified gaps will be addressed by the Overstrand Local Municipality and that an upward trend towards Blue Drop compliance will once again be achieved in the next assessment.

Based on the Audit results, the DWS has serious concerns on the poor microbiological drinking water quality and the resultant risk to consumers of the Baardskeerdersbos water supply system. These concerns have to be addressed as a matter of urgency and drinking water quality results and appropriate actions must be communicated to consumers should the water be found to be unfit for human consumption.

Site Inspection (Preekstoel WTW (88%) and Buffels River WTW (90%)): The site inspection impression at the **Preekstoel WTW** was considered to be good. A number of drinking water quality management practices still require attention, including:

1. A flow chart was displayed of the incident management protocol that indicates roles and responsibilities but alert levels were not included.
2. Records of the results of the jar tests that are routinely undertaken could not be provided.
3. Emergency shower and eye wash facilities were not located at the chemical dosing room.
4. Manual post dosing of lime was being undertaken at the time of the assessment due to equipment failure. This was to be repaired as part of the maintenance contract with an external service provider. Standby equipment was not installed.
5. Standby chlorine dosing equipment is not installed.

The site inspection impression at the **Buffels River WTW** was considered to be good. A number of drinking water quality management practices still require attention, including:

1. A flow chart was displayed of the incident management protocol that indicates roles and responsibilities but alert levels were not included.
2. The original O&M manual for the WTW is not available. Standard operating procedures have been compiled.
3. Records of jar tests undertaken by the service provider could not be provided.
4. Chemical tanks are not contained within a bounded area.
5. Standby chlorine dosing equipment is not installed.
6. Standby air compressor is not installed.

Table A.8.2: Blue Drop Performance of the Municipality (DWS's 2014 Blue Drop Report)								
Performance Area	**Baardskeerdersbos**	**Buffeljags Bay**	**Buffels River**	**Greater Gansbaai**	**Greater Hermanus**	**Kleinmond**	**Pearly Beach**	**Stanford**
Water Services Provider(s)	Overstrand LM	Overstrand LM	Overstrand LM	Overstrand LM	Overstrand LM	Overstrand LM	Overstrand LM	Overstrand LM
Water Safety Planning	29.75	23.54	33.43	31.50	33.43	31.15	24.59	29.75
Treatment Process Management	4.28	5.60	4.00	6.80	8.00	6.40	6.80	4.70
DWQ Compliance	0.00	15.75	23.25	23.25	29.60	23.25	29.60	30.00
Management Accountability	8.95	8.20	9.25	9.25	9.25	9.25	9.25	9.25
Asset Management	8.72	9.24	11.03	10.50	11.90	10.29	10.29	11.38
Use Efficiency, Loss Management	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Bonus Scores	9.17	6.50	3.25	4.00	1.27	3.25	3.83	2.86
Penalties	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue Drop Score (2014)	**63.87%**	**71.83%**	**87.20%**	**88.30%**	**96.44%**	**86.59%**	**87.35%**	**90.94%**
Blue Drop Score (2012)	91.6%	93.8%	95.0%	97.1%	97.9%	95.0%	95.2%	92.7%
Blue Drop Score (2011)	93.7%	75.4%	95.1%	95.1%	87.2%	93.1%	94.3%	95.2%
Blue Drop Score (2010)	Not Assessed	Not Assessed	63.83%	63.81%	75.31%	60.06%	Not Assessed	Not Assessed
System Design Capacity (Ml/d)	0.150	0.100	5.500	7.100	28.000	5.800	1.400	1.500
Operational Capacity (% i.t.o. Design)	100%	105%	44%	100%	29%	39%	100%	57%
Average daily consumption (l/p/d)	655.0	310.3	803.4	445.9	192.4	230.1	1605.4	159.9
Microbiological Compliance (%)	**90.0%**	**95.5%**	**99.9%**	**99.9%**	**98.9%**	**99.9%**	**99.9%**	**99.9%**
Chemical Compliance (%)	**92.0%**	**99.9%**	**96.4%**	**96.1%**	**96.4%**	**96.4%**	**99.9%**	**96.4%**

Overstrand Municipality also received their 2022 Blue Drop Risk Ratings early this year, as calculated from the 2021 assessment done by the DWS.

Table A.8.3: DWS's 2022 Blue Drop Risk Ratings for the Various Towns	
Municipal Blue Drop Risk Rating	**19.1%**

WSA Overview: All the Water Supply Systems (Baardskeerdersbos WSS, Buffeljags Bay WSS, Buffels River WSS, Greater Gansbaai WSS, Greater Hermanus WSS, Kleinmond WSS, Pearly Beach WSS and Stanford WSS) falls in the low-risk category.

Criteria A: The design capacities for all the Water Supply Systems were provided.

Criteria B: All the Water Supply Systems are operating within their design capacities.

Criteria C: All the Water Supply Systems achieved excellent compliance for Microbiological compliance (>98%), Microbiological Monitoring compliance (>80%), Chemical compliance (>98%) and Chemical Monitoring compliance (>80%), except Buffeljags Bay WSS which achieved adequate Chemical compliance of 92.3%

Criteria D: All the Water Supply Systems achieved excellent compliance (>90%) with technical skills which is an indication of relevant process controllers, supervisors and maintenance teams. However, Baardskeerdersbos WSS and Greater Gansbaai WSS have insufficient technical skills and this presents a risk with regards to operations and maintenance of these WSS.

Criteria E: All the Water Supply Systems achieved adequate compliance of 81.8% for Water Safety Planning and development of risk-based water quality monitoring programmes as outlined in SANS241:2015.

The Regulator encourages the WSA and WSP to urgently implement the following recommendations to ensure delivery of safe drinking water for all consumers.

- Implementation of corrective measures in the event of microbiological and chemical failures to always ensure delivery of safe drinking water.

Table A.8.3: DWS's 2022 Blue Drop Risk Ratings for the Various Towns								
Municipal Blue Drop Risk Rating								**19.1%**
• Appointment of suitably qualified staff (supervisors, process controllers and maintenance teams) aligned to set criteria. • Development of Water Safety Plan as per SANS241:2015 and WHO guidelines including risk assessment of entire supply system, water quality evaluation based on full SANS 241:2015 analysis of raw and final water, development of risk based monitoring programmes and implementation of mitigating measures to address all medium and high risks.								
Assessment Area	**Baardskeerdersbos**	**Buffeljags Bay**	**Buffels River**	**Greater Gansbaai**	**Greater Hermanus**	**Kleinmond**	**Pearly Beach**	**Stanford**
A: Total Design Capacity (Ml/d)	0.190	0.080	5.500	8.100	38.000	5.800	1.440	1.000
B: % Operational Capacity in terms of design	21.6%	12.8%	36%	43.8%	27%	39%	27.1%	86%
C1a: % Microbiological Compliance	100.0%	98.5%	100%	99.6%	100%	100%	100%	100%
C1b: % Microbiological Monitoring Compliance	100.0%	100%	100%	100%	100%	100%	100%	100%
C2a: % Chemical Compliance	99.5%	92.3%	97.7%	98.9%	99.3%	99.1%	99.3%	99.6%
C2b: % Chemical Monitoring Compliance	97.1%	97.1%	97.1%	97.1%	97.1%	97.1%	97.1%	97.1%
D: % Technical Skills	54.2%	91.7%	91.7%	91.7%	66.7%	91.7%	91.7%	91.7%
E: % Water Safety Plan Status	81.8%	81.8%	81.8%	81.8%	81.8%	81.8%	81.8%	81.8%
% BDRR / BDRR max	**12.8%**	**16.2%**	**16.7%**	**17%**	**20.7%**	**16.2%**	**13.9%**	**17.8%**

The average 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	**2017/2018**			**2018/2019**			**2019/2020**			**2020/2021**		
	Estimated Permanent Population	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consumption (l/p/d)**	**Estimated Permanent Population**	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consumption (l/p/d)**	**Estimated Permanent Population**	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consumption (l/p/d)**	**Estimated Permanent Population**	**Aver. Daily Billed Metered Res. Consump-tion (kl)**	**Aver. Daily consumption (l/p/d)**
Buffels River	2 932	724	**247**	3 053	743	**243**	3 180	797	**251**	3 312	852	**389**
Kleinmond	7 688	1 001	**130**	7 880	1 037	**132**	8 077	1 063	**132**	8 279	916	**111**
Greater Hermanus	61 462	6 566	**107**	64 197	6 189	**96**	67 054	6 376	**95**	70 038	6 368	**91**
Stanford	5 593	428	**77**	5 742	418	**73**	5 894	459	**78**	6 050	442	**73**
Greater Gansbaai	17 746	1 538	**87**	18 614	1 628	**87**	19 524	1 720	**88**	20 479	1 805	**88**
Pearly Beach	1 187	225	**190**	1 212	247	**204**	1 237	239	**193**	1 263	239	**189**
Baardskeerdersbos	126	18	**143**	126	17	**135**	127	20	**157**	128	17	**133**
Buffeljags Bay	151	7	**46**	152	8	**53**	153	8	**52**	154	7	**45**
All Systems	**96 885**	**10 508**	**108**	**100 976**	**10 288**	**102**	**105 246**	**10 682**	**101**	**109 703**	**10 646**	**97**

Note: The average residential billed metered consumption in the above table is for the period July to June each financial year, excluding the period November to February

DWS's Green Drop Process

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 Overstrand Municipality is summarised as follows in the DWS's 2022 Green Drop Report.

Table A.8.5: Green Drop Performance of the Municipality (DWS's 2022 Green Drop Report)	
Average Green Drop Score	**2009 – 63%, 2011 – 89%, 2013 - 89%, 2021 – 89%**

Regulatory Impression: Overstrand Municipality and WSP Veolia delivered a sterling performance that was awarded with an overall 89% Green Drop score. The municipality continues to maintain a remarkable record of 89% over 10 years, marked by a highlight committed, competent team. In addition, Gansbaai, Hermanus and Stanford were serious contenders for Green Drop Certification, which regrettably had to be waived due to not achieving excellent standards (>90%) on their final microbiological and/or chemical qualities. The WSA should be able to attain Certification status in 2023 if this matter can be resolved.

The Regulator is impressed with the level of preparation and professional conduct during the audit, represented by managers in various roles, supported by Veolia Water. All required information was loaded onto IRIS for various KPAs prior which ensure a seamless preliminary assessment. The team then used the main audit and verification audit events to maximise their scores by providing clarification and further evidence on sludge classification (landfilling), stormwater- and water demand management and capital projects. The striking performance and sustained services are not surprising if noting the strength of the engineering, technical, scientific, and laboratory competence, supported by committed senior management and municipal leadership. Perfect score (100%) were achieved for KPA Capacity Management for the expertise, supported by comprehensive operation, maintenance and monitoring plans and records, including financials and energy management. Human capacity is optimised via the adoption of automation and telemetry. This aspect must be taken up with the Regulator to align with capacity requirements to ensure that any risks associated with such innovations are managed. Flow monitoring is in place for inflow and outflow, and online monitoring for night flows (Mycity) is in place. Energy optimisation via LED is standard procedure and CO_2 equivalents are calculated to monitor the benefit. Well done. These best practices set a high standard for wastewater services in South Africa.

In a nutshell, the municipality performance exceptionally well in all KPA (>90%), with the exception of Effluent and Sludge Compliance. Areas for improvement include the laboratory turn-around time, monitoring of dedicated sludge streams and performance evaluation against design expectations, flow meter calibration / verification, sludge classification according to the WRC guidelines (noting new landfill regulations).

The adoption of site specific W_2RAP process is an encouraging; notably that risk management is informed and influenced by a process audit, sewer master plan and supported by budget for implementation. Improvement should focus on having (independent) Risk Reviews every 6 months to monitor (quantify) risk movement. The Regulator congratulates Overstrand and hope the 2023 audit cycle will result in an exponential improvement until Green Drop excellence is achieved for all six systems.

Green Drop Findings:

1. All WWTW achieved a full score for capacity management, thereby verifying the availability of registered and qualified process controllers, maintenance teams (inhouse and outsourced services), engineering, technical (technicians and technologists) and scientific expertise tied to wastewater management and asset planning.
2. W_2RAPs are in place and implemented and its impact monitored through operational monitoring and compliance monitoring.
3. All systems presented financial evidence viz. allocated budgets and expenditure, treatment cost (R/m³ treated), energy costs (R/kWh) and contracts for external services.
4. Six of six WWTWs logged full records for compliance monitoring, including biomonitoring.
5. Operational monitoring with online meters for most process streams are implemented. Gaps are still noted with regard to sludge monitoring of dedicated streams, e.g. in and output from settlers and thickeners, anaerobic digesters, belt presses, drying beds, etc.
6. High quality reports were presented for process audits, sewage inspection reports and sewer master planning.
7. Bylaws are updated and enforced.
8. Twelve months of data uploaded on IRIS for all six WWTWs, supported by relevant site-specific water use authorisation and general authorisations.
9. Sludge classification for landfill disposal is done, but not complemented by WRC classification – the latter not only intending to guide disposal but also to monitor the quality of biosolids produced by the site.
10. No penalties and no directives were issued for any systems.
11. No plants in the critical or high-risk positions.
12. Capital projects are part of a three-year plan, with 2021 projects listed as follows:
    - R6 700 000: Sewer network extension in Gansbaai WWTWs and associated infrastructure
    - R16 154 000: Hawston WWTW refurbishment on civil and mechanical equipment's for various unit processes.
    - R8 836 000: Hermanus WWTW refurbishments and associated infrastructure.
    - R1 645 000: Kleinmond WWTW refurbishments and associated infrastructure.
    - R1 797 000: Stanford WWTW refurbishments and associated infrastructure.

GREEN DROP REPORT CARD							
Key Performance Area	**Weight**	**Gansbaai**	**Hawston**	**Hermanus**	**Kleinmond**	**Pearly Beach**	**Stanford**
A: Capacity Management	15%	100%	100%	100%	100%	100%	100%
B: Environmental Management	15%	91.0%	85.0%	85.0%	86.0%	98.8%	92.0%
C: Financial Management	20%	98.0%	98.0%	98.0%	78.0%	97.5%	98.0%
D: Technical Management	20%	97.5%	97.5%	97.5%	93.5%	97.1%	97.5%
E: Effluent & Sludge Management	30%	70.0%	50.0%	85.0%	64.0%	62.5%	50.0%
F: Bonus		94.0%	94.0%	94.0%	94.0%	56.0%	94.0%
G: Penalties		0.0%	0.0%	0.0%	0.0%	-25.0%	0.0%
H: Disqualifiers		None	None	None	None	None	None
2021 Green Drop Score		**89% - 96%**	**89%**	**89% - 96%**	**88%**	**88%**	**89% - 90%**
2013 Green Drop Score		**92%**	**90%**	**91%**	**78%**	**NA**	**93%**
2011 Green Drop Score		**76%**	**88%**	**92%**	**83%**	**NA**	**83%**
2009 Green Drop Score		**66%**	**57%**	**66%**	**66%**	**NA**	**61%**
System Design Capacity (Ml/d)		2.000	1.000	12.000	2.000	0.259	1.200
Design Capacity Utilisation (%)		43%	61%	54%	76%	31%	89%
Resource Discharged into		Irrigation Sports Complex	Maturation Pond into Wetland	Ocean	Reed-bed / wetland area lined to sea	An aquifer	Constructed reed bed to Klein River
Microbiological Compliance (%)		68%	80%	87%	91%	100%	82%
Chemical Compliance (%)		86%	74%	98%	51%	58%	78%
Physical Compliance (%)		95%	62%	100%	88%	27%	82%
Wastewater Risk Rating (CRR% of CRR max)							
2011 CRR (%)		**31.0%**	**33.0%**	**35.0%**	**44.0%**	**NA**	**44.0%**
2013 CRR (%)		**35.3%**	**29.0%**	**45.0%**	**47.0%**	**NA**	**29.0%**
2021 CRR (%)		**41.2%**	**52.9%**	**36.4%**	**47.1%**	**52.9%**	**64.7%**

The Hermanus WWTW was inspected to verify the Green Drop audit findings (Hermanus WWTW Technical Site Assessment Score: 74%)

- The network and pumpstation was in good condition, noticed for routine maintenance and adequate response to sewage blockages.
- Trespassing seems to be a risk at the WWTW, compounded by land invasion close to the site. Neighbours to the WWTW resort to jumping over the fence to access their residence. Overstrand has plans to raise the wall to secure the facility and mitigate security risks.
- Plant infrastructure is aging; however, its lifespan is extended via preventative maintenance strategies. All equipment is functional.
- The site office displays certificates for PCs and WWTW – a satisfactory working environment is observed.
- Operational monitoring, daily logbook or maintenance records were in place.
- Safety signs were displayed at various unit processes i.e. chlorination, belt presses, lime storage, reactors, etc.
- Parts of the site was untidy and not evident of good groundskeeping – used as storage whilst network upgrades / refurbishments underway. Good housekeeping was evident at the maturation ponds.
- Sludge drying beds were not well kept and used only during emergency. Belt presses are used for primary sludge handling.
- Veolia Water developed a reactor control- and sludge management plan.
- All required documents were presented on site including comprehensive O&M manual with manufacturers specs, PFD and model of plant and record of all maintenance issues (job cards, works orders, tracking of outstanding jobs).

SECTION B: STATE OF WATER SERVICES PLANNING

DWS's new WSDP website was rolled-out to all the WSAs in the Overberg District on the 17th of October 2017. Overstrand Municipality populated the new WSDP website early in 2018, as requested by the DWS. The Water Supply and Sanitation Services By-law was also updated and the updated By-law was approved by Council on 26 April 2022.

The Municipality annually compile the WSDP Performance- and Water Services Audit Report, which is submitted to Council with the Annual Report. The WSDP Performance- and Water Services Audit Report gives an overview of the implementation of the Municipality's previous year's WSDP and can be seen as an annexure to Overstrand Municipality's Annual Report. The 2020/2021 WSDP Performance- and Water Services Audit Report will be approved by Council as part of the Municipality's Annual Report.

Water Safety Plans are in place for the distribution systems and treatment facilities. W_2RAPs are also in place for all the WWTWs and the sewer drainage networks.

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

The W_2RAP is an all-inclusive risk analysis tool by which risks associated with the management of collection, treatment and disposal of wastewater are identified and rated (quantified). The W_2RAP is used by Overstrand Municipality to manage the identified risks according to its potential impacts on the receiving environment / community / resources.

Detail WWTW Process Audits were compiled for all the WTWs (December 2021) and the WWTWs (June 2021).

The Water and Sewer Master Plans were updated during the 2020/2021 financial year and were incorporated into the WSDP. The Water and Sewer Master Plan process entails the establishment of computer models for the water systems and the sewer systems in Overstrand 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 Overstrand Municipality's water distribution and sewer drainage systems. All forward planning for water and sanitation services and water and sewerage infrastructure is guided by the Water and Sewer Master Plans.

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

- Water Master Plan, Overstrand Municipality, June 2021, GLS Consulting
- Sewer Master Plan, Overstrand Municipality, June 2021, GLS Consulting

The following water and sanitation related reporting and investigations were successfully completed during the 2020/2021 financial year.

- The Water Services Audit Report for 2019/2020 was finalised and approved by Council as part of the Annual Report. The NRW water balance models were updated for each of the distribution systems (Up to the end of June 2019) as part of the Water Services Audit Process.
- Overstrand Municipality continues with the implementation of their Drinking Water Quality and Effluent Quality Sampling Programmes (Both Operational and Compliance Monitoring). Sample results are loaded on a monthly basis onto DWS's IRIS. All the WTWs and WWTWs are registered on the IRIS website. The quality of the treated effluent re-used for irrigation purposes from the Hermanus- and Gansbaai WWTW is also sampled on a monthly basis.
- Overstrand Municipality is continuing with their Groundwater Monitoring and Management Programmes.

- The Asset Register was updated to include all the water and sewerage capital projects completed during the 2020/2021 financial year.
- Plant and Process Audits were done for the Kleinmond-, Hawston-, Hermanus-, Gansbaai- and Pearly Beach WWTW.
- The following Technical investigations were completed during the 2020/2021 financial year:
  - Buffels River and Kleinmond WTW Refurbishment Investigations: Conditional Assessment of Buffels River WTW.
  - Buffels River and Kleinmond WTW Refurbishment Investigations: Conditional Assessment of Kleinmond WTW.
  - Operation and Maintenance Manuals and Emergency Preparedness Plans were drafted for the Mossel River Dam and the De Bos Dam.
  - The Technical Feasibility Report for the Kleinmond WWTW was updated.
  - Augmentation of Potable Water Supplies to Hermanus – Seawater Quality Testing (Water Quality Report) was completed.
  - Clarifier Flow Balance Investigation was completed for the Hermanus WWTW.
  - Technical Report was completed for the proposed inlet pumping station for the Hermanus WWTW.
  - The updated Water and Sewer Master Plans were finalised. A Water Distribution System Pipe Replacement Study was also completed in October 2019 for all the water distribution systems in Overstrand Municipality.

Overstrand Municipality completed the following key water and sewerage capital infrastructure projects during the 2020/2021 financial year.

- Various sections of the water reticulation networks and sewerage pump stations were upgraded as recommended in the Water and Sewer Master Plans. Sections of the old water reticulation networks were also replaced (Implementation of the Pipeline Replacement Programme).
- The Municipality completed the construction of the new 4.0Ml Gansbaai and 1.5Ml Pringle Bay reservoirs.
- The Municipality completed the Hermanus Wellfield Phase 1 upgrade project. The project included the commissioning of two new Gateway boreholes with safe yields of 20 l/s and 25 l/s respectively, as well as two additional monitoring boreholes.
- An additional forty-nine (49) Communal toilets and twenty-four (24) communal taps were installed in various informal areas as emergency services.
- The Municipality started with the upgrade of the access roads to the Kleinmond and Buffels River WTWs.
- New fencing was installed at some of the water and sewerage infrastructure facilities to improve security.
- The Kleinmond and Gansbaai sewer networks were extended and the upgrading of the Kidbrooke sewer pipeline was completed. The Municipality also continued with the upgrading of the Zwelihle sewer network.
- The rehabilitation of the main bulk sewer to the Kleinmond WWTW (Phase 1) was completed.
- The Masakhane bulk sewer pump station was upgraded and the upgrading of the bulk sewer pipelines for supply area A&B (Masakhane) was started.

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 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 **KPAs and Strategies** of Overstrand Municipality are indicated below (2021/2022 IDP).

KPA.1: Basic Service Delivery

- Effective Development of municipal infrastructure.
- Promote proactive maintenance of municipal infrastructure.
- Promote the development, maintenance and management of Public Launching sites.
- Street and storm water maintenance.
- Replacement of deteriorating fleet items.

KPA.2: Good Governance

- Effective co-operative government within the Constitutional Mandate.
- Effective communication and community development.
- Sound municipal administration / institutional development.
- Enhance the involvement of ward committees in public participation.
- Enhance customer care.

KPA.3: Optimising Financial Resources

- Effective Financial Management.

KPA.4: Safe and Healthy Environment

- Enhancement of road safety.
- Law enforcement.
- Enhancement of fire and disaster management.
- Environmental Management.

KPA.5: Social upliftment and Economic Development

- Development of Integrated Human Settlements.
- Spatial planning.
- Local Economic Development and Tourism.
- Social development in a municipal context.
- Enhance sport, recreation and culture.

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

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

"Healthy water resources, for all, forever,"

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

TOPIC 1: SETTLEMENTS AND DEMOGRAPHICS

Topic C.1.1: Settlement Demographics and Public Amenities						
Section	**Intervention Required**	**% (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	100.0	All resources, especially surface water resources, need to be re-evaluated, especially where demand is close to the safe one in twenty year yields. Establish assurance of supply levels of all water sources. Continue with the implementation of the SDF and Growth Management Strategy for each of the towns and ensure that new developments are in line with these priority action plans. Ensure that the provision of bulk water and sewerage infrastructure are aligned with the Housing Strategy and that housing projects only continue once the required bulk water and sewerage infrastructure are in place.	100.0	Yes	92.9
Summary by Settlement Group	No	100.0				100.0
Assessment Score by Settlement Type	No	100.0				100.0
Amenities Summary	No	100.0				100.0

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 seven key strategies that should underpin all spatially related decision making in the Overstrand Municipality's Management Area, as included in Overstrand Municipality's Spatial Development Framework (May 2020), are as follows:

Table C.1.2: Seven Key Strategies that should Underpin all Spatially Related Decision Making (SDF)	
Spatial Development Strategy	**Strategy**
Managing Population Growth and In-migration	Adopt a selective "supply driven" approach by only providing for housing growth and related community facilities in the urban areas where the highest potential for sustained economic growth exists.
Mixed Use Densification	Implement a bold mixed use densification policy which earmarks densification areas within urban settlement in order to accommodate growth in the Overstrand based on the extremely limited amount of greenfield land available for development.

Table C.1.2: Seven Key Strategies that should Underpin all Spatially Related Decision Making (SDF)	
Spatial Development Strategy	**Strategy**
Housing Strategy	Eliminate the current housing need based on the revision of the Overstrand Human Settlement Plan. The key principle of this plan being the establishment of human settlements which include the required community facilities, are located in proximity to economic opportunities etc.
Bulk Service Infrastructure Provision	Compile a co-ordinated bulk infrastructure supply provision policy, which prioritises the implementation of bulk infrastructure based on the municipality spatial development concept – Growth Management Framework.
Initiate – Place specific key economic development projects / drivers	Stimulate economic growth and development linked to the comparative locational advantage. Municipality must identify and actively facilitate key catalyst projects in conjunction with strategic partnerships with business / investors.
Priority areas for biodiversity conservation	All public owned land (including State property, Municipal and Provincial property) that is of high conservation importance is to be included in a formal municipal protection area network. The mechanism being to establishing contract nature reserves negotiated in conjunction with the WCNCB conservation stewardship programme, providing legally binding guidelines for land use.
Rural development strategy	Rural development to be informed by the DEADP Rural Development Guidelines (2017), where applicable.

The concept of using a Growth Management Strategy to promote the long term sustainability of the municipal area and its sub-region is strongly supported by the Overstrand Municipality's Council. The Growth Management Strategies for the various areas identifies and discusses the factors that affect densification within the context of the Overstrand Municipal Area and include the proposed strategies and associated policies.

Recommendations were also made in the Growth Management Strategies regarding the proposed densification priority areas for the next five years and the strategic actions required for the implementation thereof.

A Housing Strategy is in place and the main vision of the Strategy is to not only eradicate the current housing backlog, but to develop and plan for future integrated communities and settlements that would be able to sustain the growing needs for housing in such a way that all people will benefit from the housing developments.

The table below gives an overview of the Objectives of the Housing Strategy, as well as the Housing Programmes and Related Projects (2021/2022 IDP).

Table C.1.3: Objectives of the Housing Strategy and Housing Programmes and Related Projects	
Objectives	**Housing Programmes and Related Projects**
• Upscale provision and implementation of serviced sites. • Increasing densities of new human settlement developments on well-located land. • Reduce bulk infrastructure as a constraint to human settlement development. • Acquiring well-located land for well-planned integrated Human Settlements. • Provide a fair allocation of housing opportunities. • Increase beneficiary involvement in the development of housing opportunities. • Enhancing supply of new rental housing opportunities and encourage improved property management and rental stock. • Increase sustainable resource use by exploring alternative technologies and building methodologies. • Implement Overstrand Municipal Growth Management Strategy.	• Integrated residential Development Programme • Upgrading of Informal Settlements • Provision of Economic & Social Facilities • Institutional Subsidies • Enhanced People's Housing Process • Emergency Housing Programme • Social Housing Programme • Community Residential Units

A detailed action plan has been set in place to reduce the backlog and address the current and future housing need. The Housing Strategy Five-Year Plan will incorporate several housing programmes, each focused on and addressing different needs. The Overstrand Municipality has compiled a comprehensive 5 Year Human Settlement Programme to guide and improve housing development and is specifically focused on delivery within the Municipality. The Programme is updated and revised on a six-monthly basis due to the rapid changing environment in which it operates. Funding allocations from the Provincial Department of Housing are amended from time to time and subsidy amounts are also revised from time to time.

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	100.0	Assist private landowners as far as possible with the provision of basic water services to all the households in the Municipality's Management Area with existing water service levels below RDP standard, once practical guidelines and funding become available from the DWS.	100.0	No	28.6
Direct Backlog Sanitation	Yes	100.0	Assist private landowners as far as possible with the provision of basic sanitation services to all the households in the Municipality's Management Area with existing sanitation service levels below RDP standard, once practical guidelines and funding become available from the DWS.	100.0	No	28.6
Water Services Infrastructure Supply Level Profile	No	100.0				100.0
Water Reliability Profile	Yes	100.0	Continue with the provision of communal services in 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.	100.0	Partially	92.9
Sanitation Service Infrastructure Supply Level Profile	No	100.0				100.0
Sanitation Reliability Profile	Yes	100.0	Continue with the provision of communal services 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..	100.0	Partially	92.9
Water Services: Education	No	100.0				100.0
Water Services: Health	No	100.0				100.0
Sanitation Services: Education	No	100.0				100.0
Sanitation Services: Health	No	100.0				100.0
Health and Educational Facilities	No	100.0				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?

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

The service levels to be provided by Overstrand Municipality to the consumers in their Management Area are included in the Consumer Charter and also in the Water Supply and Sanitation Services By-law. All water and sanitation services provided by Overstrand Municipality to consumers within the Municipal Management Area are linked to the Municipality's Tariff Policy and Rates Policy and poor households are incorporated through Overstrand Municipality's Indigent Policy.

The large number of residents in the lowest income groups (living in informal areas) places a major challenge on Overstrand Municipality to provide suitable housing.

Overstrand 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 don't pay for water. Therefore a contract was awarded for the maintenance of these facilities.

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

Free basic water policy:

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

Free basic sanitation policy:

- Provision of the most appropriate sanitation facility to the poor household.
- Health and hygiene promotion must be provided in a co-ordinated manner and must be properly managed and adequately funded if free basic sanitation is to become a reality. This requires close collaboration between the EHPs of the Overberg District Municipality responsible for environmental health and Overstrand Municipality.
- Subsidising the operating and maintenance costs. If the basic service is to be provided free to the poor then Overstrand Municipality must ensure that the costs of providing the service are covered by the local government equitable share and / or through cross-subsidies within Overstrand 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 Overstrand 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. Overstrand Municipality is however committed to work with the Education Department to address any possible shortcomings with regard to the provision of water services that might exist at any school or tertiary education facilities. It is important for the schools in Overstrand Municipality's Management Area to focus on Water Demand Management activities and for Overstrand Municipality to continue to support the schools with WC/WDM initiatives.

Public Amenities Health: All medical facilities in Overstrand 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.

Overstrand Municipality will strive to continue to ensure that the minimum required SANS241:2015 water quality standards are met through proper management, operation and maintenance of their WTWs and the systematic upgrading of their WTWs when required. The monitoring of provision of basic minimum services to farm dwellers remains a challenge, in view of the limited funding and human resources.

The environmental health function is currently with the Overberg District Municipality. The Municipal Health Services of the Overberg District Municipality also report monthly to the Department of Health on water quality. The quality of life of the people within a Municipality is influenced by the available health care. Various 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 be maintained between the Overberg District Municipality and Overstrand Municipality with regard to environmental health issues and that a good communication protocol is followed between the District Municipality and Overstrand Municipality to report on health issues.

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

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

Overstrand Municipality further needs to promote health and hygiene awareness amongst standpipe users by focusing on the following:

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

The rehabilitation and maintenance of the basic services in informal areas have also had positive results, in that the installations appear neater, a healthier environment has been created and less pollution than previously takes place. It is believed that this played a significant role in reducing disease previously caused by unhygienic conditions and absence of basic services.

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

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

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

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	No	100.0				100.0
Operation	No	100.0	Implement recommendations from the Water Safety Plans and WTW Process Audits. Improvement/Upgrade plans to be implemented.	100.0	Partially	92.9
	No	100.0	Implement recommendations from the W_2RAPs and WWTW Process Audits. Improvement/Upgrade plans to be implemented.	100.0	Partially	92.9
Functionality Observation	No	100.0	Provide additional reservoir storage capacity for the towns with inadequate storage capacity. Upgrade existing water pump stations and provide new water pump stations for the identified areas. Upgrade existing WTWs and WWTWs as recommended. Upgrade existing sewer pump stations and provide new sewer pump stations for the identified areas.	100.0	Partially	92.9
Asset Assessment Spectrum	No	100.0	Increase O&M budget for repairs and maintenance of infrastructure. A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of the existing water and sewerage infrastructure (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).	100.0	Partially	92.9
Water and Sanitation schemes	No	100.0	Upgrade sections of the water reticulation network and sewer drainage network as proposed in the Water and Sewer Master Plan	100.0	Partially	92.9

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 draft 2020/2021 Annual Report list the following water and waste water (sanitation) services challenges.

- Vandalism and theft of water infrastructure and equipment;
- Aging water infrastructure;
- Additional water source required for Hermanus in the medium term;
- Need for the upgrade of WWTWs in some areas;
- Extension of waterborne sewer networks;
- Sludge handling according to legislation;
- Extension of basic sanitation services;
- Lack of knowledge of sewer systems by consumers;
- Ageing sewerage infrastructure / lack of maintenance funds;
- Storm water infiltration into sewer networks;
- Sewer blockages; and
- Conservancy tank service (tanker trucks).

Asset Management Plan: It is believed that the technology and the expansion of infrastructure and the personnel capacity has not been developed in the same manner, accordingly the human resources previously found it difficult to operate and maintain the infrastructure and did not necessarily have the skills to operate the infrastructure optimally. The Water and Wastewater Bulk Works Contract ensures the adequate operation and maintenance of the WTWs and WWTWs and the other bulk water and sewerage infrastructure.

The Municipality's current Asset Register is adequate for the information required for the WSDP. An Asset Management Policy is also in place to ensure efficient, effective and optimal management, operation and maintenance of all assets, which includes treatment plants, reservoirs, structures, buildings, pipelines, sites, etc. An Asset Management Plan also needs to be drafted with the following purpose.

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

An Asset Management Plan 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.

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

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

Disaster Management Plan: An updated Disaster Management Plan is available for Overstrand Municipality. The role of the Disaster Management Unit include the following.

- To compile and adopt a disaster management policy;
- Compile and maintain disaster management plans / framework;
- Establish a disaster management committee; and

- Establish community partnerships that combine the access and attributes of everyone with a stake in disaster resistance.

Risk reduction includes: Risk awareness programs; Risk prevention programs; Formal and informal training about emergency services and disaster relief; Research in formal and informal settlements about location, growth and development and Upgrading of vehicles, equipment and protective clothing.

The 2021/2022 IDP include the following Disaster Management Analysis for Overstrand Municipality.

Table C.3.2: Disaster Management Analysis for Overstrand Municipality

Functions		Yes	No	Comments, if No
A Hazard, Risk and Vulnerability Assessment have been performed.	For the Municipal Area		X	Budget and capacity constraints
	For projects identified in the IDP		X	New function, no projects in place. No budget for projects.
The identified disaster risks have been prevented or mitigated through the implementation of risk reduction programmes.	For the Municipal Area	X		
	For projects identified in the IDP		X	New function, no projects in place. No budget for projects.
Appropriate disaster preparedness, response and recovery plans have been developed for a risk that cannot be prepared or mitigated.	For the Municipal Area	X		
	For projects identified in the IDP		X	New function, no projects in place. No budget for projects.
The Municipality has instituted the following disaster management requirements.	Establish a functional Disaster Management Centre		X	Budget Constraints
	Appoint a Head of Centre		X	Don't have a Centre
	A functional Disaster Management Advisory Forum		X	DMAF to be established. Provincial Government hosted presentation on importance of DMAF.
	A Disaster Management Plan has been developed	X		
	This DM Plan does include Sectoral Plans.	X		
Disaster Management has functional systems that comply with the following.	GIS data for disaster management		X	Limited DM Capacity
	Risk reduction planning		X	Limited DM Capacity
	Early warning system		X	Budget Constraints
	Preparedness, response and recovery planning (Generic Plan)	X		
These systems are linked to:	Other line functions in the Municipality		X	Overberg District
	Other Municipalities	X		
	Security Forces (SAPS and SANDF)		X	Overberg District DMC
	Provincial MES		X	Overberg District DMC
	Provincial Departments		X	Overberg District DMC
	The National Disaster Management Centre		X	Overberg District DMC
The Municipal Disaster Management Plan is completed, submitted and approved by:	Other Municipalities in District Municipal Area	X		
	District Municipal Disaster Management Centre	X		
	Provincial Disaster Management Centre	X		

Untreated Effluent Management Plan: There are no known untreated effluent discharges to the environment. The W_2RAP include Management Procedures and Incident Response and Emergency Protocols to respond to incidents.

Future Water and Sewerage Infrastructure Requirements: The Water and Sewer Master Plans (June 2021) for the various distribution and drainage systems in Overstrand Municipality's Management Area recommends upgrades of the water and sewerage infrastructure to the values indicated in the table below in the foreseeable future in order to accommodate development and population growth according to the SDF.

Table C.3.3: Summary of the Future Water and Sewerage Infrastructure Requirements for Overstrand Municipality, as included in the 2021 Water and Sewer Master Plans

Zone / Area	Water Infrastructure	Sewerage Infrastructure	Total
Buffels River	R52 112 000	R362 954 000	R415 066 000
Kleinmond	R5 623 000	R65 460 000	R71 083 000
Greater Hermanus	R191 077 000	R186 234 000	R377 311 000
Stanford	R16 778 000	R13 458 000	R30 236 000
Greater Gansbaai	R178 917 000	R314 524 000	R493 441 000
Pearly Beach	R9 986 000	R54 833 000	R64 819 000
Baardskeerdersbos	R4 155 000	R5 424 000	R9 579 000

Table C.3.3: Summary of the Future Water and Sewerage Infrastructure Requirements for Overstrand Municipality, as included in the 2021 Water and Sewer Master Plans			
Zone / Area	**Water Infrastructure**	**Sewerage Infrastructure**	**Total**
Buffeljags Bay	R50 000	R537 000	R587 000
Overberg Water	*R448 691 000*	-	*R448 691 000*
Total (Excluding Overberg Water)	**R458 698 000**	**R1 003 424 000**	**R1 462 122 000**

Notes: 1) Costs include P&G's, Contingencies & Fees, but exclude EIA studies, registration of servitudes and/or land acquisition and VAT.

2) The above requirements do not include the cost for the upgrading or the refurbishment of the WTWs and WWTWs or the cost for the augmentation of the water resources for the various towns.

GROUNDWATER INFRASTRUCTURE

Overstrand Municipality will continue with the implementation of their Groundwater Monitoring Programmes for areas where groundwater is abstracted. The groundwater monitoring data is regularly processed, analysed and reported on by experienced hydrogeologists in order to ascertain whether the resources are being sustainably utilised and to ensure compliance with the approved Groundwater Monitoring Programmes 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. Over-abstraction close to the coastline can also result in seawater intrusion into the aquifer, and irreversible damage to the system.

- 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 in place. It is important for Overstrand 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.

Table C.3.4: Key Groundwater Management Functions (Best Practice)				
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	The authority that is responsible for water supply.	Project management	In house technical staff, suppliers, contractors, specifications.	

Table C.3.4: Key Groundwater Management Functions (Best Practice)				
Activity	**Responsible Person**	**Skills and qualifications required**	**Resources, tools and equipment**	**Remarks**
water meters for measuring abstraction.				
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)

WATER TREATMENT WORKS INFRASTRUCTURE

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

Table C.3.5: Existing Capacities and Flows at each of the WTWs (Ml/d)						
WTW	**Existing Hydraulic Capacity**	**Peak Month Average Daily Flow**	**Average Daily Flow (Jul 2020 – Jun 2021)**	**Average Daily Flow as a % of Capacity**	**Current Required Treatment Capacity (1.5 x AADD10yr)**	**2020/2021 Water Quality Failures (SANS0241:2015)**
Buffels River	5.500	2.559 (Dec 20)	2.117	38.5%	4.065	pH
Kleinmond	5.800	2.921 (Dec 20)	2.412	41.6%	4.631	-
Preekstoel & Bio-filtration	38.000	14.857 (Jan 21)	11.622	30.6%	23.429	-
Stanford	1.000	1.418 (Jan 21)	1.223	122.3%	2.349	-
Franskraal	6.500	3.659 (Febr 21)	3.073	47.3%	6.194	-
De Kelders	1.600	1.187 (May 21)	0.949	59.3%	1.600	-
Pearly Beach	1.440	0.673 (Jan 21)	0.420	29.2%	0.807	-
Baardskeerdersbos	0.185	0.076 (Febr 21)	0.049	26.5%	0.093	-

Buffels River WTW: The WTW treats water from the nearby Buffels River dam for usage in the Rooi Els, Betty's Bay and Pringle Bay areas. Under normal circumstances the plant is operated below its design capacity and is only in operation for approximately eight (8) hours per day. There is therefore considerable spare capacity available by operating the plant for longer duration per day and no capacity increase will be required in the near future. The Buffels River distribution system received two consecutive Blue Drops in 2011 and 2012 and a Blue Drop score of 87.2% in 2014, which was the last complete assessment done by the DWS. The 2022 Blue Drop Risk Rating for the Buffels River supply system was 16.7% (Low).

The recommendations from the detail Buffels River WTW Process Audit (December 2021) are indicated in the table below.

Table C.3.6: Recommendations from the Buffels River WTW Process Audit		
Item	**Recommendation**	**Planning Priority**
Process Unit Performance Assessment		
Flocculation / Chemical	• Formalise soda ash dosing configuration. • Expedite repairs to inlet flow meter.	Medium Short
Settling	• Monitor turbidity values for the individual settling tanks.	Long
Filtration	• Record actual "Filter-to-waste" durations. • Perform Specific Deposit determination on filter media (Refer to Chapter B3 of "Handbook for the Operation of Water Treatment Works") • Investigate underdrain system. Re-install nozzles in a more secure manner. • Monitor (and record) turbidity values for the individual filters.	Medium Long Medium Long
Disinfection	• Install a formal, fixed treated water sampling point. • A formal plan for dealing with a chlorine leak needs to be developed. • Current stacking practices related to cylinders needs to be addressed. • There should be 30 days stock on site. • Ideally, every process controller should have his/her own full-face mask. • Having spare chlorine connector lines, "pigtales", on site is always advisable.	Short Medium Long Medium Medium Long
Plant Condition Assessment		
Civil Works	• Redo internal paintworks and perform some general building maintenance.	Long
Mechanical	• Ensure routine preventative maintenance is performed.	Medium
Electrical	• N/A	
Operational Assessment		
Operational Monitoring	• Ensure spreadsheet is being kept up to date. • Process Controllers to actively use operational data. • Process Controllers to receive regular lab feedback. • Verify the calibration of the equipment used on site. • Include Electrical Conductivity in the daily testing. • Continue monitoring Iron and Aluminium	Medium Medium Medium Medium Short Long
Occupational Health and Safety	• Update signage on site. • Ensure all relevant safety equipment is on site. • Test safety showers on a regular basis. • Provide barrier to contain any chemical leaks. • Repair handrails. • Provide a fence around the site.	Long Long Long Short Medium Long
Housekeeping	• Tidy up grounds / walkways. • Ensure mechanical equipment remains clean.	Long Long
Maintenance	• Ensure Process Controllers are to be aware of the Preventative Maintenance Schedule. • Ensure records/ logbooks pertaining to preventative maintenance are also available on site.	Medium Medium
Administrative Assessment		
Water Safety Plan and Incident Management Protocol	• Start sensitizing Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.	Long

The WTW structure is 35 to 45 years old except for the new flocculation and sedimentation tanks that were added in 2008. The WTW comfortably meets the coagulation, flocculation and sedimentation requirements given the oversized flocculation and settling tanks. The Refurbishment Investigation (Conditional Assessment) of the Buffels River WTW, as completed in August 2020, indicated the following challenges:

- Filtration was identified as the bottle neck limiting the capacity of the WTW. Due to the low driving head, the filters are effectively limited to an average filtration rate of 45 l/s (160 m^3 /h over 20 hours, or 3.2 Ml/d). This can be remedied by increasing the driving head by lowering the outlet weir level. Further, the current filter backwash is inadequate to clean the filters. This can be fixed by increasing the size of the header tank to provide the necessary backwash water volumes.

- The WTW chlorine dosing facilities appear to be undersized and there is no chlorine contact tank. Baffles can be introduced to the reservoir on site to increase the dispersion factor to avoid constructing a new chlorine contact tank. The chlorine room which does not meet SANS health and safety standards and poses a health risk.

- The water is aggressive and there is no provision for stabilisation of the water. Hydrated lime or limestone contact tanks are proposed with the latter being recommended.

- Process monitoring and chemical optimisation can also be improved by adding in-line pH meters and monitoring chemical dosages.

- The waste streams from the WTW are poorly managed and sludge currently overflows into the environment. There is no dedicated backwash recovery system, and the sludge settling tank is not operational. It is proposed that a new backwash recovery system is introduced and the existing sludge settling tank be dedicated to sedimentation desludging streams only.

The majority of the mechanical equipment on site is in working order but requires ongoing maintenance. A few valves need to be replaced along with the modifications to the flowmeter.

In general, the electrical infrastructure is in a working condition aside from some minor problems. These can be fixed by testing and repairing all electrical panels and wiring. In the long term, the MCC should be replaced along with the electrical and instrument cabling. The control system and SCADA should also be upgraded.

A structural conditional assessment along with core sample testing revealed that the majority of the structures are generally safe and there is no urgent need to condemn any of them. A few key areas were highlighted that need immediate repair such as the chemical dosing area, the steel conveyor belt and all places with spalling. There will be ongoing maintenance and repair work required, in particular to ensure leaks do not arise in the structure and removal of the asbestos superstructure but these do not pose immediate risks to the operators or surroundings.

Kleinmond WTW: The WTW treats water from the Palmiet River and from a fountain for usage in Kleinmond. The plant operates well within its design capacity. The Kleinmond WTW is generally operated and maintained satisfactorily. The Kleinmond distribution system received a Blue Drop award in 2012 and a Blue Drop score of 86.59% in 2014, which was the last complete assessment done by the DWS. The 2022 Blue Drop Risk Rating for the Kleinmond supply system was 16.2% (Low).

The recommendations from the detail Kleinmond WTW Process Audit (December 2021) are indicated in the table below.

Table C.3.7: Recommendations from the Kleinmond WTW Process Audit

Item	Recommendation	Planning Priority
Process Unit Performance Assessment		
Flocculation / Chemical	• Provide standby Flocculant Dosing Pump	Medium
Settling	• Monitor turbidity values for the individual settling tanks. • Provide flow control to the individual settling tank inlets.	Long Medium
Filtration	• Control flow to the filters as to ensure they are equally loaded. • Install a second Backwash Pump and Blower. • Perform Specific Deposit determination on filter media (Refer to Chapter B3 of "Handbook for the Operation of Water Treatment Works")	Medium Medium Long
Disinfection	• Current stacking practices related to cylinders needs to be addressed. • There should be 30 days stock on site. • Ideally, every process controller should have his/her own full-face mask. • Having spare chlorine connector lines, "pigtales", on site is always advisable.	Long Medium Medium Long
Plant Condition Assessment		
Civil Works	• Redo internal paintworks and perform some general building maintenance.	Long
Mechanical	• Repair water leaks / attended to rust before situation deteriorates. • Ensure routine preventative maintenance is performed.	Long Medium
Electrical	• Repair / Make safe all electrical connections.	Long

Table C.3.7: Recommendations from the Kleinmond WTW Process Audit		
Item	**Recommendation**	**Planning Priority**
Operational Assessment		
Operational Monitoring	• Ensure spreadsheet is being kept up to date. • Process Controllers to actively use operational data. • Process Controllers to receive regular lab feedback. • Verify the calibration of the equipment used on site. • Include Electrical Conductivity in the daily testing. • Continue monitoring Aluminium	Medium Medium Medium Medium Short Long
Occupational Health and Safety	• Update signage on site. • Ensure plant personnel are all familiar with how to use the equipment provided. The chlorine training provided is noted in this regard. • Test safety showers on a regular basis. • Provide barrier to contain any chemical leaks. • Repair handrails.	Long Long Long Short Medium
Housekeeping	• Tidy up grounds. • Ensure mechanical equipment remains clean.	Long Long
Maintenance	• Ensure Process Controllers are to be aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site.	Medium Medium
Administrative Assessment		
Water Safety Plan and Incident Management Protocol	• Start sensitizing Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.	Long

The Conditional Assessment of the Kleinmond WTW, as completed in June 2021, indicated the following conclusions and way forward for the plant.

- The treated water currently meets all SANS:241 (2015) criteria.
- All process units can meet criteria at 61 l/s.
- Sedimentation was identified as the bottleneck limiting the capacity of the WTW to 61 l/s followed by filtration with a capacity of 64 l/s. Modifications to the inlet configuration at the lamellas to improve settlement thereby improving operation would theoretically increase sedimentation capacity to 85 l/s. This results in filtration as the limiting capacity
- Both filter backwash and sedimentation sludge is directed to a backwash holding tank where it gravitates to the Kleinmond WWTW. There is no recovery system. It is recommended to add pumps in the backwash holding tank to recover filter backwash and to direct sedimentation sludge to the sewer directly bypassing the backwash holding tank.
- Process monitoring and chemical optimisation can also be improved by adding in-line pH meters and monitoring chemical dosages.
- From theoretical calculations, the water is aggressive, but clearwell and reservoir walls should be inspected more thoroughly before dosing additional chemicals.
- An additional water source is used called Dorpsfontein fountain. The fountain currently contributes 7% of total flow i.e. it has an average flowrate of 145 kl/d. The source is added directly into the treated water reservoir. No water quality data could be sourced, and it is highly recommended to test this water as it bypasses the WTW.

A majority of the mechanical equipment on site is in working order but requires general valve and pump maintenance.

In general, the electrical infrastructure is in a working condition. The WTW does not have a SCADA system but rather a SCADA mimic. All equipment at the WTW is controlled by switching them on and off on the MCC panels next to the equipment. The high-lift pumps were previously controlled using radio telemetry, but this stopped functioning forcing the operators to drive to the pumpstation. In the short term, the telemetry can be fixed and testing and repairing of all electrical panels and wiring is recommended. In the long run (and in the interest of the municipality) the electrical and electronic infrastructure can be upgraded to allow for all equipment to be controlled through a centralised SCADA system. This upgrade may help optimise the WTW, but not necessary for the operation of the works.

The high, medium and low refurbishment priorities for the Kleinmond WTW and the estimated costs are indicated in the table below.

Table C.3.8: High, Medium and Low Refurbishment Priorities for the Kleinmond WTW

Criteria	High Priority	Medium Priority	Low Priority
Plant performance	• Condition assessment of the rising main • Sedimentation tank lamella plates		• Treated water stability. • Additional chlorinator. • Improve Dorpsfontein fountain disinfection.
Improved operations and control	• Backwash water recovery system. • Sedimentation sludge bypass system.	• Fix flow measurement at the Palmiet Booster pump station. • Allowance to start and stop booster pumps from WTW. • Blower and backwash pump redundancy.	• Chemical dose monitoring. • In-line pH meter. • Electrical control and instrument upgrade.
Safety	• Fix safety shower in chemical storage and add a new shower in the dosing area. • Improve chlorine dosing facility. • Filter float valve access. • Testing Dorpsfontein fountain water quality.		
Longevity	• Inspect reservoir internal walls		• Brick plaster in flocculation tanks.
Operator comfort			• Reconfigure admin area
General maintenance		• Valve maintenance. • Pump maintenance. • EC&I maintenance.	
Total Cost (Excl. VAT)	**R1 780 000**	**R1 650 000**	**R6 350 000**

Preekstoel WTWs:

- The Preekstoel WTW treats water from the De Bos dam for usage in the Greater Hermanus area.
- The bio-filtration plant treats groundwater from the Hemel en Aarde boreholes (Camphill and Volmoed), before it is further disinfected at the Preekstoel WTW.
- The chemical oxidation treatment plant treats water from the Gateway boreholes, before it is further treated at the conventional plant.

The Preekstoel WTW was upgraded from 24 Ml/d to 28 Ml/d during the 2011/2012 financial year. A new 10 Ml/day biological WTW for iron and manganese removal was also constructed at the Preekstoel WTW during the 2012/2013 financial year, in order to treat the newly developed groundwater sources and to increase the overall treatment capacity for the Greater Hermanus to 38 Ml/d. Both plants are operated well within the design capacities. The distribution system received Blue Drop awards in 2012 and 2014, which was the last complete assessment done by the DWS. The 2022 Blue Drop Risk Rating for the Greater Hermanus supply system was 20.7% (Low).

The recommendations from the detail Preekstoel WTW Process Audit (December 2021) are indicated in the table below.

Table C.3.9: Recommendations from the Preekstoel WTW Process Audit

Item	Recommendation	Planning Priority
Process Unit Performance Assessment		
Flocculation / Chemical	• Clean off some of the residue that forms on the dosing points.	Long
Settling	• Monitor turbidity values for the individual settling tanks. • Consider moving the inlet to the centre of the distribution box as to establish better flow distribution between the two basins ("old plant")	Long Medium
Filtration	• Control flow to the filters as to ensure they are equally loaded. • Monitor turbidity values for the individual filters. • Perform Specific Deposit determination on filter media (Refer to Chapter B3 of "Handbook for the Operation of Water Treatment Works")	Medium Long Long
Disinfection	• There should be 30 days stock on site. • Having spare chlorine connector lines, "pigtales", on site is always advisable.	Medium Long
Plant Condition Assessment		
Civil Works	• Continue with paintwork. • Perform some general building maintenance. • Consider replacing Bio-Filtration clear-well tiles.	Long Long Long
Mechanical	• Clean off and repair areas where chemical deposits formed. • Ensure routine preventative maintenance is performed.	Medium Medium
Electrical	• Repair exterior MCC's (doors), actuator covers, etc.	Long
Operational Assessment		
Operational Monitoring	• Continue keeping spreadsheet up to date. • Process Controllers to actively use operational data. • Process Controllers to receive regular lab feedback. • Verify the calibration of the equipment use on site. • Include Electrical Conductivity (in mS/m) in the daily testing. • Continue monitoring Aluminium, Iron and Manganese.	Long Medium Medium Medium Short Long
Occupational Health and Safety	• Update signage on site. • Ensure plant personnel are all familiar with how to use the equipment provided. • Test safety showers on a regular basis. • Provide barrier to contain any chemical leaks. • Ideally each Process Controller should have his/her own full-face mask. • Access to the flocculant dosing point needs to be formalized.	Long Long Long Short Long Short
Housekeeping	• Ensure grounds keeping continues. • Ensure mechanical equipment remains clean. • Ensure walkways remain clear (free from flocculant). • Ensure the Bio-Filter overflow weirs (tiled area) is scrubbed on a regular basis.	Long Long Long Long
Maintenance	• Ensure Process Controllers are to be aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site.	Medium Medium
Administrative Assessment		
Water Safety Plan and Incident Management Protocol	• Start sensitizing Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.	Long

Stanford WTW: The newly constructed ultrafiltration and reverse osmosis plant treats water from the spring and the two Kouevlakte boreholes. The Stanford distribution system received a Blue Drop score of 90.94% in 2014, which was the last complete assessment done by the DWS. The 2022 Blue Drop Risk Rating for the Stanford supply system was 17.8% (Low).

The recommendations from the detail Stanford WTW Process Audit (December 2021) are indicated in the table below.

Table C.3.10: Recommendations from the Stanford WTW Process Audit		
Item	**Recommendation**	**Planning Priority**
Process Unit Performance Assessment		
Membranes	• Maintenance of the membranes are crucial. Ensure all schedules are adhere to. • Ensure spare membranes are available, either on site or in storage. • Provide a standby RO feed pump.	Medium Medium Medium
Chemical Dosing	• Ensure maintenance of dosing pumps are scheduled. • Closely monitor residual chlorine levels.	Medium Medium
Plant Condition Assessment		
Civil Works	• N/A	
Mechanical	• Attended to RO feed pump leak as to prevent any further deterioration. • Investigate reason for RO feed pump vibration and repair. • Ensure routine preventative maintenance is performed.	Medium Short Medium
Electrical	• N/A	
Operational Assessment		
Operational Monitoring	• Ensure spreadsheet is being kept up to date. • Process Controllers to actively use operational data. • Process Controllers to receive regular lab feedback. • Verify the calibration of the equipment use on site. • Include Electrical Conductivity in the daily testing. • Include both Sodium and Chlorides in routine testing.	Medium Medium Medium Medium Short Medium
Occupational Health and Safety	• Update signage on site.	Long
Housekeeping	• Tidy up grounds. • Ensure mechanical equipment remains clean.	Long Long
Maintenance	• Ensure Process Controllers are to be aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site.	Medium Medium
Administrative Assessment		
Water Safety Plan and Incident Management Protocol	• Start sensitizing Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.	Long

Franskraal WTW*:* The WTW treats water from the Franskraal and Kraaibosch dams for usage in the Greater Gansbaai area. The WTW was completely rebuilt in 2009 and is currently well equipped and well-operated. The plant operates well within its design capacity under normal conditions. It received two consecutive Blue Drop awards in 2011 and 2012. The Greater Gansbaai distribution system received a Blue Drop score of 88.30% in 2014, which was the last complete assessment done by the DWS. The 2022 Blue Drop Risk Rating for the Greater Gansbaai supply system was 17% (Low).

The recommendations from the detail Franskraal WTW Process Audit (December 2021) are indicated in the table below.

Table C.3.11: Recommendations from the Franskraal WTW Process Audit		
Item	**Recommendation**	**Planning Priority**
Process Unit Performance Assessment		
Flocculation / Chemical	• Connect (electrically) the standby Flocculant Dosing Pump. • Formalise the flocculant dosing point.	Medium Medium
Settling	• Monitor turbidity values for the individual settling tanks. • Provide flow control to the individual settling tank inlets.	Long Medium
Filtration	• Control flow to the filters as to ensure they are equally loaded. • Perform Specific Deposit determination on filter media (Refer to Chapter B3 of "Handbook for the Operation of Water Treatment Works")	Medium Long
Disinfection	• Current stacking practices related to cylinders needs to be addressed. • There should be 30 days stock on site.	Long Medium

Table C.3.11: Recommendations from the Franskraal WTW Process Audit		
Item	**Recommendation**	**Planning Priority**
	• Ideally, every process controller should have his/her own full-face mask. • Repair chlorine scales.	Medium Medium
Plant Condition Assessment		
Civil Works	• Redo paintworks and perform some general building maintenance.	Long
Mechanical	• Clean off and repair areas where chemical deposits formed. • Ensure routine preventative maintenance is performed.	Medium Medium
Electrical	• N/A	
Operational Assessment		
Operational Monitoring	• Ensure spreadsheet is being kept up to date. • Process Controllers to actively use operational data. • Process Controllers to receive regular lab feedback. • Verify the calibration of the equipment use on site. • Include Electrical Conductivity in the daily testing. • Continue monitoring Aluminium and Iron	Medium Medium Medium Medium Short Long
Occupational Health and Safety	• Update signage on site. • Ensure plant personnel are all familiar with how to use the equipment provided. • Test safety showers on a regular basis. • Provide barrier to contain any chemical leaks. • Replace the fence.	Long Long Long Short Long
Housekeeping	• Tidy up grounds. • Ensure mechanical equipment remains clean.	Long Long
Maintenance	• Ensure Process Controllers are to be aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site.	Medium Medium
Administrative Assessment		
Water Safety Plan and Incident Management Protocol	• Start sensitizing Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.	Long

De Kelders WTW: The WTW treats water from the Klipgat fountain and The Grotte fountain for usage in the De Kelders area. This Reverse Osmosis WTW was constructed during 2011 at De Kelders. The recommendations from the detail De Kelders WTW Process Audit (December 2021) are indicated in the table below.

Table C.3.12: Recommendations from the De Kelders WTW Process Audit		
Item	**Recommendation**	**Planning Priority**
Process Unit Performance Assessment		
Membranes	• Maintenance of the membranes are crucial. Ensure all schedules are adhere to. • Ensure spare membranes are available, either on site or in storage.	Medium Medium
Chemical Dosing	• Ensure maintenance of dosing pumps are scheduled. • Provide a containment barrier around the dosing station. • Closely monitor residual chlorine levels.	Medium Short Medium
Plant Condition Assessment		
Civil Works	• Replace storage tank panels where corrosion occurred.	Short
Mechanical	• Repair oil leak on Compressor. • Treat corrosion on chlorine dosing point. • Ensure routine preventative maintenance is performed.	Short Medium Medium
Electrical	• N/A	
Operational Assessment		
Operational Monitoring	• Ensure spreadsheet is being kept up to date. • Process Controllers to actively use operational data. • Process Controllers to receive regular lab feedback. • Verify the calibration of the equipment used on site. • Include Electrical Conductivity in the daily testing. • Include both Sodium and Chlorides in routine testing.	Medium Medium Medium Medium Short Medium
Occupational Health and Safety	• Update signage on site.	Long

Table C.3.12: Recommendations from the De Kelders WTW Process Audit		
Item	**Recommendation**	**Planning Priority**
Housekeeping	• Tidy up site. • Ensure mechanical equipment remains clean.	Long Long
Maintenance	• Ensure Process Controllers are to be aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site.	Medium Medium
Administrative Assessment		
Water Safety Plan and Incident Management Protocol	• Start sensitizing Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.	Long

Pearly Beach WTW: The WTW treats water from the Pearly Beach and Koekemoer dams for usage in Pearly Beach. The Pearly Beach WTW is a new treatment plant and uses state-of-the-art ultrafiltration membrane technology to ensure a high quality final effluent. The plant operates at its design treatment rate, but does not operate for 24 hours per day. It is only operated for approximately 4 – 6 hours per day and therefore does not exceed the rated capacity of the plant. The Pearly Beach distribution system obtained Blue Drop status in 2012 and a Blue Drop score of 87.35% in 2014, which was the last complete assessment done by the DWS. The 2022 Blue Drop Risk Rating for the Pearly Beach supply system was 13.9% (Low).

The recommendations from the detail Pearly Beach WTW Process Audit (December 2021) are indicated in the table below.

Table C.3.13: Recommendations from the Pearly Beach WTW Process Audit		
Item	**Recommendation**	**Planning Priority**
Process Unit Performance Assessment		
Pre-Treatment	• Ensure sludge disposal records are kept.	Medium
Membranes	• Maintenance of the membranes are crucial. Ensure all schedules are adhere to. • Ensure spare membranes are available, either on site or in storage.	Medium Medium
Chemical Dosing	• Ensure maintenance of dosing pumps are scheduled. • A general clean-up of the area is advisable. • Provide a containment barrier around the dosing station. • Closely monitor residual chlorine levels.	Medium Long Short Medium
Plant Condition Assessment		
Civil Works	• Attend to minor repairs (wind damage to doors, etc.) as required.	Long
Mechanical	• Ensure routine preventative maintenance is performed.	Medium
Electrical	• N/A	
Operational Assessment		
Operational Monitoring	• Ensure spreadsheet is being kept up to date. • Process Controllers to actively use operational data. • Process Controllers to receive regular lab feedback. • Verify the calibration of the equipment used on site. • Include Electrical Conductivity in the daily testing. • Continue with Aluminium testing. • Include both Sodium and Chlorides in routine testing.	Medium Medium Medium Medium Short Long Medium
Occupational Health and Safety	• Update signage on site.	Long
Housekeeping	• Tidy up site. • Ensure mechanical equipment remains clean.	Long Long
Maintenance	• Ensure Process Controllers are to be aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site.	Medium Medium
Administrative Assessment		
Water Safety Plan and Incident Management Protocol	• Start sensitizing Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.	Long

Baardskeerdersbos WTW: The WTW treats water from the two boreholes for usage in Baardskeerdersbos. The plant operates well within its design capacity. The Baardskeerdersbos distribution system obtained a Blue Drop score of 63.87% in 2014, which was the last complete assessment done by the DWS. The 2022 Blue Drop Risk Rating for the Baardskeerdersbos supply system was 12.8% (Low).

The recommendations from the detail Baardskeerdersbos WTW Process Audit (December 2021) are indicated in the table below.

Table C.3.14: Recommendations from the Baardskeerdersbos WTW Process Audit

Item	Recommendation	Planning Priority
Process Unit Performance Assessment		
Pre-Treatment	• If manganese removal decreases, determine the concentration of organic compounds in the water. • Automate desludging of the second settler. • Ensure sludge disposal records are kept. • Ensure water quality results from the sludge drainage water are kept on site.	Long Medium Medium Medium
Membranes	• Maintenance of the membranes are crucial. Ensure all schedules are adhere to. • Ensure spare membranes are available, either on site or in storage.	Medium Medium
Chemical Dosing	• Ensure maintenance of dosing pumps are scheduled. • A general clean-up of the area is advisable. • Provide a containment barrier around the dosing station. • Closely monitor residual chlorine levels.	Medium Long Short Medium
Plant Condition Assessment		
Civil Works	• Perform some general building maintenance, specifically externally.	Long
Mechanical	• A general clean-up of chemical residues would be advisable. • Ensure routine preventative maintenance is performed.	Long Medium
Electrical	• N/A	
Operational Assessment		
Operational Monitoring	• Ensure spreadsheet is being kept up to date. • Process Controllers to actively use operational data. • Process Controllers to receive regular lab feedback. • Verify the calibration of the equipment used on site. • Include Electrical Conductivity in the daily testing. • Continue monitoring for Manganese. • Include both Sodium and Chlorides in routine testing.	Medium Medium Medium Medium Short Long Medium
Occupational Health and Safety	• Update signage on site.	Long
Housekeeping	• Tidy up site. • Ensure mechanical equipment remains clean. • Allocate specific storage areas for specific items.	Long Long Long
Maintenance	• Ensure Process Controllers are to be aware of the Preventative Maintenance Schedule. • Ensure records / logbooks pertaining to preventative maintenance are also available on site.	Medium Medium
Administrative Assessment		
Water Safety Plan and Incident Management Protocol	• Start sensitizing Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.	Long

Buffeljags Bay WTW: No water treatment is done, except for disinfection. The distribution system obtained a Blue Drop score of 71.83% in 2014, which was the last complete assessment done by the DWS. The 2022 Blue Drop Risk Rating for the Buffeljags Bay supply system was 16.2% (Low).

The WTWs to be upgraded in Overstrand Municipality are summarised in the table below.

Table C.3.15: WTWs to be Upgraded or New WTWs for the Future

WTW	Short, Medium, Long Term	Estimated Cost (Vat Excluded)
Refurbishment of Buffels River WTW Options 1: *The existing infrastructure is maintained in its current condition with various mitigation measures implemented in-situ.*	*Short*	*R35 000 000*
Refurbishment of Buffels River WTW Option 2: *Urgent work on the existing WTW is done to keep it operational for another 5-years while a new site is sought to procure a new 5.5 Ml/d WTW, thereafter the old WTW would be demolished.*	*Short*	*R33 300 000*
Refurbishment of Buffels River WTW Option 3 (Recommended): The existing WTW site is retained, but it is sequentially rebuilt to a modern WTW and the aspects of the existing infrastructure which is in good condition are retained.	Short	R32 700 000
Refurbishment of the Kleinmond WTW (High Priority)	Short	R1 780 000
Refurbishment of the Kleinmond WTW (Medium Priority)	Medium	R1 650 000
Refurbishment of the Kleinmond WTW (Low Priority)	Medium	R6 350 000
Hermanus 3 Ml/d desalination plant (Phase 1)	Short	R90 000 000
Hermanus 3 Ml/d desalination plant (Phase 2)	Medium	R90 000 000
Hermanus 4 Ml/d desalination plant (Phase 3)	Long	R120 000 000
Buffeljags Bay	Medium	R3 000 000
Total		**R345 480 000**

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

- Buffels River WTW: Visible leaks on the sedimentation tanks. Various concrete areas with exposed aggregate. Structural steel members showed signs of paint delamination and corrosion/rusting at the steel surfaces. The filters could not be used at the time of the site visit and one of the filter valves was broken. Only one ACH dosing pump is available. A number of valves require surface treatment and corrosion protection.

- Kleinmond WTW: The filter backwash pipeline previously had two leaks, which were repaired. Other spots of corrosion were also noticed on the backwash pipeline.

- Preekstoel WTW: Both the Preekstoel WTW and the Bio-filtration plant are well operated and maintained. No faulty equipment were noticed or reported during the site visit.

- Stanford WTW: The ultrafiltration and RO plant is a new plant that was recently constructed and no faulty equipment were noticed or reported during the site visit. There is only one filter feed pump, one wash water pump for filters, one RO feed pump, one recycle pump and one high pressure feed pump (No standby pumps).

- Franskraal WTW: The plant is well operated and maintained. No faulty equipment were noticed or reported during the site visit.

- De Kelders WTW: Blended raw water storage tank was leaking, with signs of corrosion. One of the final water pumps was off site for repairs.

BULK WATER PIPELINE INFRASTRUCTURE

The Water Master Plan (June 2021) has indicated that based on the most likely land-use development scenario, it will be necessary to upgrade the following bulk water supply systems.

- **Buffels River, Greater Hermanus, Greater Gansbaai, Pearly Beach and Baardskeerdersbos:** The existing bulk water supply systems (Bulk pipelines) have insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas.

- **Kleinmond, Stanford, Pearly Beach and Buffeljags Bay:** The existing bulk water supply systems (Bulk pipelines) have sufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas.

Table C.3.16: Future bulk water supply pipelines required

Scheme	New feeder mains that are proposed or existing feeder mains that require upgrading in the future	Year	Distance (m)	Diameter (mm)	Cost (R million)
Buffels River	Abandon existing 150 mm bulk pipeline to Rooi Els and replace with a new 200 dia. pipe (item OBW.B11)	2021	5 029	200	R9.173
	Restrict flow into the sump of the Sunny Seas bulk PS in order to sustain pressure in the upstream Voorberg reservoir zone network, install 14 l/s FCV (item OBW.B8).	2021	-	150	R0.241
	The remaining section of 300 mm dia. bulk pipeline from Buffels River WTP to the Pringle bay draw-off point supplying Pringle Bay and Voorberg reservoirs. (item OBW.B6).	2025	104	400	R0.598
	Subtotal		**5 133**	**-**	**R10.012**
Greater Hermanus	New 500 mm dia. parallel reinforcement of the existing 300 mm dia. bulk supply pipeline to the Mount Pleasant take-off in order to augment supply to the reservoirs on the Hermanus bulk line (item OHW.B24).	2021	665	500	R4.417
	Replace the existing 100 mm dia. bulk supply pipeline to the Mount Pleasant reservoir with a 200 mm dia. pipeline (item OHW.B34).	2021	142	200	R0.300
	New 160 mm dia. connection pipe from the main pipelines downstream of the Preekstoel WTP to the Sandbaai and Mount Pleasant reservoirs as an alternative supply (items OHW.B41 & OHW.B42).	2021	160	160	R0.260
		2021	265	160	R0.407
	Connect existing Gateway pipeline to existing 600 mm dia. Hermanus bulk pipeline (alternative option in order to supply bulk water to Sandbaai reservoir) (item OHW.B40).	2021	4	160	R0.041
	New 315 mm dia. parallel reinforcement of the existing 150 mm dia. bulk supply pipeline to the Hawston LL reservoir in order to augment supply to the reservoir (item OHW.B20).	2022	296	315	R0.450
	New 250 mm dia. parallel reinforcement of the existing 150 mm dia. bulk supply pipeline to the Sandbaai reservoir in order to augment supply to the reservoir (item OHW.B14).	2022	193	250	R0.522
	New 200 mm dia. parallel reinforcement of the existing 160 mm dia. bulk supply pipeline to the Onrus reservoir in order to augment supply to the reservoir (item OHW.B28).	2024	236	200	R0.472
	Install inter-connection pipe between 200 mm dia. bulk and 200 mm dia. network pipe as part of bulk system (after item OHW1.1 is implemented) (item OHW.B22c).	2025	1	200	R0.024
	Insert and close valve between network and bulk system (after item OHW1.1 is implemented) (item OHW.B22d).	2025	-	200	R0.121
	It is proposed that the existing 200 mm dia. supply pipeline from the Fisherhaven LL reservoir to the existing network is replaced with a new 315 mm dia. pipe (item OHW1.1) in order to transfer the existing 200 mm dia. network pipe to the existing bulk system (Items OHW.B22a & OHW.B22b). This will improve bulk supply from the Coastal bulk system to Fisherhaven LL reservoir.	2025	19	200	R1.078
		2025	-	200	R0.121
	New 400 mm dia. parallel reinforcement of the existing 400 mm dia. bulk supply pipeline when the 400 mm dia. pipe reaches capacity (item OHW.B25).	2030	1 387	400	R7.214
	New 315 mm dia. parallel reinforcement of the existing 250 mm dia. Vermont to Hawston bulk pipeline when the existing 250 mm dia. bulk pipe reaches capacity (item OHW.B19).	2035	3 329	355	R13.682
	New 500 mm dia. parallel reinforcement of the existing 400 & 600 mm dia. bulk pipelines (from the Preekstoel WTP to the Coastal & Hermanus bulk pipelines) when the existing 400 & 600 mm dia. bulk pipes from the Preekstoel WTP reaches capacity (item OHW.B23).	2040	472	500	R3.179
	New 355 mm dia. bulk supply pipeline from the Fisherhaven HL reservoir to the existing bulk water infrastructure at the Hawston reservoir (item OHW.B35).	2040	2 611	355	R10.746

Table C.3.16: Future bulk water supply pipelines required					
Scheme	**New feeder mains that are proposed or existing feeder mains that require upgrading in the future**	**Year**	**Distance (m)**	**Diameter (mm)**	**Cost (R million)**
	Install pipeline when Overberg pipeline is constructed, to feed Fisherhaven LL from HL reservoir (item OHW.B37).	2040	39	200	R0.114
	Insert and close valve when Overberg pipeline is constructed, to feed Fisherhaven LL from HL reservoir (item OHW.B38).	2040	-	200	R0.121
	Install Flow Control Valve (41 l/s) when Overberg pipeline is constructed, to feed Fisherhaven LL from HL reservoir (item OHW.B39).	2040	-	200	R0.279
	Install Flow Control Valve (67 l/s) to transfer bulk water from Fisherhaven HL reservoir to the Hawston reservoir (item OHW.B43).	2040	-	400	R1.420
	Subtotal		**9 961**	**-**	**R44.968**
Greater Gansbaai	Dedicate the existing 250 mm dia. pipeline between the Greater Gansbaai bulk system and the De Kelders reservoirs as 'n bulk supply pipeline to the De Kelders reservoirs (item OGW.B24).	2030	59	250	R0.150
	New 600 dia. mm bulk supply pipeline from the Franskraal WTP clearwell reservoir to the main Franskraal bulk PS (item OGW.B9).	2030	42	600	R1.240
	Reinforce existing Franskraal WTP raw water supply (item OGW.B23	2030	203	500	R1.454
	New 500 mm dia. bulk supply pipeline from the main Franskraal bulk PS to the existing 355 mm dia. and future 400 mm dia. pipeline bulk pipes to Kleinbaai, Gansbaai and De Kelders (item OGW.B19).	2030	205	500	R1.466
	Replace the existing 200 mm dia. bulk pipeline with a 400 mm dia. pipeline when the existing 200 and 355 mm dia. bulk pipes reaches capacity (items OGW.B2 & B3).	2035	715	400	R1.246
		2035	2 169	400	R3.714
	New 315 mm dia. bulk supply pipeline from the main Franskraal bulk PS to the proposed Franskraal HL reservoir (item OGW.B16).	2040	864	315	R2.653
	New 355 mm dia. dedicated bulk supply pipeline from the main Franskraal bulk PS to the existing Franskraal LL reservoirs (item OGW.B21).	2040	182	355	R0.816
	Subtotal		**4 439**	**-**	**R12.739**
Baardskeerdersbos	A new dedicated bulk pipeline is proposed when master plan item OBBW.B2 (new reservoir) is implemented.	2030	939	110	R0.987
	Subtotal		**939**	**-**	**R0.987**
Overberg Water	*New bulk supply pipeline to Hermanus (item RVW5.1)*	*2035*	*7 229*	*450*	*R46.543*
	New bulk supply pipeline to Hermanus (item RVW5.4)	*2035*	*34 547*	*450*	*R221.861*
	Subtotal		***41 776***	**-**	***R268.404***
Total (Excluding Overberg Water)			**20 472**	**-**	**R68.706**

WATER PUMP STATIONS

The water pump stations are well maintained and all the motors and pumps are operational. Key issues to be addressed at the water pump stations, as identified through the WSDP inspection process, are as follows:

- Kleinmond fountain raw water PS: Only one motor and pump. The motor is currently not working.
- Palmiet raw water PS: The seal of one of the pumps is leaking.
- De Grotte raw water PS: Only one motor and pump.

The Water Master Plan (June 2021) has indicated that based on the most likely land-use development scenario, it will be necessary for the following water pump stations:

Table C.3.17: Future Water Pump Stations Required					
Scheme	**Recommendations included in the Water Master Plan**	**Year**	**Capacity (l/s)**	**Head (m)**	**Cost (R Million)**
Buffels River	A new booster pump station is proposed on the 300 mm Ø Betty's Bay Voorberg reservoir supply pipeline in order to augment bulk water supply to Betty's Bay in the future (item OBW.B7).	2025	75	12	R2.729
	A new booster pump station for the higher lying areas in the Voorberg reservoir zone is proposed (item OBW.B4).	2030	10	25	R1.781
	Subtotal				**R4.510**
Greater Hermanus	A new booster pump station to augment water supply through the Coastal bulk pipeline (item OHW.B17) to Hawston and Fisherhaven.	2022	90	20	R3.037
	Upgrading of the existing bulk pump station to augment bulk water supply from the Fisherhaven LL to the Fisherhaven HL reservoir is proposed for when future areas GH1, GH5,1 & GH50 develop (item OHW.B3).	2025	40	70	R0.626
	Subtotal				**R3.663**

Table C.3.17: Future Water Pump Stations Required					
Scheme	**Recommendations included in the Water Master Plan**	**Year**	**Capacity (l/s)**	**Head (m)**	**Cost (R Million)**
Greater Gansbaai	New booster pump station when future area GG30 develops (item OGW5.1).	2021	30	20	-
	New booster pump station to supply sufficient water pressure Masakhane informal area (Item OGW7.1)	2025	30	15	R2.069
	New bulk pump station to supply water from the Gansbaai reservoirs to the De Kelder reservoirs (item OGW.B7).	2030	45	60	R2.545
	New dedicated bulk PS to Kleinbaai & Gansbaai when existing bulk supply reaches capacity (item OGW.B18).	2030	220	35	R5.500
	Dedicated PS to Franskraal reservoirs when existing bulk PS reaches capacity (item OGW.B20).	2040	130	5	R3.440
	New dedicated pump station from the Franskraal clearwater reservoir to the proposed Franskraal HL reservoir (item OGW.B15).	2040	60	65	R2.883
	Subtotal				**R16.437**
Pearly Beach	Upgrading of the existing Pearly Beach pump system (item OPW.B3).	2035	75	45	R0.693
	Subtotal				**R0.693**
Baardskeerdersbos	Pump station to augment bulk supply to Baardskeerdersbos reservoir (item OBBW.B3)	2060	6	100	**R1.765**
	Subtotal				**R1.765**
Overberg Water	*Pump station for new bulk supply to Hermanus (item RVW5.3)*	*2035*	*250*	*250*	*R11.367*
	Subtotal				***R11.367***
Total (Excluding Overberg Water)					**R27.068**

RESERVOIR INFRASTRUCTURE

The condition of most of the reservoirs in Overstrand Municipality's Management Area is good and the reservoirs are well maintained. New security fences were also recently installed at some of the reservoir sites to reduce possible vandalism. Key issues to be addressed at the reservoirs, as identified through the WSDP inspection process, are as follows:

- Voorberg 1.800 Ml reservoir: Reservoir covers are not locked and reservoir site is not fenced. Chamber for Bermad Control Valve still to be constructed.
- Pringle Bay Reservoirs: The reservoirs are fenced and locked. Chamber for outlet meter very small with limited access and no step irons. Reservoir cover of old Pringle Bay reservoir is not locked. Constant running of water from drainage pipe of new reservoir to be monitored.
- Kleinmond reservoirs: Covers not locked. Raw water storage reservoir for fountain water is leaking.
- Hawston reservoir: Control valve was vandalised and is leaking and in a poor condition.
- Vermont reservoirs: One of the reservoir covers is open, not locked.
- Onrus reservoir: Reservoir site is fenced and locked. One of the reservoir covers is open, not locked.
- Mount Pleasant reservoirs: Reservoirs site is fenced and locked. Covers are not locked.
- Hermanus reservoirs: Reservoir site is fenced and locked. One of the covers is not locked.
- Northcliff reservoir: Reservoir site is fenced and locked. Reservoir cover is not locked. Outlet control valves are corroded and in a poor condition.
- Hermanus Heights LL reservoirs. Reservoirs site is fenced and locked. Outlet control valves are corroded and in a poor condition.
- Stanford reservoirs: Reservoirs site is fenced and locked. One of the reservoir covers is not locked.
- Gansbaai reservoirs: Reservoirs site is fenced and locked. Cover of one of the reservoirs is not locked.

Overstrand Municipality's overall storage factors of the reservoirs for the various schemes for 2020/2021, based on 1 x PDD (24 hours storage capacity), are 1.57 for Buffels River, 2.04 for Kleinmond, 1.83 for Greater Hermanus, 1.37 for Stanford, 2.14 for Greater Gansbaai, 2.33 for Pearly Beach, 1.60 for Baardskeerdersbos and 3.20 for Buffeljags Bay.

Even though the town's overall storage capacity might be adequate there might be some distribution zones within the town's network with inadequate storage capacity, as identified through the Water Master Planning process (June 2021) and indicated in the table below.

Table C.3.18: Future Reservoir Storage Capacities Required

Area	Recommendations included in the Water Master Plan	Year	Capacity (Ml)	Cost (R Million)
Buffels River	A new 3.0 Ml reservoir is proposed at the existing Voorberg reservoir site to augment reservoir storage for Betty's Bay (item OBW.B3).	2025	3.000	R10.962
	A new 1.0 Ml reservoir is proposed at the existing Sunny Seas reservoir site to augment reservoir storage for Betty's Bay (item OBW.B9).	2030	1.000	R5.220
	A new 1.5 Ml reservoir is proposed at the existing Pringle Bay reservoir site to augment reservoir storage for Pringle Bay (item OBW.B2).	2050	1.500	R6.888
	Subtotal			**R23.070**
Greater Hermanus	A new 3.0 Ml reservoir is proposed at the existing Sandbaai reservoir site to augment reservoir storage in Sandbaai (item OHW.B11).	2022	3.000	R10.962
	A new 1.5 Ml reservoir is proposed at the existing Onrus reservoir site to augment reservoir storage in Onrus (item OHW.B9).	2024	1.500	R6.888
	12.0 Ml reservoir storage is proposed at the existing Fisherhaven HL reservoir site to augment reservoir storage for the Fisherhaven HL reservoir zone. It is proposed that this is phased in 2 x 6 Ml reservoirs (item OHW.B30a).	2030	6.000	R18.009
	A new 3.5 Ml reservoir is proposed at the existing Hawston LL reservoir site to augment reservoir storage in Hawston (item OHW.B2).	2030	3.500	R12.345
	A new 1.0 Ml reservoir is proposed at the existing Vermont reservoir site to augment reservoir storage for the Vermont reservoir zone (item OHW.B36).	2030	1.000	R5.220
	A new 0.5 Ml reservoir is proposed at the existing Chanteclair reservoir site to augment reservoir storage in the Onrus Manor reservoir zone (item OHW.B27).	2030	0.500	R3.321
	A new 2.0 Ml reservoir is proposed at the existing Hermanus 1 & 2 reservoir site to augment reservoir storage for the zone when the AADD for the Hermanus reservoir zone exceeds 5 000 kl/d (item OHW.B32).	2030	2.000	R8.294
	A new 2.0 Ml reservoir is proposed at the existing Fisherhaven LL reservoir site to augment reservoir storage for the Fisherhaven LL reservoir zone (item OHW.B1).	2035	2.000	R8.294
	A new 0.25 Ml reservoir is proposed at the existing Northcliff reservoir site to augment reservoir storage in the Northcliff reservoir zone (item OHW.B12).	2035	0.250	R2.001
	12.0 Ml reservoir storage is proposed at the existing Fisherhaven HL reservoir site to augment reservoir storage for the Fisherhaven HL reservoir zone. It is proposed that this is phased in 2 x 6 Ml reservoirs (item OHW.B30b).	2045	6.000	R18.009
	Subtotal			**R93.343**
Stanford	A new 3.0 Ml reservoir is proposed at the existing Stanford reservoir site to augment reservoir storage for Stanford when the AADD for the town exceeds 1 350 kl/d (item OSW.B1).	2030	3.000	R10.962
	Subtotal			**R10.962**
Greater Gansbaai	A new 4.0 Ml reservoir (item OGW.B10) is proposed at the existing Franskraal reservoir site to augment reservoir storage for Franskraal.	2030	4.000	R13.601
	A new 3.5 Ml reservoir (item OGW.B11) is proposed at the existing Kleinbaai reservoir site to augment reservoir storage for Kleinbaai, Romans Bay and the Birkenhead area.	2035	3.500	R12.345
	A second 4.0 Ml reservoir (item OGW.B22) is proposed at the existing Gansbaai reservoir site to augment reservoir storage for the future.	2035	4.000	R13.601
	A new 1.5 Ml reservoir (item OGW.B13) is proposed at the existing De Kelders reservoir site to augment reservoir storage for De Kelders.	2035	1.500	R6.888
	A new 5.5 ML reservoir (item OGW.B17) is proposed to accommodate future development area GG32 and the higher lying erven of future development area GG33.	2040	5.500	R16.907
	A new 4.5 Ml (item OGW.B14) is proposed at the existing Franskraal reservoir site to augment reservoir storage for Franskraal. The reservoir will only be required when future development area GG31 & the lower lying erven of future development area GG33 start to develop.	2050	4.500	R14.731
	Subtotal			**R78.073**
Pearly Beach	A new 1.5 Ml reservoir is proposed at the existing Pearly Beach reservoir site to augment reservoir storage for Pearly Beach when the AADD reaches 1 000 kl/d (item OPW.B2).	2035	1.500	R6.888
	Subtotal			**R6.888**
Baardskeerdersbos	A new 0.150 Ml tank is proposed to augment reservoir storage capacity for Baardskeerdersbos when the AADD exceeds 75 kl/d (item OBBW.B2)	2050	0.150	R1.201
	Subtotal			**R1.201**
Overberg Water	*To augment balancing volume of Ruensveld West WTW (Item RVW1.8)*	*2035*	*5.500*	*R16.907*
	Balancing volume for supply to Hermanus (item RVW5.2)	*2035*	*10.000*	*R26.390*

Table C.3.18: Future Reservoir Storage Capacities Required				
Area	**Recommendations included in the Water Master Plan**	**Year**	**Capacity (Ml)**	**Cost (R Million)**
	Balancing volume for supply to Hermanus (item RVW5.5)	*2035*	*20.000*	*R45.530*
	Subtotal			***R88.827***
Total (Excluding Overberg Water)				**R213.537**

WATER RETICULATION INFRASTRUCTURE

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

Table C.3.19: Future Water Reticulation Infrastructure Required					
Scheme	**Year**	**Recommendations included in the Water Master Plan**	**Distance (m)**	**Diameter (mm)**	**Cost (R Million)**
Buffels River	2021	Upgrade existing 75 and 100 mm pipelines (Item OBW5.1)	91	200	R0.114
		New dedicated feeder main for high lying erven (Items OBW5.2 and OBW5.3)	109	200	R0.242
			363	110	R0.398
	2025	Replace existing 75 mm to improve network conveyance (Item OBW1.1)	330	200	R0.310
		Replace existing 50 mm to improve network conveyance (to be verified, potentially already upgraded) (Item OBW1.2)	691	160	R0.486
		Replace existing 50 mm to improve network conveyance (Item OBW1.3)	428	110	R0.310
		Replace existing 75 mm and connect to Disa Kloof 160 mm pipeline to improve network conveyance (including main road crossing) (Item OBW4.3)	292	160	R1.625
	2030	Replace existing 75 and 100 mm pipelines to improve network conveyance (Item OBW4.1)	57	160	R0.079
		Replace existing 75 mm to improve network conveyance (Item OBW7.3)	177	160	R0.178
		Required to augment supply to Sunny Seas reservoir when supply problems occur (Item OBW2.2)	602	200	R1.136
		Required to rezone network when Betty's Bay booster zone is implemented (Item OBW2.3)	1 887	200	R3.469
		Replace existing 75 mm to improve network conveyance when Voorberg booster zone is implemented (Item OBW3.1)	155	110	R0.151
		Inter-connection pipe to improve network redundancy (including main road crossing) (Item OBW3.2)	17	110	R0.042
		Required to rezone network, check valve to install (Item OBW3.3)	-	100	0.140
		Required to rezone network, valve to insert and close (Item OBW3.4a)	-	75	0.102
		Required to rezone network, valve to insert and close (Item OBW3.4b)	-	160	0.114
		Required to rezone network, check valve to install (Item OBW3.5)	-	150	0.151
	2040	To improve network conveyance (Item OBW2.1)	1 736	315	R5.273
	Subtotal		**6 935**	**-**	**R14.320**
Kleinmond	2021	Required soon for pressure requirements (Item OKW1.2)	502	315	R1.564
		To improve network conveyance (Item OKW1.9)	7	160	R0.044
		To improve network conveyance (Item OKW1.10)	4	160	R0.040
		75 mm and 100 mm valves to close and 160 mm valve to open	-	-	-
	2025	To improve network conveyance (Item OKW1.8)	863	200	R1.609
	2035	Replace existing 50 mm required when future areas KM3 and KM4 develop (Item OKW1.6)	356	200	R0.262
		Required when future areas KM3 and KM4 develop (Item OKW1.7)	369	200	R0.713
		Replace existing 75 mm with 200 mm when future area KM20 develops (Item OKW1.11)	750	200	R0.672
		Required when future area KM16 develops (Item OKW1.12)	452	160	R0.669
	Subtotal		**3 303**	**-**	**R5.573**
Greater Hermanus	2021	Replace existing 75mm pipes and reinforce network when future areas GH32 and GH33 develop (Item OHW8.3)	277	160	R0.316
		To improve network redundancy (Item OHW8.4)	80	110	R0.108
		Replace existing 225 mm to improve network conveyance (Item OHW9.2)	111	315	R0.323
	2022	Required to rezone network, valve to insert and close (Item OHW10.1b)	-	75	R0.102
		Required to rezone network, open and close various valves (Items OHW10.1a, OHW10.2a-c, OHW10.3a-d)	-	-	-
		To improve network conveyance (Item OHW10.4)	185	110	R0.176
		To improve network conveyance (with implementation of item OHWB.20) (Item OHW2.1)	313	400	R1.705

Table C.3.19: Future Water Reticulation Infrastructure Required					
Scheme	**Year**	**Recommendations included in the Water Master Plan**	**Distance (m)**	**Diameter (mm)**	**Cost (R Million)**
	2023	Inter-connection pipe to improve network redundancy (Item OHW9.5)	105	110	R0.134
		Replace existing 75 mm to improve network conveyance (Item OHW9.9)	572	160	R0.519
		To improve network conveyance (Item OHW9.12)	324	160	R0.489
		To improve network conveyance (Item OHW9.13)	117	110	R0.145
		Required to improve network conveyance (Item OHW9.14)	1 534	400	R7.968
		To improve network conveyance (Item OHW9.15)	92	160	R0.112
		To improve network conveyance (Item OHW9.16)	25	110	R0.052
	2024	Required when Zwelihle informal area is formalized (Item OHW9.3)	431	200	R0.826
		Required when Zwelihle informal area is formalized (Item OHW9.6)	621	160	R0.834
		Required when Zwelihle informal area is formalized (Item OHW9.10)	449	160	R0.613
		Required to improve network conveyance (Item OHW9.11)	591	160	R0.864
	2025	Required when future area GH5.2 develops (Item OHW2.3)	610	200	R1.150
		Replace existing 50 mm to improve network conveyance when GH6.2 and GH6.6 develops (Item OHW2.6)	580	110	R0.412
		To improve network conveyance when future area GH5.1 develops (Item OHW13.1)	466	355	R1.807
		To improve network conveyance (Item OHW5.1)	80	75	R0.095
		Required when future area GH28.1 develops (Item OHW7.4)	212	110	R0.177
		New supply pipe from reservoir to network (when AADD of Fisherhaven LL reaches 1 000 kl/d) (Item OHW1.1)	976	315	R4.280
		To improve network conveyance (including main road crossing) (Item OHW6.1)	432	200	R0.827
		Required for even withdrawal from existing network, flow control valve to install (Item OHW14.1)	-	75	R0.182
		Fernkloof tank internal water network (Item OHW14.2)	200	110	R0.230
	2030	Replace existing 50 mm required to improve network conveyance (Item OHW1.5)	492	110	R0.382
		Replace existing 75 mm required to improve network conveyance (Item OHW1.6)	623	110	R0.563
		Replace existing 150 mm Ø to improve network conveyance (Item OHW2.2)	287	315	R0.437
		Replace existing 150 mm Ø to improve network conveyance (Item OHW2.4)	252	315	R0.389
		Required to manage static pressures in zone, install PRV (Item OHW3.6)	-	110	R0.241
		Required when future area GH5.1 develops (Item OHW13.2)	397	355	R1.550
		Required when future area GH5.1 develops (Item OHW13.3)	1 391	315	R4.236
		Required when future area GH5.1 develops (Item OHW13.4)	623	250	R1.844
		Required when future area GH5.1 develops (Item OHW13.5)	1 905	160	R2.531
		Required when future areas GH6.3, GH6.4 & GH6.5 develop (including main road crossing) (Item OHW13.8)	1 052	250	R2.606
		Required when future area GH11 develops (Item OHW7.6)	522	160	R0.767
	2035	Replace existing 50 and 75 mm to improve network redundancy when future area GH2 develops (Item OHW1.2)	650	160	R0.467
		Required when future area GH2 develops (Item OHW1.3)	932	160	R1.343
		Required when future area GH6.6 develops (Item OHW2.10)	590	110	R0.593
		Replace existing 50 mm required to improve network conveyance (Item OHW2.11)	1 224	250	R0.867
		Required when future area GH6.4 develops (Item OHW3.8)	325	200	R0.582
		Required when future area GH6.1 develops (Item OHW5.2)	378	160	R0.566
		To improve network conveyance (Item OHW12.1)	473	200	R0.902
	2040	Required when future area GH3 develops (Item OHW1.4)	148	250	R0.414
		To improve network redundancy (Item OHW12.2)	194	110	R0.225
	2045	Replace existing 100 mm required to improve network conveyance (Item OHW2.5)	423	315	R0.575
		Required when future areas GH1 & GH50 develop (Item OHW13.12)	152	400	R0.880
	2050	Required when future area GH1 develops (Item OHW13.13)	285	315	R0.997
	Subtotal		**22 701**	**-**	**R48.403**
Stanford	2021	To improve network conveyance (when future area SF7 develops) (Item OSW1.6)	614	250	R1.455
		Replace existing 100 mm pipeline to improve network conveyance (Item OSW2.5)	264	200	R0.296
		Replace existing 50 and 75 mm pipelines to improve network conveyance (Item OSW2.8)	261	160	R0.235

Table C.3.19: Future Water Reticulation Infrastructure Required					
Scheme	**Year**	**Recommendations included in the Water Master Plan**	**Distance (m)**	**Diameter (mm)**	**Cost (R Million)**
		Required for isolating of Stanford PRV and reservoir zones, close valves (Items OSW2.9a and OSW2.9b)	-	110	-
		Replace existing 50 and 75 mm pipelines and connect lower lying erven of LCH area to PRV zone (Item OSW2.10)	110	160	R0.111
	2020	Required for isolating of Stanford PRV and reservoir zones, install PRV (Item OSW2.2)	-	110	R0.241
	2025	To improve network redundancy (Item OSW1.8)	100	110	R0.129
		Replace existing 50 mm to improve network conveyance (Item OSW2.6)	564	110	R0.401
	2030	Required when future areas SF1, SF3, SF4 and SF5 develop (Item OSW1.3)	1 147	200	R2.126
	2035	Required when future areas SF1, SF3 and SF4 develop (Item OSW1.4)	374	200	R0.722
	Subtotal		**3 434**	**-**	**R5.716**
Greater Gansbaai	2021	Replace existing 50 mm to improve network conveyance (Item OGW1.3)	76	110	R0.074
		To improve network redundancy (Item OGW1.6)	119	75	R0.129
		To improve network redundancy (OGW1.8)	296	110	R0.329
	2023	To improve network conveyance (Item OGW2.1)	1 006	450	R5.407
		To improve network conveyance (Item OGW2.2)	200	355	R0.818
		To improve network conveyance (Item OGW2.16)	155	160	R0.252
		To improve network conveyance (Item OGW2.17)	52	160	R0.108
	2024	To improve network conveyance (Item OGW2.3)	398	200	R0.765
	2025	To improve network conveyance (Item OGW3.1a)	83	315	R0.236
		To improve network conveyance (Item OGW3.4)	134	110	R0.164
		Required when future areas GG25 and GG34 develop (Item OGW3.10)	733	110	R0.721
		Required when future area GG34 develops (Item OGW3.12)	1 405	110	R1.357
		To improve network conveyance (Item OGW7.2)	139	200	R0.295
		To isolate booster zone from reservoir zone, insert two 75 mm valves and close (Items OGW7.3 and OGW7.4)	-	75	R0.204
		Required when future area GG8.2 develops (Item OGW2.13)	399	160	R0.595
		To improve network conveyance and redundancy (Item OGW2.14)	703	160	R1.021
	2030	Required when future area GG2 develops (Item OGW1.5)	94	160	R0.166
		To improve network conveyance (Item OGW2.8a)	332	200	R0.646
		Replace existing 50 mm to improve network conveyance (Item OGW2.8b)	486	200	R0.349
		To improve network conveyance (Item OGW2.9)	612	160	R0.894
		To improve network conveyance (Item OGW3.1b)	601	200	R1.379
		Required when future areas GG12, 16, 17 and 18 develop (Item OGW3.2)	1 308	200	R2.417
		To improve network conveyance (Item OGW4.1)	204	160	R0.320
	2035	Required when future area GG1 develops (Item OGW1.2)	782	200	R1.463
		Replace existing 75 mm when future area GG28 develops (Item OGW1.12)	238	110	R0.202
		Required when future areas GG16, 17 and 18 develop (Item OGW3.3)	1 105	160	R1.585
	2040	Required when future area GG1 develops (Item OGW1.13)	1 022	160	R1.470
		Required when future area GG10.2 develops (Item OGW2.18)	512	160	R0.753
		Required when future area GG31 and lower lying erven of GG33 develops (Item OGW4.3)	801	550	R5.995
		Inter-connection pipe to improve network conveyance when MP item OGW4.3 is constructed (Item OGW4.4)	20	355	R0.149
		Required when lower lying erven of future area GG33 develops (Item OGW4.8)	1 762	315	R5.352
		New supply pipe when Franskraal HL reservoir is constructed (Item OGW6.1)	572	400	R2.771
		Required when higher lying erven of future area GG33 develops (Item OGW6.4)	1 043	400	R4.973
		Required when higher lying erven of future area GG33 develops (Item OGW6.5)	814	315	R2.501
	2045	Required when future area GG25 develops (Item OGW3.6)	640	110	R0.632
		Required when future area GG25 develops (Item OGW3.7)	1 347	110	R1.301
		Required when future area GG25 develops (Item OGW3.8)	1 120	110	R1.087
		Required when future area GG25 develops (Item OGW3.9)	1 517	110	R1.463
		To improve network conveyance (Item OGW4.2)	1 171	160	R1.679
		Required when future area GG31 develops (Item OGW4.5)	1 176	315	R3.589
		Required when lower lying erven of future area GG33 develops (Item OGW4.9)	771	250	R1.759

Table C.3.19: Future Water Reticulation Infrastructure Required					
Scheme	**Year**	**Recommendations included in the Water Master Plan**	**Distance (m)**	**Diameter (mm)**	**Cost (R Million)**
		Required when lower lying erven of future area GG33 develops (Item OGW4.10)	597	200	R1.033
		Required when lower lying erven of future area GG33 develops (Item OGW6.6)	1 008	250	R2.283
	2050	Required when future area GG31 develops (Item OGW4.6)	1 613	250	R3.620
	2055	Required when future area GG31 develops (Item OGW4.7)	805	200	R1.377
	Subtotal		**29 971**	**-**	**R65.683**
Pearly Beach	2035	To improve network conveyance when capacity of the booster PS is upgraded (Item OPW1.4)	595	250	R1.497
	2040	Required when future area PB4 develops (Item OPW1.3)	817	110	R0.808
	Subtotal		**1 412**	**-**	**R2.305**
Baardskeer-dersbos	2030	Dedicated bulk water supply to Baardskeerdersbos reservoir, valve to insert and close (Item OBBW1.1)	-	90	R0.102
	Subtotal		**-**	**-**	**R0.102**
Total			**67 756**		**R142.102**

The Water Master Plan (June 2021) indicated the following Water Demand Management infrastructure requirements.

Table C.3.20: Future Water Demand Management Infrastructure Required			
Scheme	**Year**	**Project**	**Cost (R Million)**
Buffels River	-	Telemetry at reservoirs, pumping stations and bulk water meters	R0.200
Kleinmond	-	Telemetry at reservoirs, pumping stations and bulk water meters	R0.050
Greater Hermanus	-	Telemetry at reservoirs, pumping stations and bulk water meters	R0.700
Stanford	-	Telemetry at reservoirs, pumping stations and bulk water meters	R0.100
Greater Gansbaai	2022	Various pipelines and valves, PRJ-OGW002	R5.287
	2035	Various valves, PRJ-OGW016	R0.198
	-	Telemetry at reservoirs, pumping stations and bulk water meters	R0.500
Pearly Beach	-	Telemetry at reservoirs, pumping stations and bulk water meters	R0.100
Baardskeerdersbos	-	Telemetry at reservoirs, pumping stations and bulk water meters	R0.100
Buffeljags Bay	-	Telemetry at reservoirs, pumping stations and bulk water meters	R0.050
Total			**R7.285**

BULK SEWER PIPELINE AND SEWER DRAINAGE NETWORK INFRASTRUCTURE

The waterborne sewerage drainage networks need to be extended in Kleinmond, Greater Gansbaai, Greater Hermanus, Hawston and Pearly Beach, while the entire towns of Betty's Bay, Pringle Bay, Rooi-Els, Baardskeerdersbos and Buffeljags Bay are still dependent on the sewerage tanker truck service. Some of the bulk sewer rising main pipelines need to be refurbished.

The Sewer Master Plan (June 2021) has indicated that based on the most likely land-use development scenario, it will be necessary for the following bulk sewer pipeline and sewer drainage network infrastructure.

Table C.3.21: Future Bulk Sewer Pipeline and Sewer Drainage Network Infrastructure Required			
Scheme	**Year**	**Project**	**Cost (R Million)**
Buffels River	2030	New outfall sewer for unserviced erven in Betty's Bay (Item OBS8.1 – OBS15.1)	R148.905
		New rising main when Betty's Bay Main pump station no. 1 is constructed (Item OBS.B6)	R21.895
		New rising main when Betty's Bay Main pump station no. 2 is constructed (Item OBS.B8)	R12.137
		New rising main when Betty's Bay Main pump station no. 3 is constructed (Item OBS.B10)	R17.641
		New rising main when future Betty's Bay pump station 1 is constructed (Item OBS8.3)	R0.383
		New rising main when future Betty's Bay pump station 2 is constructed (Item OBS9.6)	R2.362
		New rising main when future Betty's Bay pump station 3 is constructed (Item OBS10.4)	R0.882
		New rising main when future Betty's Bay pump station 4 is constructed (Item OBS11.3)	R0.455
		New rising main when future Betty's Bay pump station 5 is constructed (Item OBS12.3)	R0.343

Table C.3.21: Future Bulk Sewer Pipeline and Sewer Drainage Network Infrastructure Required			
Scheme	**Year**	**Project**	**Cost (R Million)**
		New rising main when future Betty's Bay pump station 6 is constructed (Item OBS13.3)	R0.565
		New rising main when future Betty's Bay pump station 7 is constructed (Item OBS14.5)	R0.763
		New rising main when future Betty's Bay pump station 8 is constructed (Item OBS15.3)	R0.102
	2035	New gravity outfall sewers for unserviced erven in Pringle Bay (Items OBS5.1, OBS5.2, OBS6.1, OBS6.2 and OBS7.1))	R69.134
		New rising main when future Pringle Bay pump station 1 is constructed (Item OBS5.4)	R2.556
		New rising main when future Pringle Bay pump station 2 is constructed (Item OBS6.4)	R0.939
		New rising main when future Pringle Bay pump station 3 is constructed (Item OBS7.3)	R0.773
		New rising main when future Rooi Els pump station 1 is constructed (Item OBS1.3)	R0.310
		New rising main when future Rooi Els pump station 2 is constructed (Item OBS2.4)	R0.522
		New rising main when future Rooi Els pump station 3 is constructed (Item OBS3.6)	R0.282
		New rising main when future Rooi Els pump station 4 is constructed (Item OBS4.3)	R0.331
		New rising main when Pringle Bay Main pump station is constructed (Item OBS.B4)	R10.664
	2040	New gravity outfall sewers for unserviced erven in Rooi Els (Item OBS1.1, OBS2.1, OBS2.2, OBS3.1, OBS3.2, OBS3.3, OBS3.4 and OBS4.1)	R20.013
		New rising main when Rooi Els Main pump station is constructed (Item OBS.B2)	R7.105
	Subtotal		**R319.062**
Kleinmond	2020	New gravity outfall sewer for unserviced erven in Kleinmond (Item OKS2.1)	R39.146
	2023	Upgrade existing 160 mm dia. outfall gravity sewer when it reaches capacity (Investigate first) (Item OKS2.4)	R1.289
	2025	New gravity outfall sewer for unserviced erven in Kleinmond (Item OKS1.1)	R20.639
		New gravity outfall sewer for future development area KM9 (Item OKS2.6)	R0.501
		Upgrade existing 100 mm dia. gravity sewer when it reaches capacity (Item OKS5.1)	R0.742
	2030	New gravity sewer required when future area KM3 develops (Item OKS2.3)	R0.577
	2035	Upgrade existing rising main when Kleinmond PS5 is upgraded (Item OKS6.2)	R0.565
		Upgrade existing gravity sewer when future area KM20 develops (Item OKS6.3)	R0.904
	Subtotal		**R64.363**
Greater Hermanus	2021	Upgrade existing rising main. Verify diameter of rising main (Item OHS22.2)	-
		Upgrade existing 225 mm dia. outfall gravity sewer when it reaches capacity (Item OHS13.1)	R2.507
		Upgrade existing 450 & 525 mm dia. bulk gravity outfall sewer when it reaches capacity (Item OHS13.4)	R3.426
		New gravity sewer when existing 525 mm dia. outfall sewer reaches capacity (Item OHS13.2)	R4.506
	2022	Upgrade existing gravity (Investigate first). Verify the capacity of the Onrus Milkwood pump station first (Item OHS11.8)	R1.179
		Upgrade existing gravity when overflow problems occur when Whale Rock PS is upgraded (Item OHS19.1)	R1.600
	2025	Abandon existing Peach House rising main when outfall sewer is constructed to divert flow to Whale Rock PS (Item OHS30.2)	R0.008
		Decommission existing Hemel-en-Aarde rising main (Item OHS29.4)	R0.008
		New outfall gravity sewer for future areas GH1, GH5.1, GH5.2 & GH50 (Item OHS8.3)	R3.912
		New outfall gravity sewer for unserviced erven in Fisherhaven (Item OHS2.1)	R8.674
		New outfall gravity sewers for unserviced erven in Hawston (Item OHS6.3, Item OHS8.1, Item OHS8.10)	R10.455
		New outfall gravity sewer for unserviced erven in Onrus (Item OHS11.1)	R4.005
		New outfall gravity sewer to divert flow from Peach House PS to Whale Rock PS. Abandon existing gravity sewer (Item OHS30.3, Item OHS30.4)	R0.783
		New gravity sewer to divert flow from existing Hemel en Aarde PS to Sandbaai PS (Item OHS29.1)	R0.274
		Upgrade existing gravity sewer when existing Hemel en Aarde drainage area is diverted to Sandbaai PS (Item OHS29.2)	R2.203
		New rising main when future Greater Hermanus PS 1 is constructed (Item OHS2.3)	R0.330
		New rising main when future Greater Hermanus PS 12 is constructed (Item OHS24.3)	R1.204
		New rising main when future Greater Hermanus PS 3 is constructed (cost to the developer) (Item OHS4.2)	-
		New rising main when future Greater Hermanus PS 4 is constructed (Item OHS6.5)	R1.480
		New rising main when future Greater Hermanus PS 7 is constructed (Item OHS9.2)	R0.353
		New rising main when future pump station GH15 is constructed (cost to the developer (Item OHS28.2)	-
	2030	New outfall gravity sewer for future area GH2 (Item OHS3.2)	R1.472
		New outfall gravity sewer for future areas GH6.3 and GH6.5 (Item OHS7.5)	R1.570
		New outfall gravity sewers for unserviced erven in Fisherhaven (Item OHS1.1, OHS1.2, OHS1.4, OHS3.1)	R23.745

Table C.3.21: Future Bulk Sewer Pipeline and Sewer Drainage Network Infrastructure Required			
Scheme	**Year**	**Project**	**Cost (R Million)**
		New outfall gravity sewer for unserviced erven in Hawston (Item OHS6.1)	R16.003
		New outfall gravity sewers for unserviced erven in Hermanus (Item OHS15.1, Item OHS16.1, Item OHS17.1 and OHS18.1)	R18.550
		Upgrade existing 200 mm dia. outfall gravity sewer when it reaches capacity (Investigate first), modelled on minimum slope (Item OHS11.3)	R0.632
		Upgrade existing 400 mm dia. outfall gravity sewer when it reaches capacity (when Onrus Main PS is upgraded) (Item OHS13.5)	R2.544
		Upgrade existing outfall gravity sewer when it reaches capacity, modelled on minimum slope and diameter of 90 mm (Item OHS11.7)	R0.395
		Upgrade existing gravity sewer when future areas GH13 and GH28.1 develops (Item OHS12.4)	R0.710
		Upgrade existing gravity sewer when future areas GH8.3 - GH8.6 develop (Item OHS11.12)	R1.069
		Upgrade existing gravity when future areas GH8.5 and GH8.6 develop (Item OHS11.11)	R0.604
		New rising main when future Greater Hermanus PS 10 is constructed (Item OHS17.3)	R0.428
		New rising main when future Greater Hermanus PS 2 is constructed (Item OHS3.4)	R0.304
		New rising main when future Greater Hermanus PS 5 is constructed (Item OHS7.4)	R0.366
		New rising main when future Greater Hermanus PS 9 is constructed (Item OHS18.3)	R0.404
		Upgrade existing rising main when Sandbaai pump station 1 reaches capacity (Item OHS12.6)	R5.182
	2035	Upgrade existing rising main when Fisherhaven pump station reaches capacity (Item OHS1.6)	R4.695
		New outfall gravity sewer for future areas GH1, GH5.1 & GH50 (including main road crossing) (Item OHS8.2)	R4.440
		New outfall gravity sewer for unserviced erven in Hawston (Item OHS7.1)	R6.388
		New outfall gravity sewer for unserviced erven in Voëlklip (Item OHS14.1)	R5.750
		Upgrade existing gravity sewers when existing 250 mm dia. outfall sewer reaches capacity (Item OHS1.3, OHS1.7)	R1.278
		Upgrade existing 300 mm dia. outfall gravity sewer when it reaches capacity (Item OHS8.6)	R1.631
		Upgrade existing outfall gravity sewer when it reaches capacity (Item OHS8.5)	R2.173
		Upgrade existing outfall gravity sewers when it reaches capacity, modelled on minimum slope (Item OHS12.7, OHS12.8)	R2.458
		New gravity sewer when future area GH6.4 develops (Item OHS9.3)	R0.450
		New gravity sewer when future area GH6.6 develops (Item OHS9.4)	R0.447
		New gravity sewer when future areas GH8.3 - GH8.6 develop (Item OHS11.13)	R1.300
		Upgrade existing gravity sewers when overflow problem occur (Investigate first) (Item OHS8.8, OHS8.9)	R1.245
	2040	New outfall gravity sewer for future area GH46 (Item OHS27.1)	R1.302
		New outfall gravity sewer for future areas GH1 and GH50 (Item OHS8.7)	R4.544
	2045	Upgrade existing 315 mm dia. outfall gravity sewer when it reaches capacity (Item OHS27.2)	R5.697
		New rising main when future Greater Hermanus PS 6 is constructed (Item OHS5.2)	R2.434
	2050	New rising main when future areas GH1 and GH50 develop (Item OHS20.2)	R1.465
		New gravity sewer when future areas GH1 and GH50 develop (Item OHS20.3)	R1.314
	2060	New rising main when future areas GH1 and GH50 develop (Item OHS20.4)	R1.225
	Subtotal		**R171.151**
Stanford	2030	New gravity sewer required when future Stanford PS1 is constructed (Item OSS2.2)	R0.222
		New rising main when future Stanford PS 1 is constructed (Item OSS3.3)	R0.285
		New gravity outfall sewer for unserviced erven in Stanford South (Item OSS3.1)	R2.439
		Upgrade existing gravity outfall sewer (Investigate first) when it reaches capacity, modelled on minimum slope (Item OSS2.4)	R0.850
	2035	Upgrade existing gravity sewers (Investigate first) when it reaches capacity, modelled on minimum slope (Item OSS1.3. OSS2.3)	R1.920
		Upgrade existing 200 mm dia. gravity outfall sewer when it reaches capacity (Item OSS1.4)	R3.561
	2040	Upgrade existing gravity outfall sewer (Investigate first) when it reaches capacity, modelled on minimum slope, verify capacity of Sunrise Estate PS first (Item OSS1.2)	R1.272
	2045	Upgrade existing gravity (Investigate first). Modelled on minimum slope and diameter of 160 mm, verify capacity of Sunrise Estate PS first (Item OSS1.1)	R0.440
	2050	New rising main when future Stanford PS 2 is constructed (Item OSS5.3)	R0.443
	Subtotal		**R11.432**
Greater Gansbaai	2022	Upgrade existing outfall gravity sewers when it reaches capacity, modelled on minimum slope (Investigate first) (Item OGS8.2, Item OGS8.3)	R1.840
	2025	New outfall gravity sewer for future area GG30 (Item OGS24.1)	R1.005
		New outfall gravity sewers for unserviced erven in Gansbaai (Item OGS7.2, Item OGS7.3, Item OGS8.1)	R7.939
		New gravity sewer required to decommission Conservancy Tank no. 1 (Item OGS14.2)	R0.581

Table C.3.21: Future Bulk Sewer Pipeline and Sewer Drainage Network Infrastructure Required			
Scheme	**Year**	**Project**	**Cost (R Million)**
		New gravity sewer required to decommission Conservancy Tank no. 2 (Item OGS15.3b)	R0.086
		Upgrade existing outfall gravity sewers when it reaches capacity, modelled on minimum slope (Item OGS7.10, Item OGS7.11)	R0.393
		New rising main when future De Kelders Main PS is constructed (Item OGS.B4)	R5.268
		New rising main when future De Kelders PS 4 is constructed (Item OGS4.7)	R1.294
		New rising main when future Kleinbaai Main PS is constructed (Item OGS.B2)	R8.105
		New rising main when future Kleinbaai PS 1 is constructed (Item OGS14.4)	R0.451
		New rising main when future Kleinbaai PS 2 is constructed (Item OGS15.11)	R3.054
		New rising main when Future PS KB 6 is constructed (Item OGS22.2)	R0.592
		New gravity sewer when Kleinbaai PS 1 and rising main is constructed (Item OGS15.7)	R0.895
	2030	New outfall gravity sewer for Birkenhead (Item OGS24.4)	R1.580
		New outfall gravity sewer for future area GG2 (Item OGS4.5)	R1.001
		New outfall gravity sewer for future area GG3 (Item OGS7.5)	R0.488
		New outfall gravity sewers for unserviced erven in De Kelders (Item OGS3.2, Item OGS4.2, Item OGS4.3, Item OGS4.4)	R5.520
		New outfall gravity sewers for unserviced erven in Gansbaai (Item OGS7.1, Item OGS7.4, Item OGS7.9a, Item OGS12.1, Item OGS13.1, Item OGS13.2)	R23.381
		New outfall gravity sewer for unserviced erven in Kleinbaai (Item OGS14.1)	R9.741
		New rising main when Birkenhead Main pump station is constructed (Item OGS24.2)	R1.489
		New gravity sewers required to decommission Conservancy Tank no. 2 (Item OGS15.2, Item OGS15.3a)	R2.749
		New gravity sewer required to decommission Conservancy Tank no. 3 (Item OGS15.4)	R1.753
		New gravity sewer when future area GG2 develops (Item OGS3.3)	R0.673
		New gravity sewer when future area GG6 develops (Item OGS7.6)	R1.213
		New rising main when future De Kelders PS 3 is constructed (Item OGS3.5)	R0.820
		New rising main when future Gansbaai PS 2 is constructed (Item OGS9.2)	R0.353
		New rising main when future Gansbaai PS 4 is constructed (Item OGS12.3)	R0.245
		Upgrade existing rising main when Kolgans pump station 2 reaches capacity (Item OGS10.2)	R0.568
	2035	New outfall gravity sewer for future area GG16.2 (Item OGS15.12)	R0.388
		New outfall gravity sewer for future area GG17 (Item OGS15.6)	R0.495
		New outfall gravity sewer for future area GG18 (Item OGS17.3)	R2.894
		New outfall gravity sewer for future areas GG22.1 and GG23.2 (Item OGS7.9b)	R0.507
		New outfall gravity sewers for unserviced erven in De Kelders (Item OGS2.2, Item OGS4.1, Item OGS5.1)	R21.514
		New outfall gravity sewers for unserviced erven in Franskraal (Item OGS17.2, OGS18.3)	R1.051
		New outfall gravity sewer for unserviced erven in Gansbaai (Item OGS6.1)	R12.895
		New outfall gravity sewers for unserviced erven in Kleinbaai (Item OGS15.1, 16.1)	R8.461
		New gravity sewer required to decommission Conservancy Tank no. 3 (Item OGS15.5)	R0.358
		New gravity sewer required when future area GG12 develops (Item OGS15.8)	R0.433
		New gravity sewer required when future area GG13 develops (Item OGS15.9)	R0.448
		Upgrade existing outfall gravity sewers when it reaches capacity (Investigate first), modelled on minimum slope (Item OGS7.7, OGS8.10, OGS8.8)	R2.663
		New gravity sewers when future area GG1 develops (Item OGS2.6, OGS3.6)	R1.411
		New gravity sewer when future area GG28 develops (Item OGS1.4)	R0.675
		New rising main when future De Kelders PS 1 is constructed (Item OGS1.3)	R0.058
		New rising main when future De Kelders PS 2 is constructed (Item OGS2.5)	R0.472
		New rising main when future De Kelders PS 5 is constructed (Item OGS5.3)	R0.313
		New rising main when future Franskraal PS 1 is constructed (Item OGS17.5)	R4.574
		New rising main when future Gansbaai PS 1 is constructed (Item OGS6.3)	R0.231
		New rising main when future Kleinbaai PS 3 is constructed (Item OGS16.3)	R0.366
	2040	New rising sewer for Birkenhead (Item OGS20.1)	R0.599
		New outfall gravity sewers for unserviced erven in De Kelders (Item OGS1.1, OGS3.1)	R15.420
		New gravity sewers for unserviced erven in Franskraal (Item OGS17.1, OGS18.2, OGS19.5)	R10.518
		New gravity sewers for unserviced erven in Franskraal, when future area GG19 develops (Item OGS18.4, OGS19.2)	R1.930
		New gravity sewer required to transfer sewage flow from Uilenskraalmond to future Franskraal PS no. 9 (Item OGS32.1)	R0.638
		New gravity sewer when future area GG1 develops (Item OGS2.3)	R0.552
		New gravity sewers when future area GG31 develops (Item OGS27.1, OGS27.2, OGS28.1)	R6.906

Table C.3.21: Future Bulk Sewer Pipeline and Sewer Drainage Network Infrastructure Required			
Scheme	**Year**	**Project**	**Cost (R Million)**
		New rising main when future area GG33 develops (Item OGS33.2)	R0.451
		Upgrade existing gravity sewers when future area GG33 develops and existing system reaches capacity (Item OGS8.4, OGS8.6)	R5.227
		New gravity sewers when future area GG33 develops and existing system reaches capacity (Item OGS8.7)	R11.232
		New gravity when future areas GG32 and GG33 develop (Item OGS31.1)	R2.880
		New rising main when future Franskraal PS 2 is constructed (Item OGS18.6)	R1.354
		New rising main when future Franskraal PS 3 is constructed (Item OGS19.4)	R0.861
		New rising main when future Franskraal PS 6 is constructed (Item OGS28.3	R1.054
		New rising main when future Franskraal PS 7 is constructed (Item OGS29.2)	R1.020
		New rising main when future Franskraal PS 8 is constructed (Item OGS31.3)	R2.135
		New rising main when future Franskraal PS 9 is constructed (Item OGS32.3)	R3.548
		New rising main when future Gansbaai PS 5 is constructed (Item OGS23.2)	R0.435
	2045	New outfall gravity sewers for Birkenhead (Item OGS20.3, OGS21.1)	R6.364
		New outfall gravity sewer for unserviced erven in De Kelders (Item OGS2.1)	R7.830
		New outfall gravity sewers for unserviced erven in Franskraal (Item OGS18.1, OGS19.1)	R14.149
		New rising main when future Franskraal PS 4 is constructed (Item OGS25.4)	R0.426
		New rising main when Future PS KB 5 is constructed (Item OGS21.3)	R0.895
	2050	New outfall gravity sewers for unserviced erven in Franskraal (Item OGS25.1, OGS25.2)	R8.889
		New rising main when future Franskraal PS 5 is constructed (Item OGS26.3)	R0.377
	2055	New outfall gravity sewer for unserviced erven in Franskraal (Item OGS26.1)	R10.402
	Subtotal		**R259.376**
Pearly Beach	2020	New rising main when Package plant is decommissioned (Item OPS4.5)	R0.770
	2030	New gravity outfall sewer for unserviced erven in Pearly Beach (Item OPS1.4b, OPS1.5, OPS1.6, OPS1.7)	R3.526
		New gravity sewer required when future area PB1.3 develops (Item OPS1.4a)	R0.392
		New rising main when future Pearly Beach PS 1 is constructed (Item OPS1.3)	R2.253
	2035	New gravity outfall sewers for unserviced erven in Pearly Beach (Item OPS1.1, OPS2.1, OPS3.2, OPS4.2)	R12.427
		New rising main when future Pearly Beach PS 2 is constructed (Item OPS2.3)	R0.173
		New rising main when future Pearly Beach PS 3 is constructed (Item OPS3.4)	R1.504
		New rising main when future Pearly Beach PS 4 is constructed (Item OPS4.4)	R0.491
		New gravity outfall sewers for unserviced erven in Pearly Beach (Item OPS3.1, OPS4.1)	R25.866
	Subtotal		**R47.402**
Baardskeerdersbos	2040	New gravity outfall sewer for unserviced erven in Baardskeerdersbos (ItemOBaS1.1)	R5.424
	Subtotal		**R5.424**
Buffeljags Bay	2045	New gravity outfall sewer for unserviced erven in Buffeljags Bay (Item OBJS1.1)	R0.537
	Subtotal		**R0.537**
Total			**R878.747**

SEWER PUMP STATIONS

The Sewer Master Plan (June 2021) has indicated that based on the most likely land-use development scenario, it will be necessary for the following sewer pump stations.

Table C.3.22: Future Sewer Pump Stations Required			
Scheme	**Year**	**Project**	**Cost (R Million)**
Buffels River	2030	New pump stations for Betty's Bay (Items OBS8.2, OBS9.5, OBS10.3, OBS11.2, OBS12.2, OBS13.2, OBS14.4, OBS15.2)	R13.431
		New pump stations required to pump sewage from Betty's Bay to Kleinmond WWTW (Items OBS.B5, OBS.B7, OBS.B9)	R13.811
	2035	New pump stations for Pringle Bay (Item OBS5.3, OBS6.3, OBS7.2)	R5.705
		Required to pump sewage from Pringle Bay to Betty's Bay (Item OBS.B3)	R2.974
	2040	New pump stations for Rooi Els (Item OBS1.2, OBS2.3, OBS3.5, OBS4.2)	R6.154
		New pump station required to pump sewage from Rooi Els to Pringle Bay (Item OBS.B1)	R1.817
	Subtotal		**R43.892**
Kleinmond	2023	Upgrade existing pump station when it reaches capacity, verify existing pump capacity first (Item OKS1.3)	R0.024

Table C.3.22: Future Sewer Pump Stations Required			
Scheme	**Year**	**Project**	**Cost (R Million)**
	2025	Upgrade existing pump station when it reaches capacity (Item OKS3.1)	R0.976
	2035	Upgrade existing pump station when it reaches capacity with development of future area KM20 (Item OKS6.1)	R0.097
	Subtotal		**R1.097**
Greater Hermanus	2021	Upgrade existing pump station when it reaches capacity, verify existing pump capacity first (Item OHS22.1)	R0.024
	2022	Upgrade existing PS when it reaches capacity. Investigate existing capacity and operation of system from WWTW Main PS to Hermanus WWTW first (Item OHS19.2)	R0.024
	2023	Upgrade existing PS capacity in order to reach scouring velocity through rising main (Item OHS23.1)	R0.644
	2025	Abandon existing Peach House PS when outfall sewer is constructed to divert flow to Whale Rock PS (Item OHS30.1)	R0.216
		Decommission existing Hemel-en-Aarde PS (Item OHS29.3)	R0.216
		New pump station for Fisherhaven (Item OHS2.2)	R1.508
		New pump station for Hawston (Item OHS6.4)	R2.148
		New PS when future area GH49 develops (cost to the developer) (Item OHS4.1)	-
		New PS when future areas GH6.2 and GH6.5 develop (Item OHS9.1)	R0.620
		New PS when future development area GH6.1 develops (cost to the developer) (Item OHS28.1)	R0.414
		Upgrade existing PS (Investigate first) when overflow problems occur (capacity of upstream PS more than Hermanus PS 4) (Item OHS21.1)	R0.024
		New PS when Zwelihle informal area is formalized (Item OHS24.2)	R0.620
	2030	New pump station for Fisherhaven (Item OHS3.3)	R1.628
		New pump station for Hawston (Item OHS7.3)	R1.579
		New pump stations for Hermanus (Item OHS17.2, OHS18.2)	R3.096
		Upgrade existing PS (Investigate first) when it reaches capacity (Item OHS11.10)	R0.024
		Upgrade existing PS when it reaches capacity, verify existing pump capacity first (Item OHS12.5)	R0.024
	2035	Upgrade existing PS when it reaches capacity, verify existing pump capacity first (Item OHS1.5)	R0.024
	2045	New PS when future area GH4 develops (Item OHS5.1)	R2.250
	2050	New PS when future areas GH1 & GH50 develop (Item OHS20.1)	-
	2060	New PS when Future areas GH1 & GH50 develop (Item OHS20.5)	-
	Subtotal		**R15.083**
Stanford	2030	New pump station for Stanford South (Item OSS3.2)	R1.508
	2050	New pump station for Stanford North (Item OSS5.2)	R0.518
	Subtotal		**R2.026**
Greater Gansbaai	2024	New pump station required to pump sewage from Kleinbaai and Franskraal to Gansbaai WWTW (Item OGS.B1)	R5.300
	2025	New pump station for De Kelders (Item OGS4.6)	R2.542
		New pump stations for Kleinbaai (Item OGS14.3, OGS15.10)	R4.451
		New pump station required to pump sewage from De Kelders to Gansbaai Hawe pumping station (Item OGSB.3)	R2.832
		New pump station when lower lying erven of Perlemoenpunt develop (Item OGS22.1)	R1.658
	2030	New Main pump station for Birkenhead drainage area (Item OGS24.3)	R1.628
		New pump station for De Kelders (Item OGS3.4)	R2.104
		New pump stations for Gansbaai (Item OGS12.2, OGS9.1)	R2.381
		Upgrade existing pump station when existing pump station reaches capacity, verify existing pump capacity first (Item OGS.B5, OGS10.1)	R0.637
	2035	New pump stations for De Kelders (Item OGS1.2, OGS2.4, OGS5.2)	R4.432
		New pump stations for Franskraal (Item OGS17.4, OGS18.5)	R4.501
		New pump station for Gansbaai (Item OGS6.2)	R1.598
	2040	New pump station for Birkenhead drainage area (Item OGS20.2)	R1.568
		New pump station for Franskraal (Item OGS19.3)	R1.866
		New pump station for Kleinbaai (Item OGS16.2)	R1.508
		New pump station when future area GG31 develops (Item OGS28.2, OGS29.1)	R3.613
		New pump stations when future area GG33 develops (Item OGS32.2, OGS33.1)	R3.680
		New pump station when future areas GG10.2 & GG11.2 develop (Item OGS23.1)	R0.538
		New pump station when future areas GG32 & GG33 develop (Item OGS31.2)	R3.819
	2045	New pump station for Birkenhead drainage area (Item OGS21.2)	R1.206
		New pump station for Franskraal (Item OGS25.3)	R1.718
	2050	New pump station for Franskraal (Item OGS26.2)	R1.568

Table C.3.22: Future Sewer Pump Stations Required			
Scheme	**Year**	**Project**	**Cost (R Million)**
	Subtotal		**R55.148**
Pearly Beach	2030	New pump station for Pearly Beach (Item OPS1.2)	R2.250
	2035	New pump stations for Pearly Beach (Item OPS2.2, OPS3.3, OPS4.3)	R5.181
	Subtotal		**R7.431**
Total			**R124.677**

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 2020/2021 financial year (Ml/d).

Table C.3.23: Existing Hydraulic Design Capacities and Flows at each of the WWTWs (Ml/d)						
WWTW	**Existing Hydraulic Capacity**	**Peak Month Average Daily Flow**	**Average Daily Flow (2020/2021)**	**Average Wet Weather Flow (Jun'21, Jul'20, Aug'20)**	**Average Daily Flow as a % of Design Capacity**	**Final Effluent Compliance for 2020/2021 against *Authorisation***
Kleinmond	0.997	1.723 (Jun 21)	1.520	1.627	163.2%	Microbiological: 100.0% Chemical: 68.8% Physical: 91.7% *General Limits*
Hawston	0.700	1.165 (May 21)	0.610	0.841	120.1%	Microbiological: 100.0% Chemical: 89.6% Physical: 72.2% *General Limits*
Hermanus	12.000	8.256 (May 21)	6.458	7.113	53.8%	Microbiological: 100.0% Chemical: 100.0% Physical: 100.0% *License 17 October 2016*
Stanford	1.2000	1.370 (Aug 20)	1.064	1.194	88.7%	Microbiological: 100.0% Chemical: 95.8% Physical: 88.9% *General Limits*
Gansbaai	2.000	0.931 (Dec 20)	0.859	0.847	43.0%	Microbiological: 100.0% Chemical: 97.9% Physical: 94.4% *General Limits*
Eluxolweni	0.259	0.147 (May 21)	0.081	0.066	31.3%	Microbiological: 100.0% Chemical: 60.4% Physical: 33.3% *General Limits*

Note: Where parameters were resampled, due to failures, the resampled results were used to calculate the above compliance percentages.

The organic design capacities of the WWTWs and the current loadings at the WWTWs are indicated in the table below.

Table C.3.24: Existing Organic Design Capacities and Historical Loadings at the WWTWs							
WWTW	**Organic Design Capacity (kg COD/d)**	**2018/2019**		**2019/2020**		**2020/2021**	
		Average Load (kg COD/d)	**% of Design Capacity**	**Average Load (kg COD/d)**	**% of Design Capacity**	**Average Load (kg COD/d)**	**% of Design Capacity**
Kleinmond	843	1 021	121.1%	912	108.2%	1 133	134.4%
Hawston	968	689	71.2%	738	76.3%	1 748	180.6%
Hermanus	9 000	3 851	42.8%	4 926	54.7%	4 935	54.8%
Stanford	1 200	624	52.0%	1 003	83.6%	1 116	93.0%
Gansbaai	3 600	1 074	29.8%	875	24.3%	1 136	31.6%
Eluxolweni	198	-	-	36	18.2%	106	53.5%

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.

Table C.3.25: Average Daily and Peak Month Future Projected WWTW Flows (Ml/d)

WWTW	Existing Hydraulic Capacity	Average Daily Future Projected WWTW Flows					Peak Month Average Daily Future Projected WWTW Flows				
		2025	2030	2035	2040	2045	2025	2030	2035	2040	2045
Kleinmond	0.997	1.763	2.133	2.577	2.930	3.342	2.891	3.498	4.226	4.805	5.481
Hawston	0.700	8.942	11.742	15.415	20.241	25.025	10.552	13.856	18.190	23.884	29.530
Hermanus	12.000										
Stanford	1.2000	1.273	1.508	1.792	2.138	2.557	1.426	1.689	2.007	2.395	2.864
Gansbaai	2.000	1.160	1.677	2.373	3.307	4.563	1.241	1.794	2.539	3.538	4.882
Eluxolweni	0.259	0.123	0.182	0.265	0.379	0.536	0.228	0.337	0.490	0.701	0.992

Note: The peak month factors used in the above table are1.64 for Kleinmond, 1.18 for Hawston and Hermanus, 1.12 for Stanford, 1.07 for Gansbaai and 1.85 for Eluxolweni.

Kleinmond WWTW: The 2021 Green Drop score for the WWTW was 88% and the wastewater risk rating stayed roughly the same at 47.0% in 2013 and 47.1% in 2021. **It can be noted from Tables C.3.23 and C.3.24 that both the current hydraulic and organic design capacities are inadequate to meet the current demands.** The upgrade of the plant is included in the draft Capex budget for 2022/23 and 2023/24 and environmental authorisation for the project is being awaited. The recommendations from the detail WWTW Process Audit (June 2021) were as follows.

- The bags in which the screenings are stored (for removal to Hermanus) are neatly stacked, but it should be considered to clearly mark this storage area as hazardous.
- Install outlet flowmeter.
- Reduce the MLSS concentration to no more than 3 500 mg/l and then maintain these levels by daily wasting
- Increase aeration basin pH to closer to pH 8.
- Alkalinity is a limiting factor in nitrification – Raw ammonia exceeds plant's capacity (based on Alkalinity) by 30mg/l.
- Gather data on peak flows to better understand the effect these have on clarifier performance.
- Remove old / empty drums from site as to create space for stock to be stored and controlled on site.
- Manager (or independent laboratory's sampler) to conduct random residual chlorine and/or microbiological sampling to verify disinfection.
- Run the press 6.5 hours per day, every day.
- Allow Sludge Lagoons to dry out and start with the cleaning of these as to create spare capacity should the press be out of order for an extended period.
- Ensure spreadsheet is being kept up to date and not only populated once a month.
- Process Controllers to interact with the data collected on site - draw graphs etc. to track operational changes (quality & quantities).
- Process Controllers should receive feedback from both the internal lab and the independent laboratory.
- The calibration of the equipment used on site should be verified by the internal lab.
- Consider expanding the spreadsheet to provide operational feedback and not act as database only.
- Ensure Process Controllers are aware of the Preventative Maintenance Schedule.
- Ensure records / logbooks pertaining to preventative maintenance are also available on site.
- Start sensitising Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the Works.

The Technical Feasibility Report for the upgrading of the Kleinmond WWTW (February 2021), included the following four options to upgrade the process.

- Option 1 (Cost R15 900 000): Change the existing reactor to an anoxic basin and build a new aerobic reactor basin equipped with surface aerators.
- Option 2 (Cost R13 100 000): Retain the existing reactor as an aerobic basin and build a new anoxic reactor basin. The existing aerobic reactor basin will make use of the existing floating aerators until they have reached the end of their economic life cycle.
- Option 3 (Cost R19 800 000): Retain the existing reactor as an aerobic basin and build a new deep aerobic reactor basin equipped with FBD aeration.
- Option 4 (Cost R15 600 000): Add a new anoxic / aerobic reactor basin and split the existing reactor into an anoxic/aerobic reactor basin.

Each of the options have their advantages and disadvantages. Option 1 allows for a new aerobic reactor that can be designed to suit aeration requirements. Option 2 is the cheapest option but uses the existing aerator that will likely need replacing in 5 years. Also, the current reactor whose depth is less than optimum depth for aeration will be used. Option 3 has a high initial capital cost but allows for a smaller reactor footprint which may be important if environmental requirements restrict the reactor size. Also, lower aeration power is required with fine bubble diffusers. Option 4 is more expensive than Option 2 but allows for future modularisation of the WWTW. The above estimated cost exclude professional fees of all options.

The above options do not allow for upgrading other important refurbishments / replacements that were highlighted in the 2018 Conditional Assessment report. The required refurbishments were reassessed in February 2021 and the table below gives an overview of the priority items for refurbishment.

Table C.3.26: Refurbishment Priority Items for the Kleinmond WWTW

Process Area	Refurbishment	Cost (Excl. VAT)	Comment with regard to Cost
Priority 1: Important			
Disinfection	Upgrading chemical dosing system	R75 000	This costing is for an HTH disinfection system where chemical preparation tank and dosing system is added. Chlorine disinfection would require a new building and chlorination system, so it has been ignored.
	Contact tank	R200 000	This will strongly depend on environmental requirements. For a contact time of 30 minutes, a simple 4m x 4m x 3m deep tank would be sufficient.
Dewatering facility	Investigate reticulation system	N/A	Could not give price, limited information. Price could range from less than 100 000 if only buffer tanks are provided to over a million if pipeline from Kleinmond and a booster pump is provided.
	Booster pump		
	Extension of building	R1 680 000	Cost accounts for a new dewatering building built to house equipment.
Electronic	Add outlet flowmeter	R100 000	Will replace pipework and flow meter in existing flow meter chamber.
Sub-Total		R2 055 000	
P&Gs		R1 030 000	
Contingency		R360 000	
Total		**R3 445 000**	
Priority 2: Semi-important			
Screening and grit removal	Minimal concrete corrosion	R35 000	Priced for internal walls, further investigation required for accurate costing.
	Platform and cut-out	R120 000	
	Built in sluice gates	R250 000	
Secondary settling tank	Motor	R58 000	Motor inspection
	Scrapper	R175 000	Inspection and general repairs where required.
	General	R175 000	Tank emptying and cleaning
Bioreactor	Remove splash guards	N/A	Will be done as part of existing reactor refurbishment.
RAS pump station	Lower flowrate if possible	N/A	Need to source more information on pump curves. Either the impeller could be replaced or a belt between the motor and pump can be added.
	Check air release valve and repair/replace	R50 000	Price for replacing instead of repair as the cost is similar.
Disinfection	Allow for effluent sampling	R20 000	Price based on Monitor labs estimate for different project.
	Install second service water pump	R95 000	Need to understand limitation with existing service water supply, so the price is an estimate only.
Dewatering Facility	Reconfigure pipework	R250 000	

Table C.3.26: Refurbishment Priority Items for the Kleinmond WWTW			
Process Area	**Refurbishment**	**Cost (Excl. VAT)**	**Comment with regard to Cost**
	Restoration of lagoons	R2 900 000	Emptying, cleaning and restoration of lagoons.
Electrical	Wiring and MCC servicing	R240 000	Service electrical infrastructure and replace / repair faults and inspect MCC wiring.
Electronic	Link important signals to Master SCADA at Preekstoel WTW	R140 000	
	SCADA reporting system to monitor performance of infrastructure e.g. do comparisons m^3/d/kWh	R590 000	
General	Computer for data capturing and communication	R10 000	Price for general desktop
	Pepper spray system	N/A	Need more information
	Fencing	R975 000	Site fence and security kiosk
	Site lighting	R50 000	General lighting upgrade across site
Sub-Total		R6 133 000	
P&Gs		R3 050 000	
Contingency		R1 060 000	
Total		**R10 243 000**	
Priority 3: Nice to have			
Dewatering Facility	Add a second belt press	R6 000 000	
Electrical	New MCC building	R330 000	
	Move MCC to new building	R175 000	
	MIS: Management Information System	N/A	Further investigation is required
General	Relocate admin building	R750 000	Build new admin building
Sub-Total		R7 255 000	
P&Gs		R3 630 000	
Contingency		R1 250 000	
Total		**R12 135 000**	

Hawston WWTW: The 2021 Green Drop score for the WWTW was 89% and the wastewater risk rating increased from 29.0% in 2013 to 52.9% in 2021. **It can be noted from Tables C.3.23 and C.3.24 that the Hawston WWTW also needs to be upgraded in the nearby future.** The upgrading of the plant is included in the draft Capex budget for 2024/25 and the following two years. The recommendations from the detail WWTW Process Audit (June 2021) were as follows.

- As there is no grit removal prior to the transfer pumpstation scheduled cleaning of the sump should be prioritised.
- Look into ways of reducing the concentrated velocity onto the Head of Works screen.
- Provide a dedicated area for vacuum tanker discharge / secure the operation by providing a built-in quick-couple connection for discharge (eliminate the need to open and close the manhole). As an interim measure, ensure the team follows a Standard Operating Procedure which includes securing the area while they are working and ensure the manhole cover is replaced once they leave.
- Reduce the MLSS concentration to no more than 3 500 mg/l and then maintain these levels by daily wasting
- Increase aeration basin pH to closer to pH 8.
- Alkalinity is a limiting factor in nitrification – average raw sewage ammonia exceeds plant capacity, based on Alkalinity, by 17 mg/l.
- Install standby dosing pump / ensure standby unit is available (in safe storage) for quick installation should the need arise.
- Monitor newly installed system to assess efficiency over a longer period.
- Prepare a roadway for the trucks to remove the sludge skip – even importing concrete stone or similar would create some stability.

- Continue running the press 12 hours per day, every day.
- Clean the drying beds and prepare them for use. Should they be required on a regular basis one could consider laying some bricks with holes in them onto the sand -0 this minimises weed re-growth and facilitates easy sludge removal while still allowing drainage to take place.
- Ensure spreadsheet is being kept up to date and not only populated once a month.
- Process Controllers to interact with the data collected on site - draw graphs etc. to track operational changes (quality & quantities).
- Process Controllers should receive feedback from both the internal lab and the independent laboratory (last feedback printout dated Jan '21).
- The calibration of the equipment used on site should be verified by the internal lab.
- Consider expanding the spreadsheet to provide operational feedback and not act as database only.
- Ensure Process Controllers are aware of the Preventative Maintenance Schedule.
- Ensure records / logbooks pertaining to preventative maintenance are also available on site.
- Start sensitising Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.

The Refurbishment of the Hawston WWTW Report, March 2018, recommended the following Operation-, Refurbishment- and Upgrade interventions for the Hawston WWTW.

Operation Interventions: Operation interventions include changing or optimising sludge age, recycle rates, etc. The capacity assessment in Section 8 of the Report showed that operating at 20 days sludge age can provide compliant wastewater treatment of up to 700 m^3/d ADWF capacity.

However, the 700 m^3/d ADWF capacity can only be achieved under average influent concentrations and with adequate sludge wasting. The latter requirement is approximately 253 kgDS/d, or 4.3 m^3/h @ 0.58% TSS sludge feed to dewatering plant for 9.8 hours per day. Operating the dewatering plant under these conditions is not practical and thus the Municipality should consider upgrading the entire dewatering system.

No other operation interventions were identified that can improve plant performance as there is limited flexibility in the disinfection system and RAS recycle pumps.

Refurbishment Interventions: These interventions are primarily civil and mechanical in nature. The table below gives an overview of the recommended refurbishment items.

Table C.3.27: Refurbishment Interventions for the Hawston WWTW

Process Area	Refurbishment	Comment / Description
Priority 1: Critical: Failure will result in complete process failure or cause plant shutdown or increased risk of severe health and safety events. Estimated Project Cost R13 490 000 (Excl. Fees)		
Sludge Treatment	New sludge feed pump (2 No)	Feed pump and conveyer is undersized for the capacity of the screw press.
	Maintenance of screw press (see note on right)	Screw press capacity is not adequate for activated sludge plant. Recommended to service current press and relocate to a more suitable works.
	New wash water pump and intake location reconfiguration	
	New belt press 2m wide	Provide new sludge belt-press sized sufficiently for this application.
	Dewatering MCC and related cabling	The intake sump is a collection point for scum and debris.
General	New MCC building for bioreactor, dosing system and dewatering MCC	New building to house all MCC equipment
Bioreactor	Replace aerator (22kW)	Has exceeded operational lifespan
	Replace aerator (30kW)	
	Replace two mixers	
	Bioreactor MCC and related cabling	Mixer shafts are damaged/bent
	New disinfection system – Contact Tank	Age of MCC is a concern
Disinfection	New disinfection system – Pumps and Equipment	A disinfection system does not exist on site, operators are dosing chemicals manually.
	Disinfection system MCC and related cabling.	
	Reconfiguration of pipework at pump station (Separate RAS / WAS and ML Recycle)	
	New pipework for RAS / WAS and ML Recycle	

Table C.3.27: Refurbishment Interventions for the Hawston WWTW		
Process Area	**Refurbishment**	**Comment / Description**
RAS / WAS / ML Recycle	New ML pump station	The combined RAS / WAS / Mixed liquor pump station and pipe work is undesirable. System is difficult to operate and flooding issues are occurring. Standby pumps are not available and valves show signs of deterioration. It is proposed that a new pump station with a new pipework configuration and standby pumps be installed.
	Second RAS / WAS Pump	
	Second ML Recycle Pump	
	New valves for RAS / WAS / ML Recycle	
Priority 2: Urgent: Failure will result in reduced plant capacity, or poor effluent compliance or difficult process control and operation. Such failure will however not cause plant shutdown or severe health and safety events. Estimated Project Cost R1 155 000 (Excl. Fees)		
Inlet works	Additional hand-rake screen at lower inlet works	Screening facility is difficult to operate. A drying slab and second hand-screen will improve operation.
	Improve screening removal and disposal and concrete repairs/adjustments	
SCADA	Integrate reporting of influent, effluent and sludge flow into telemetry system at inlet works	Better reporting will assist in plant monitoring, operation and control.
Settling Tank	Settling bridge motor	General maintenance on settling tank is needed. Emphasis on scum box and the discharge chamber.
	Settling tank inspection of scraper blades	
	Settling tank emptying and cleaning	
	Scum box repair	
Priority 3: Moderate: Items or issues that do not pose imminent plant failure or health and safety risks. Estimated Project Cost R980 000 (Excl. Fees)		
Inlet works	Replace hand stops with sluice gates	
Sludge Treatment	Drying beds repairs and refurbishment	Repairs to concrete and sand-layer is needed
General	Site perimeter fence repairs	

Upgrade Interventions: The activated sludge system does not need an upgrade as the bioreactor and settling tank are sufficiently sized. Improvements to the sludge dewatering plant and RAS/WAS pump station are however recommended.

Hermanus WWTW: The 2021 Green Drop score for the WWTW was 89% - 96% and the wastewater risk rating decreased from 45.0% in 2013 to 36.4% in 2021. **The capacity of the WWTW is adequate to meet the short to medium term future treatment requirements.** The recommendations from the detail WWTW Process Audit (June 2021) were as follows.

- Ensure tankers keep on discharging in the same way that they are currently doing. It would however be advisable to do periodic spot-check analyses on the contents being discharged.
- As the mechanical degritters seem to break down quite frequently, it would be advisable to consider a full refurbishment of these units.
- Aerators seems to be switching on and off quite frequently (DO control) – consider providing some delay function on the switchgear as to prevent this frequent switching from causing damage to the motors (also refer to OEM manual for maximum number of starts per hour recommended).
- Calibration / verification of the in-line DO meters should be done on a routine basis.
- Reduce the MLSS concentration to no more than 3 500 mg/l and then maintain these levels by daily wasting.
- Increase aeration basin pH to closer to pH 8.
- Investigate options for dealing with scum. As installing a scum draw-off system would be quite complex, one could consider a sprayer system to break up the scum and allow it to settle. This would have to include the installation of scum baffles. If scum is going to continue flowing into the Maturation Ponds, regular cleaning would be required.
- Increase RAS Pump capacity, i.e. provide bigger motors for pumps.
- Do not be over-reliant on the automated system - Process Controllers should be encouraged to closely monitor the performance of this section of their Works.
- Slightly increase Press operating hours to 4.5 hours per day, every day.
- Continue cleaning the drying beds and prepare them for use as and when required. Clean more beds as to provide more standby capacity.

- Process Controllers to interact with the data collected on site - draw graphs etc. to track operational changes (quality & quantities).
- The calibration of the equipment used on site should be verified by the internal lab
- Consider expanding the spreadsheet to provide operational feedback and not act as database only
- Ensure Process Controllers are aware of the Preventative Maintenance Schedule.
- Ensure records / logbooks pertaining to preventative maintenance are also available on site.
- Start sensitising Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.

The Hermanus Clarifier Flow Balance Investigation, June 2020, recommended the following mitigation measures for the Hermanus WWTW at an estimated cost of R1 100 000.

- Fixed V-notch weirs should be introduced to the splitter boxes to ensure a proportional distribution of flows to the SSTs is achieved across the range of flows that the clarification system would need to handle. Alternatively the system could be left as it is as even though flow is distributed unevenly the SSTs performance would remain within guideline values, with the exception that SST2 would be borderline at PWWF.

- V-notch sluice gates should be introduced at the discharge point of the RAS return lines to the RAS WAS pumpstation sump. The V-notch weirs would allow the operators to approximate the RAS flows and thus optimise them, while the sluice gates would enable the operators to flush the sludge collection lines to discourage blockages from forming.

- The provision of additional facilities to enable the operators to service the SSTs more readily such as a portable centrifugal pump to drain the SSTs more readily and an eductor to enable the operators to prime the siphon more easily.

- The pumpstation itself requires ongoing maintenance. In particular the handrailing at the RAS WAS pumpstation sump needs to be repaired.

- The pumpstation inspection revealed that the RAS pumps are in good condition and are performing as per the original design intent. A RAS flow meter should be introduced on the RAS pipeline. This would require a flow meter chamber with connections into the existing AC pipeline. This would enable the operators to optimise the RAS return flow and better maintain the pumps.

- The removal of scum was considered, but the authors experience is that scum removal mechanisms merely provide another layer of complexity to the plant and tend to become an operational headache. It is thus preferable to address the source of the scum, which is likely to either be biological, or due to the presence of fats, oils and grease (FOG). To determine this the samples of the MLSS was sent for analysis to determine the presence FOG, as well as a microbiological analysis report to describe the bacterial composition of the sludge to confirm if the source of scum accumulation is biological.

- The analysis indicated that there was no bulking sludge which could cause scum, but nor could it demonstrate that FOG was present in appreciable quantities. This will need to be investigated further through a sampling campaign for FOG.

Stanford WWTW: The 2021 Green Drop score for the WWTW was 89% - 90% and the wastewater risk rating increased from 29.0% in 2013 to 64.7% in 2021. The WWTW was recently upgraded and an updated Process Audit was therefore not done during 2021 for the new plant. **The capacity of the WWTW is adequate.**

Gansbaai WWTW: The 2021 Green Drop score for the WWTW was 89% - 96% and the wastewater risk rating increased from 35.3% in 2013 to 41.2% in 2021. **The capacity of the WWTW is adequate to meet the short to medium term future treatment requirements.** The recommendations from the detail WWTW Process Audit (June 2021) were as follows.

- Prioritise repairs to Head of Works equipment – also see Section 5.2 of the Process Audit Report dealing specifically with the condition of mechanical equipment.
- As the efficiency of the grit removal process might currently be reduced, it is recommended that the downstream buffer tank be cleaned out once the necessary repairs have been completed.
- Address the issue of Vacuum Tankers not discharging in the dedicated area.
- Reduce the MLSS concentration to no more than 3 500 mg/l and then maintain these levels by daily wasting.
- Increase reactor pH to closer to pH 8.
- Alkalinity is a limiting factor for nitrification – average ammonia exceeds plant' capacity, based on alkalinity, by 15 mg/l.
- Clean out Chlorine Contact Channel.
- Continue running the press 3.5 hours per day, every day.
- Ensure spreadsheet is being kept up to date and not only populated once a month.
- Process Controllers to interact with the data collected on site - draw graphs etc. to track operational changes (quality & quantities).
- The calibration of the equipment used on site should be verified by the internal lab.
- Consider expanding the spreadsheet to provide operational feedback and not act as database only.
- Ensure Process Controllers are aware of the Preventative Maintenance Schedule.
- Ensure records / logbooks pertaining to preventative maintenance are also available on site.
- Start sensitising Process Controllers to take more responsibility for aspects related to risk management pertaining to the operation of the works.

Pearly Beach WWTW: The 2021 Green Drop score for the WWTW was 88% and the 2021 wastewater risk rating for the plant was 52.9%. **The plant was only recently constructed and the capacity of the WWTW is still adequate to meet the short to medium term future treatment requirements.** The recommendations from the detail WWTW Process Audit (June 2021) were as follows.

- Replace screen (possibly with GRP instead of steel).
- Ensure screenings are periodically removed from the primary pond (Anaerobic Pond).
- Ensure the grit channels are cleaned on a routine basis (as the plant is left unattended this should not be neglected).
- Check grit channel flow velocity during tanker discharge – velocity not to exceed 0.3 m/s.
- Ensure that screenings are periodically removed from the primary pond.
- Investigate grit accumulation in the primary pond / Clean out the primary pond.
- Consider "boosting" the process in an attempt to improve process performance (short –term remedial step).
- Replace stolen booster pump.
- Ensure diluted hypochlorite solution is still effective.
- Check Residual Chlorine readings on regular basis.
- Ensure grit is removed, screenings are cleared from Primary Pond surface, required readings recorded and grounds are maintained.
- Filtered COD analyses could provide a different perspective on the system's compliance.

- Ensure records pertaining to maintenance are in line with best-practice principles

The WWTWs to be upgraded in Overstrand Municipality are summarised in the table below.

Table C.3.28: WWTWs to be Upgraded in the Future

WWTW	Short, Medium, Long Term	Estimated Cost (Vat Excluded)
Upgraded Kleinmond WWTW (Option 1)	Short	R15 900 000
Refurbishment of Kleinmond WWTW (Important and Semi-important priority items)	Short	R13 688 000
Upgrade Kleinmond WWTW to 3.5 Ml/d	Medium	R50 000 000
Upgrade Hawston WWTW to 2.0 Ml/d	Medium	R30 000 000
Upgrade Stanford WWTW to 2.0 Ml/d	Medium	R20 000 000
High priority interventions recommended for the Hermanus WWTW	Short	R1 100 000
Refurbishment interventions for the Hawston WWTW (Priority 1, 2 and 3)	Short	R16 154 000
Total		**R146 842 000**

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

- Kleinmond WWTW: One of three aerators is not working. No final effluent flow meter. Only one of the two submersible final effluent pumps is working. Only one of the Sodium Hypochlorite (Disinfection) dosing pumps are working.

- Hawston WWTW: Hand screen before grit channels is not working adequately (Inlet works). No control over screenings for period when screen is removed for cleaning. One of the aerators is in for repairs. Occasional spillage due to overflow from sludge return sump, due to sludge not flowing into sludge waste sump. Capacity of Sodium Hypochlorite dosing pump is inadequate and no standby pump. There was no disinfection of final effluent at the time of the site visit. Some of the maturation ponds are overgrown with reeds. Sludge feed pump for Huber Screw Press not working adequately. Skips with dry sludge are not regularly removed and Huber Screw Press was not in use during the site visit, because all the skips were full.

- Hermanus WWTW: Only one of the Vortex degritters is operational. The Odour Control System is not yet fully operational. Aerators No.4 and 10 are not working (Aerobic zone of Bioreactor). One of the mixers at the old anoxic tanks 1 and 2 is broken. The belt press was not in use during the site visit, because some of the bearings of the rollers were removed for repairs.

- Stanford WWTW: Coupling of tanker discharge pipe is broken, which result in spillage when the tanker discharge at the inlet works. The grit valve spindle is not secured to the wall at the inlet works. There are no locks for the covers of the raw sewage pump station. A Recirculation Pump No.1 was in for repairs (Bioreactor). Belt Press is not always working, because it needs to be reset occasionally after power failures (load shedding). Polyelectrolyte make-up dosing pumps are not working. The backup generator change-over is not always working.

- Gansbaai WWTW: Both grit removal pumps are not working. Paddle of only one of the degritters work. Screenings from the sewer PSs are dumped in the drying beds. Belt press is not working.

TOPIC 4: WATER SERVICES OPERATION AND MANAGEMENT

Topic C.4.1: Water Services O&M						
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 Is There an O & M Plan?	No	100.0	All required O&M tasks for the various water and sewerage infrastructure components should be implemented. Ensure the required O&M schedules are in place and signed off on a monthly basis at least.	100.0	Partially	92.9
Resources	No	100.0	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).	100.0	Partially	92.9
	No	100.0	The External Service Provider is responsible 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. Overstrand Municipality will monitor the External Service Provider's compliance with regard hereto.	100.0	Partially	92.9
Information	No	100.0	All incidents at the WTWs and WWTWs and on the water reticulation networks and sewer drainage networks need to be recorded and the Incident Management Protocols, as included in the Water Safety Plan and W_2RAPs, need to be followed.	100.0	Yes	100.0
	No	100.0	Ensure that the required O&M Manuals are in place for all the water and sewerage infrastructure.	100.0	Partially	92.9
Activity Control & Management	No	100.0	Groundwater: Implement recommended daily, weekly, monthly and six monthly O&M activities for the boreholes.	100.0	Yes	100.0
	No	100.0	Surface water infrastructure: Implement preventative maintenance procedures.	100.0	Partially	92.9
	No	100.0	Bulk and water reticulation networks and fittings: Compile daily, weekly, monthly and annual maintenance checklists for the maintenance activities for the water reticulation networks and fittings.	100.0	Partially	92.9
	No	100.0	WTWs: Evaluate the existing O&M schedules for the WTWs against the recommended O&M tasks and ensure all required activities are adequately monitored and recorded.	100.0	Partially	92.9
	No	100.0	Water PSs: Compile weekly and monthly maintenance checklists for the recommended activities for all the water PSs and continue to inspect all PSs on at least a weekly basis.	100.0	Partially	92.9
	No	100.0	Reservoirs: Compile maintenance checklists for the recommended reservoir maintenance activities and document all inspections.	100.0	Partially	92.9
	No	100.0	Remote monitoring and Control Systems: Ensure adequate maintenance is carried out on the SCADA systems and compile maintenance checklists for the recommended activities.	100.0	Partially	92.9
	No	100.0	Sewer PSs: Compile weekly and quarterly maintenance checklists for the recommended activities for all the sewer PSs and all centrifugal pump stations need to be inspected on at least a weekly basis.	100.0	Partially	92.9
	No	100.0	Bulk and sewer drainage networks: Annual, monthly and weekly schedules for maintenance should be drawn up for the bulk and sewerage networks. Regular cleaning of sewer lines and all blockages and their precise locations should be recorded.	100.0	Partially	92.9
	No	100.0	WWTWs: Evaluate the existing O&M schedules for the WWTWs against the recommended O&M tasks and ensure all required activities are adequately monitored and recorded.	100.0	Partially	92.9

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 Overstrand 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 is 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 Water and Wastewater Bulk Works Contract of Overstrand Municipality includes both Operational services and Maintenance services for the bulk water and sewerage infrastructure.

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. Overstrand Municipality and the Contractor appointed for the Water and Wastewater Bulk Works Contract need to continue to implement the standard recommended O&M tasks, for the various water and sewerage infrastructure components.

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	100.0	The Municipality will continue with the implementation of their WDM Strategy and Action Plan and the proposed WC/WDM Strategy to further reduce the NRW and Water Losses for the various water distribution systems.	100.0	Partially	92.9
	Yes	100.0	Continue with the implementation of the pipeline replacement programme. The location of pipe failures are recorded with accurate GPS coordinates. This improves the integrity of the output of the pipe failure model. It was recommended in the pipe replacement study that the pipe replacement in Overstrand Municipality is performed in accordance with the PRP values calculated in the study. Pipes with the highest PRP values should be considered to be replaced first.	100.0	Partially	92.9
Leak and meter repair programmes.	Yes	100.0	Continue with the monitoring of the MNFs for specific zones in order to identify areas for the implementation of specific WDM activities (Pressure Management, Repair of leaks, etc.).	100.0	Partially	92.9
	Yes	100.0	The Municipality will continue with the repairing of leaks at all the indigent households and the phased pro-active replacement of the old water meters, as identified through the detail water meter audit.	100.0	Partially	92.9
Consumer/end-use demand management: Public Information & Education Programmes	Yes	100.0	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.	100.0	Partially	92.9
	Yes	100.0	Continue to support schools with WDM initiatives (Especially during Water Week). Raise awareness amongst the public of water efficient devices and water conservation projects.	100.0	Partially	92.9
Conjunctive use of surface - and groundwater	No	100.0				100.0
Working for Water	No	100.0				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?

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	No	100.00				100.00

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 WDM Strategy and Action Plan is in place for Overstrand Municipality. DWS's Municipal Scorecard for assessing the potential for WC/WDM efforts in Municipalities was used to assess the potential for WC/WDM efforts in Overstrand Municipality. The proposed WC/WDM Strategy for Overstrand 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 Overstrand Municipality

Item 1: Development of a Standard Water Balance

Recommendation and Strategy:

- Continue with the monthly updating of the IWA Water Balances for all the systems and reporting on the NRW and Water Losses for each of the systems to management.
- Continue with the drafting of the annual WSDP Performance and Water Services Audit Report, which include the IWA Water Balances, as required by the Water Services Act.

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

- Implement the recommended WC/WDM activities in order to reduce the NRW and Water Losses further.
- Continue to calculate and quantify all unbilled authorized consumption by firstly identifying all the relevant consumers, e.g. Municipal buildings, parks, fire services, sport fields, etc. Unbilled consumption does not generate income but will enable the municipality to better quantify their actual water losses.

Funding and Budget Requirements:

The IWA Water Balances for the systems are updated on a monthly basis by the municipality.

Item 2: Pressurised System at all times

Recommendation and Strategy:

- Adequate human resources, technical skills and O&M budgets need to be allocated towards the operation, maintenance and refurbishment of the existing infrastructure, in order to ensure that systems are always pressurised.
- Existing water pump stations that are in a poor condition needs to be refurbished.

Funding and Budget Requirements:

Budgets as indicated under the individual items of the WC/WDM Strategy. Increase O&M budget allocations towards the refurbishment and replacement of old water infrastructure.

Items 3 and 4: Metering System

Recommendation and Strategy:

- All un-metered water connections need to be provided with water meters. Meters need to be read 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. Overstrand Municipality therefore needs to continue with the cleaning of the Treasury data and the municipality needs to identify and correct any inaccurate data in the system (See Table 7.5.1 of the Administration, Information and Comprehensive Overview Report for the 2021 Swift results).
- Consumer consumption checks / investigations need to be carried out where water usage is very low, but there are households on the property. This project will give a clear indication of where illegal or unregistered connections is being made and whether the meter is under reading the actual consumption, thus water is being used but not billed or recorded.
- The Municipality needs to continue with their meter audits for all the towns. All illegible / broken / old meters should be replaced. Any un-metered stands should be metered and meter readings in the billing system should be updated where required. All meter boxes should also be cleaned as part of the audits.
- Municipality needs to continue with the implementation of their Meter Management / Replacement program. An effective Meter Management / Replacement Program needs to achieve the following objectives:
  - Determine the on-going meter replacement programme;
  - Determine exception reports on meters which are suspected to be faulty;
  - Test and replace faulty meters; and
  - Size meters correctly.

  The activities of this program that needs to be budgeted for are as follows:
  - Research and development of a meter replacement policy and meter management / replacement programme;
  - Implementation of a uniform meter management information system;
  - Testing and replacing faulty meters reported by consumers (Part of reticulation function).
  - Replacement of domestic meters with AMR enabled format (where appropriate) in accordance with meter management / replacement programme.

Funding and Budget Requirements:

Continue to install water meters for all un-metered water connections. Estimated annual budget requirement for the installation of individual water meters is R1 000 000.

Item 5: Effective and Informative Billing System

Recommendation and Strategy:

- 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 continue with the commercial data analysis done 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 should continue with measures to keep the consumer bills informative and to improve on it.
  - Overstrand Municipality provides a moving 24 month water consumption graph on each account on a monthly basis. Hints on water usage are included on the accounts from time to time.
  - 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 R300 000.

Items 6 and 7: General Complaints System

Recommendation and Strategy:

Table C.5.3: Proposed WC/WDM Strategy Items for Overstrand Municipality
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 are 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: ➢ 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. The Customer Services Charter should include the following information: ➢ Commitment to deliver excellent services to our clients (Executive Mayor and Municipal Manager). ➢ Standards of services (Enquiries written and telephonic; Accounts enquiries and distribution of accounts). ➢ Response times for different services (Water: Repairs to networks, installation of new household water connections, etc.) ➢ Contact details for different areas.
Funding and Budget Requirements: Budget requirement for improved customer awareness raising with regard to the Municipality's Complaints System R150 000/annum.
Item 8: Asset Register for Water Infrastructure
Recommendation and Strategy: Continue to ensure that all the existing water and sewerage infrastructure are included in the Asset Register.
Funding and Budget Requirements: None - To be done as part of the annual updating of the Asset Register by the municipality.
Item 9: Asset Management Capital Works
Recommendation and Strategy: Allocate a budget of at least 2% of the total water asset value per annum towards the replacement of existing infrastructure. Municipality needs to differentiate in their capital budget between new projects and projects that are for the replacement of existing infrastructure, in order to accurately calculate the annual percentage allocated towards the replacement of existing infrastructure (Best Practice).
Funding and Budget Requirements: Capital budget of at least 2% of the total water and sewerage asset value allocated annually towards the replacement of the existing water and sewerage infrastructure (Best Practice).
Item 10: Asset Management Operation and Maintenance
Recommendation and Strategy: The municipality needs to continue to differentiate between the budget allocated towards the operation and maintenance of the water infrastructure and the budget allocated towards the replacement of the water and sewerage infrastructure. A budget of approximately 1% to 2% of the value of the system is typically required for the operations and maintenance of the system to ensure that the system remains in good condition (Best Practice). The municipality needs to compile an Asset Management Plan (AMP) to ensure efficient, effective and optimal management, operation and maintenance of all assets, which includes treatment plants, reservoirs, structures, buildings, pipelines, sites, etc. It is important for the municipality to develop an AMP from their Asset Register. The objective of an AMP is to support the achievement of the strategic goals of the Municipality and facilitate prudent technical and financial decision-making. It is also a vehicle for improved internal communication and to demonstrate to external stakeholders the Municipality's ability to effectively manage its existing infrastructure as well as the new infrastructure to be developed over the next 20 years. This plan must be based on the principle of preventative maintenance 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. The O&M Budget allocated towards repairs and maintenance should include the replacement of malfunctioning and old bulk water meters and consumer water meters, clearing of meter chambers, buying replacement mechanisms for bulk water meters, speedy repair of leaks, leak detection in areas with high water losses and NRW and higher than expected night flows, etc.
Funding and Budget Requirements: Municipality needs to continue to allocate adequate budget towards the repairs and maintenance of the existing water and sewerage infrastructure. A budget of approximately 1% to 2% of the value of the system is typically required for the operations and maintenance of the system to ensure that the system remains in good condition (Best Practice). An estimated budget for the drafting of an AMP for all the water and sewerage infrastructure is R750 000.
Item 11: Dedicated WC/WDM Support

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

Recommendation and Strategy:

The municipality should allocate at least one (1) person to head WC/WDM for a start. The number of people involved with WC/WDM measures can later be increased as and when required.

Funding and Budget Requirements:

The municipality may be able to use one of their existing staff members. If a new person has to be appointed the municipality can determine the costs involved with such an appointment.

Item 12: Active Leakage Control

Recommendation and Strategy:

The following process needs to be followed for active leakage control of the reticulation network:

Decide on how the work will be undertaken:

- 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.

The first three options need to include the purchase or re-allocation of equipment.

Leak detection: Identify areas with highest leaks and send teams into the field to detect leaks.

Repair of leaks once identified: Once leaks were detected they will need to be repaired. Depending on the extent of the leaks and other workloads, the leak repairs need to be carried out by either the internal teams or a contractor.

Funding and Budget Requirements:

R300 000 to undertake leak detection in zones with high excess night flows. In addition allocate approximately R200 000 per year for general visual leak inspections.

Item 13: Sectorization of Reticulation Systems

Recommendation and Strategy:

The billed metered data currently linked to the various water distribution systems should also be linked to the different reservoir zones in the future where possible, in order to accurately determine the NRW and water losses for the specific reservoir zones in the future. Faulty bulk water meters need to be replaced and new meters need to be installed for the reservoirs with no bulk water meters.

The 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:

- Clear indication of how much water is being used per area / zone.
- Areas with high NRW and water losses can easily be identified.
- Leakage and pressure control can be better managed.
- Water demand per area / zone can be determined.

Night flows need to be measured for zones with expected high water losses. It is recommended to re-log the night flows every few years to determine if there was an increase in leakage.

Funding and Budget Requirements:

The estimated cost for the logging of flows and pressures for zones with expected high water losses is R450 000. The logging exercise should be repeated at least every three years.

A budget should be allocated to investigate and resolve possible zone interconnections. It is however difficult to price such investigations at this stage.

Item 14: Effective Bulk Metering Management System

Recommendation and Strategy:

- Continue to read and record all the bulk water meter readings at the existing WTWs, reservoirs and pump stations on at least a weekly basis.
- Broken bulk water meters need to be repaired or replaced.
- Meter chambers need to be cleaned.
- 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 correctly installed. Ideally a straight pipe section upstream of the meter of at least 5x the meter diameter and 3x the meter diameter 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 weekly basis. The readings can be used to quantify both the water supplied and the leakage for a specific area.

Funding and Budget Requirements:

Allow an annual budget of approximately R350 000 for the installation of new bulk water meters, the replacement of faulty bulk water meters and to adequately protect existing bulk water meters.

Item 15: Effective Zone Meter Management and Assessment of Night Flows

Recommendation and Strategy:

See recommendations under Item “Effective Bulk Metering Management System” above.

Funding and Budget Requirements:

Table C.5.3: Proposed WC/WDM Strategy Items for Overstrand Municipality
See funding and budget requirements included under Item "Effective Bulk Metering Management System" above.
Item 16: Pressure Management
Recommendation and Strategy: The reticulation networks need to be divided into pressure zones, prior to implementing pressure management, and the pressures and flows need to be metered and logged. The activities of such a programme are as follows: • Undertake feasibility studies to determine the ranking of areas / projects (Desktop Study, Logging of pressures and flows, Analysis of data). • Implement advanced pressure management in areas identified (Design PRV Chambers, Pressure management implementation of new PRVs, Supply and installation of smart electronic pressure controllers for existing PRVs). • Impact assessment (Post pressure management logging to determine impact of new PRVs and / or installation of smart pressure controllers on existing PRVs). • The on-going operation, maintenance and optimisation of advanced pressure management installations.
Funding and Budget Requirements: Funding and Budget requirements for pressure management to be determined once a decision is taken on the further areas prioritised for pressure management (From recommended flow and pressure logging exercise).
Item 17: As-built Drawings of Bulk and Reticulation Infrastructure
Recommendation and Strategy: Continue with the current record system for all "as-built" drawings and the regular updating of the Water and Sewer Master Plans with this information.
Funding and Budget Requirements: The Municipality currently adequately budgeted for the updating of their Water and Sewer Master Plans with the most recent "As-built" drawings.
Item 18: Schematic Layouts of Water Reticulation Systems
Recommendation and Strategy: Municipality needs to continue to update the schematic layouts and the Aerial Maps 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 updated Water Supply and Sanitation Services By-law needs to be enforced and adequate human resources need to be allocated for this purpose.
Funding and Budget Requirements: No additional budget and funding requirements.
Item 20: Tariffs
Recommendation and Strategy: See Section 7.3 under Topic 7 of the Future Demand and Functionality Requirements WSDP Report.
Funding and Budget Requirements: None
Item 21: Technical Support to Customers
Recommendation and Strategy: The objective of a Technical Support programme is not limited to assisting consumers in reducing their water demand, but is also to look at wastewater, monitor compliance with by-laws and service conditions and offer general customer support. Once a dedicated person has been allocated to WC/WDM it is recommended to engage with large customers and to identify areas where the municipality can provide assistance. The proposed activities of this programme that can be budgeted for are as follows: • Train existing staff; • Identify and visit large consumers (Checking that large consumers are correctly metered and billed, providing tips on WC/WDM, test the accuracy of all large consumer meters, install data-loggers on all large consumer meters and informing consumers of any sudden change in consumption patterns). • Arrange leakage inspections in public 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: Meters need to be installed at the estimated 409 unmetered erven, as identified through the 2021 Swift analyses.
Funding and Budget Requirements: Estimated budget of R1.227 million is required to install water meters at the unmetered erven.
Item 23: Community Awareness on WDM

Table C.5.3: Proposed WC/WDM Strategy Items for Overstrand Municipality
Recommendation and Strategy:
See Section 5.1.3 of the Future Demand and Functionality Requirements WSDP Report.
Funding and Budget Requirements:
It is estimated that R250 000 / year should be allocated for WC/WDM awareness campaigns and activities, material to be included with monthly water bills, placing notices in newspapers, billboards, competitions, etc.
Item 24: Schools Education on WDM
Recommendation and Strategy:
See Section 5.1.3.1 of the Future Demand and Functionality Requirements WSDP Report.
Funding and Budget Requirements:
Continue with the current schools education programme in Overstrand Municipality. The DWS can also assist the municipality with pamphlets and posters on WC/WDM initiatives.
Item 25: Retrofitting
Recommendation and Strategy:
See Sections 5.1.2.1 and 5.1.2.2 of the Future Demand and Functionality Requirements WSDP Report.
Funding and Budget Requirements:
Leak repair assistance programmes: R400 000 per annum for ongoing exercise to repair leakages at indigent properties using in excess of 18 kl/month. WSIG funding or "War on Leaks" funding from DWS can be requested in this regard.

The way forward for Overstrand 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.

Overstrand 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 Overstrand Municipality's capital and operational 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 Overstrand 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.

Overstrand Municipality has responded to the need to address NRW and water losses within their jurisdiction by implementing various WC/WDM initiatives. The Municipality will continue with the active implementation of their WDM Strategy and Action Plan in order to reduce the percentage of NRW and Water Losses and improve water use efficiency within the various schemes as follows.

Table C.5.4: Commitment to Reduce NRW (Include Bulk Distribution, Treatment and Internal Distribution)

Distribution System	2020/2021		Committed Future NRW	
	NRW (%/a)	Water Losses (%/a)	2025 (%/a)	2045 (%/a)
Buffels River	50.60%	43.66%	45.0	30.0
Kleinmond	35.94%	35.15%	30.0	25.0
Greater Hermanus	23.88%	23.54%	20.0	15.0
Stanford	26.28%	25.76%	23.0	15.0
Greater Gansbaai	23.89%	23.50%	20.0	15.0
Pearly Beach	29.81%	29.31%	25.0	20.0
Baardskeerdersbos	52.31%	52.00%	45.0	30.0
Buffeljags Bay	53.68%	53.19%	45.0	30.0

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 Overstrand 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.

The current water balance information database is adequate from a water services management perspective and Overstrand Municipality is committed to continue to record all flows, both water and sewerage, that are strategic in terms of medium and long term planning. Overstrand Municipality is committed to keep record of all bulk meter readings, flows at WWTWs and to continue to update their IWA water balance models on a monthly basis in order to determine locations of wastage and to enable Overstrand Municipality to actively implement the WC/WDM Strategy in order to reduce their current NRW and water losses even further. The water balance will not directly lead to the reduction of the demand, but is an imperative management tool that will inform the implementation of demand side management initiatives.

Overstrand Municipality needs to focus on the following for the IWA water balances of all the systems.

- Continue to use IMQS (Swift analysis) to identify treasury records that cannot be linked to GIS data, occupied stands with water meters, but with no water demand, occupied stands with no water meters, occupied stands with very low consumption and stands where the water demands have reduced or increased substantially in recent months.

The following areas need to be focused on for the IWA water balances of each of the systems.

- Buffels River: Quantify the monthly volume of effluent discharged at the Kleinmond WWTW from Betty's Bay, Pringle Bay and Rooi Els.

- Kleinmond: Install final effluent flow meter at the Kleinmond WWTW.

- Greater Hermanus:
  - Sum of monthly abstraction volumes per individual borehole for the Gateway, Camphill and Volmoed wellfields to be monitored against the total supply volume at the WTW, in order to identify any potential bulk raw water distribution losses.
  - Groundwater abstraction volumes per individual borehole to be included in water balance model, in order to monitor abstraction volumes against safe yields of boreholes and licence volumes (Results from current Groundwater Monitoring Programme to be incorporated where possible).
- Stanford: Repair vandalised cables and display unit of the Magflow meter at the balancing tank.
- Greater Gansbaai: Adequate
- Pearly Beach:
  - Calibrate Koekemoer and Pearly Beach inflow meters at the Pearly Beach WTW, because the inflow at the plant was less than the outflow (System Input Volume) for the 2020/2021 financial year.
  - Calibrate raw water meters at the Koekemoer and Pearly Beach dams, in order to accurately calculate the bulk raw water distribution losses between the dams and the treatment plant.
- Baardskeerdersbos: Adequate
- Buffeljags Bay: Calibrate borehole meter and meter at reservoir, because raw water abstraction volume is less than the system input volume for the last two financial years.

Non-Revenue Water and Water Losses:

Buffels River: The treatment losses for the WTW for the last financial year was very low, which is excellent. The Municipality needs to keep the treatment losses below a target of 10%. The NRW and Water Losses are extremely high and stayed roughly the same for the last two financial years. The Municipality can work towards a target of 45% for the NRW and 35% for the Water Losses for the next five years. The ILI of 3.44 indicates a good management system, which should be monitored carefully.

Kleinmond: The current treatment losses for the WTW are acceptable. The NRW and Water Losses are still high and stayed roughly the same for the last two financial years. The Municipality can work towards a target of 30% for the NRW and Water Losses for the next five years. The ILI of 3.11 indicates a good management system, which should be monitored carefully.

Greater Hermanus: The current treatment losses for the Preekstoel WTW and the Biological WTW are acceptable. The raw water volumes supplied from the different raw water pipelines to consumers, as well as the volume of treated effluent re-used by consumers were included with the billed metered consumption figures for the years up to 2019/2020, which were incorrect, therefore the lower NRW and Water Losses for the period up to 2019/2020. The NRW and Water Losses for the 2020/2021 financial year were therefore higher, but are still at acceptable levels according to the DWS (Less than 30%). The Municipality can however work towards a target of 20% for the NRW and Water Losses for the next five years. The ILI of 2.23 indicates a good management system, which should be monitored carefully.

Stanford: The current treatment losses for the ultrafiltration and RO plant is high and the Municipality needs to work towards a target of 25% for the treatment losses. The NRW and Water Losses came down during the last financial year and are at acceptable levels according to the DWS (Less than 30%). The Municipality can however work towards a target of 23% for the NRW and Water Losses for the next five years. The ILI of 2.27 indicates a good management system, which should be monitored carefully.

Greater Gansbaai: The current treatment losses for the Franskraal WTW and the De Kelders ultrafiltration and RO plant are acceptable. The NRW and Water Losses came down during the last financial year and are at acceptable levels according to the DWS (Less than 30%). The Municipality can however work towards a target of 20% for the NRW and Water Losses for the next five years. The ILI of 2.26 indicates a good management system, which should be monitored carefully.

Pearly Beach: The treatment losses for the WTW for the last financial year was very low, which is excellent. The NRW and Water Losses stayed roughly the same for the last two financial years and are at acceptable levels according to the DWS (Less than 30%). The Municipality can however work towards a target of 25% for the NRW and Water Losses for the next five years. The Municipality needs to keep the treatment losses below a target of 10%. The ILI of 1.26 indicates an excellent management system, with no specific intervention required.

Baardskeerdersbos: The current treatment losses for the WTW are acceptable. The NRW and Water Losses are extremely high and increased even further during the last financial year. The Municipality needs to work towards a target of 45% for the NRW and Water Losses for the next five years. The ILI of 2.35 however indicates a good management system, which should be monitored carefully.

Buffeljags Bay: The NRW and Water Losses increased drastically during the last financial year and the reason for this should be investigated. The Municipality needs to work towards a target of 45% for the NRW and Water Losses for the next five years. The ILI of 33.80 indicates a poor management system, which requires attention.

TOPIC 6: WATER RESOURCES

Topic C.6.1: Water Resource						
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	No	100.0				100.0
Additional Sources Available	Yes	100.0	Continue with the further augmentation of the Greater Hermanus water resources.	100.0	Yes	92.9
Monitoring	Yes	100.0	Ensure that all industries apply for the discharge of industrial effluent into the sewer system, to monitor the quality and volume of industrial effluent discharged and to implement the set of by-laws with regard to the discharge of industrial effluent into Overstrand Municipality's sewer system in order to determine whether the quality comply with the standards and criteria.	100.0	Yes	57.1
Water Quality	No	100.0				100.0
Operation	Yes	100.0	Ensure all surface and groundwater resources are registered with the DWS.	100.0	Yes	92.9

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?

Groundwater sources were developed successfully in Hermanus, Stanford, Baardskeerdersbos and Buffeljags Bay, resulting in a significant reduction in the Municipality's dependence on surface water sources. The drilling of two additional productions boreholes for Hermanus was completed at Gateway during 2020, with the expansion of the well fields in the Hemel-en-Aarde Valley planned for the near future. In the medium term (5 to 10 years), a seawater desalination scheme is planned for the Greater Hermanus area, to assist in providing for the future water needs of the growing population.

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. Overstrand Municipality needs to continue with the monthly reading of all their existing bulk water meters, which is a valuable source of information.

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

Detail future water requirement projection models were developed for each of the distribution systems in Overstrand Municipality's Management Area. These models include the future projections up to 2045 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 future water requirement projections for the various distribution systems and the yield / licence volume surplus or shortfall, based on the WSDP projection.

Table C.6.2: Projected Future Water Requirements and Yield / Licence Surplus (+) / Shortfall (-) based on WSDP Model

Distribution System	Projection	PROJECTED FUTURE WATER REQUIREMENTS (Ml/a)				
		2025	2030	2035	2040	2045
Buffels River	2.5% Annual Growth	874.297	989.187	1 119.174	1 266.242	1 432.637
	3.5% Annual Growth	917.786	1 090.042	1 294.627	1 537.611	1 826.200
	WSDP Model	**844.061**	**956.217**	**1 092.467**	**1 257.882**	**1 458.769**
	Yield surplus (+) / shortfall (-)	**+872.939**	**+760.783**	**+624.533**	**+459.118**	**+258.231**
Kleinmond	2.5% Annual Growth	996.080	1 126.974	1 275.067	1 442.622	1 632.194
	3.5% Annual Growth	1 045.627	1 241.877	1 474.960	1 751.790	2 080.577
	WSDP Model	**919.325**	**1 038.015**	**1 175.976**	**1 336.750**	**1 524.602**
	Yield surplus (+) / shortfall (-)	**+1 670.045**	**+1 551.355**	**+1 413.394**	**+1 252.620**	**+1 064.768**
Greater Hermanus	3.0% Annual Growth	4 917.871	5 701.161	6 609.208	7 661.883	8 882.223
	4.0% Annual Growth	5 161.284	6 279.491	7 639.961	9 295.180	11 309.008
	WSDP Model	**5 021.287**	**6 122.660**	**7 502.130**	**9 235.016**	**11 417.750**
	Licence surplus (+) / shortfall (-)	**+978.713**	**-122.660**	**-1 502.130**	**-3 235.016**	**-5 417.750**
Stanford	2.5% Annual Growth	505.187	571.573	646.683	731.662	827.808
	3.5% Annual Growth	530.316	629.849	748.063	888.465	1 055.217
	WSDP Model	**516.170**	**611.490**	**726.952**	**866.970**	**1 036.949**
	Licence surplus (+) / shortfall (-)	**+ 1 083.830**	**+988.510**	**+873.048**	**+733.030**	**+563.051**
Greater Gansbaai	3.0% Annual Growth	1 701.601	1 972.622	2 286.810	2 651.039	3 073.281
	4.0% Annual Growth	1 785.823	2 172.726	2 643.454	3 216.166	3 912.957
	WSDP Model	**1 693.131**	**2 040.607**	**2 474.407**	**3 017.923**	**3 701.120**
	Yield surplus (+) / shortfall (-)	**+1 074.850**	**+727.374**	**+293.574**	**-249.942**	**-933.139**
Pearly Beach	2.5% Annual Growth	173.565	196.373	222.178	251.374	284.406
	3.5% Annual Growth	182.198	216.394	257.009	305.246	362.536
	WSDP Model	**179.333**	**221.665**	**275.847**	**345.443**	**435.126**
	Yield surplus (+) / shortfall (-)	**+127.567**	**+85.235**	**+31.053**	**-38.543**	**-128.226**
Baardskeer-dersbos	2.5% Annual Growth	20.072	22.710	25.694	29.071	32.891
	3.5% Annual Growth	21.071	25.025	29.722	35.301	41.926
	WSDP Model	**16.026**	**15.560**	**15.221**	**15.002**	**14.904**
	Licence surplus (+) / shortfall (-)	**+43.974**	**+44.440**	**+44.779**	**+44.998**	**+45.096**
Buffeljags Bay	2.5% Annual Growth	6.652	7.526	8.515	9.633	10.899
	3.5% Annual Growth	6.982	8.293	9.849	11.698	13.894
	WSDP Model	**5.122**	**4.991**	**4.905**	**4.865**	**4.873**
	Yield surplus (+) / shortfall (-)	**+23.260**	**+23.392**	**+23.477**	**+23.517**	**+23.510**

The table below gives an overview of the years in which the annual water requirements are likely to exceed the sustainable yields / license volumes from the various resources.

Table C.6.3: Years in which the Annual Water Requirement will Exceed the Sustainable Yields / License Volumes from the Various Resources

Distribution System	Total Sustainable Yield (Y) / License Volume (L) (x 10^6 m^3/a)	Annual Growth on 2020/2021 requirement (2.5% or 3%)	Annual Growth on 2020/2021 requirement (3.5% or 4%)	WSDP Projection Model
Buffels River	1.717 (Y)	> 2045 (2.5%)	2043 (3.5%)	> 2045
Kleinmond	2.589 (Y)	> 2045 (2.5%)	> 2045 (3.5%)	> 2045
Greater Hermanus	6.000 (L) *	2031 (3.0%)	2028 (4.0%)	2029
Stanford	1.600 (L)	> 2045 (2.5%)	> 2045 (3.5%)	> 2045
Greater Gansbaai	2.768 (Y)	2041 (3.0%)	2036 (4.0%)	2037
Pearly Beach	0.307 (Y)	> 2045 (2.5%)	2040 (3.5%)	2037
Baardskeerdersbos	0.060 (L)	> 2045 (2.5%)	> 2045 (3.5%)	> 2045
Buffeljags Bay	0.028 (Y)	> 2045 (2.5%)	> 2045 (3.5%)	> 2045

Note * With Gateway, Camphill and Volmoed Well Fields fully operational according to the licensed volumes.

Overstrand Municipality continues with their groundwater monitoring programmes for Hermanus (Gateway and Hemel & Aarde Wellfields), Stanford and Baardskeerdersbos. **The water resources for the different systems are all considered to be adequate for the projected population and future growth until at least 2035, except for the Greater Hermanus system, where additional sources will have to be developed within the next 5 to 10 years to satisfy the growing demand.**

The DWS is currently busy with the updating of the All Towns Reconciliation Strategies for the Western Cape. The table below gives an overview of the recommended potential future water resources, as included in the 2015 All Towns Reconciliation Strategies, for the towns in Overstrand Municipality (**Additional comments by Municipality**).

Table C.6.4: Potential Future Water Resources for the Towns (Summary of DWS's All Towns Reconciliation Strategies)

Distribution System	Recommended Summary Options
Betty's Bay, Rooi Els and Pringle Bay	**The current water sources have adequate supply to cater for the medium and longer term future water requirements. The following sources are identified as potential sources to augment the water supply (In order of priority and implementation sequence):** • Continue with the implementation of the WC/WDM Strategy and measures. • Groundwater development in the TMG Aquifer. • Raising of Buffels River dam wall • Abstraction from the Palmiet River • Abstraction from the Rooi Els River
Kleinmond	**The current water sources have adequate supply to cater for the medium and longer term future water requirements. The following sources are identified as potential sources to augment the water supply in the future if required (In order of priority and implementation sequence):** • Continue with the implementation of the WC/WDM Strategy and measures. • Increase allocation from the Palmiet River, when required. • **Regional scheme with Overberg Water for possible bulk supply from the Theewaterskloof Dam.**
Hermanus	**Hermanus will experience a shortfall by 2030 in water supply under all growth scenarios. This will increase to 2.874 million m^3/a by 2040 under the low-growth scenario and to 8.632 million m^3/a under the high-growth scenario. The following sources are identified as potential sources to augment the water supply in the future if required (In order of priority and implementation sequence):** • Full implementation of the WC/WDM Strategy and measures. • **Develop groundwater to its full potential (Licenced volumes).** • Regional scheme with Overberg Water for possible bulk supply from the Theewaterskloof Dam or the Palmiet River. • Direct and indirect potable water re-use. • Desalination of seawater.
Stanford	**The current water sources have adequate supply to cater for the medium and longer term future water requirements, if the Municipality continues with the full implementation of their WC/WDM Strategy. The following sources are identified as potential sources to augment the water supply in the future (In order of priority and implementation sequence):** • Continue with the implementation of the WC/WDM Strategy and measures.

Table C.6.4: Potential Future Water Resources for the Towns (Summary of DWS's All Towns Reconciliation Strategies)	
Distribution System	**Recommended Summary Options**
	• Further Kouevlakte Wellfield development, if required.
Greater Gansbaai	**The current water sources have adequate supply to cater for the medium and longer term future water requirements. The Kraaibosch Dam will provide for Gansbaai until ~~2030~~ 2037. The following sources are identified as potential sources to augment the water supply in the future if required (In order of priority and implementation sequence):** • Continue with the implementation of the WC/WDM Strategy and measures. • Groundwater development in the TMG Aquifer. • Re-use of water
Pearly Beach	**The current water sources have adequate supply to cater for the medium and longer term future water requirements up to ~~2030~~ 2037. The following sources are identified as potential sources to augment the water supply in the future if required (In order of priority and implementation sequence):** • Continue with the full implementation of the WC/WDM Strategy and measures. • Groundwater development, if required.
Baardskeer-dersbos	**The current water sources have adequate supply to cater for the medium and longer term future water requirements. If the town may require alternative water resource options in the future, the following sources were identified as potential sources to augment future water requirements (In order of priority and implementation sequence):** • Continue with the full implementation of the WC/WDM Strategy and measures. • Further groundwater development, if required.
Buffeljags Bay	**The current water sources have adequate supply to cater for the medium and longer term future water requirements. If the town may require alternative water resource options in the future, the following sources are identified as potential sources to augment future requirements (In order of priority and implementation sequence):** • Continue with the full implementation of the WC/WDM Strategy and measures. • Further groundwater development, if required.

Buffels River and Kleinmond Areas: Overstrand Municipality completed a detail investigation during 2010/2011 of the water resources for the area from Rooi Els to Kleinmond and the recommendations from the Study will be implemented.

Greater Hermanus Area: The Gateway, Camphill and Volmoed wellfields were developed by Overstrand Municipality as additional groundwater resources for the greater Hermanus Area. These boreholes are in production and the Municipality is maintaining their Groundwater Monitoring Programmes for all their wellfields, in order to comply with the License conditions. The License for the next phase of the Camphill and Volmoed wellfields was also received from the DWS. The Municipality is currently busy with the augmentation of the Hermanus (Camphill and Volmoed well fields) boreholes.

A Scoping Report was also completed during August 2018 for the "Augmentation of potable water supplies to Hermanus". The report discusses various potable water augmentation schemes for the provision of 3 Ml/d of potable water to Hermanus. The following augmentation schemes were considered:

- Seawater reverse osmosis.
- Desalination-based direct reuse scheme.
- Non-desalination based direct reuse scheme.
- Remix scheme.
- Palmiet River abstraction and transfer scheme.
- Aquifer recharge.

In considering various potable water augmentation schemes for Hermanus, the following conclusions were made:

- Managed aquifer recharge does not seem to be a viable water augmentation solution for Hermanus as the process required to render the reclaimed wastewater suitable for aquifer recharge will be very similar to that of a direct potable water reuse scheme. This makes the option particularly unattractive due to the relatively high treatment costs which would be further compounded by the additional cost of abstracting the water and treating for consumption at a later date. On this basis, it will be better to rather implement a direct potable water reuse scheme before aquifer recharge is considered. In addition, the shallow water levels of the porous media aquifer in the area indicate that the aquifer will be unable to accept the required yield and there is a risk of flooding due to the limited available volume of unsaturated sands;

- The basis of financially ranking the various treatment options will be the cost of delivering a unit volume of treated water. Based on this criterion, abstraction of water from the Palmiet River seems to be most feasible option with a treated water delivery cost of R9.61/m^3 and a capital cost of ~R99,5 million. Included in the treated water delivery cost is the cost of treatment at Preekstoel WTW, which was estimated at R2.50/m^3. Of particular concern to the implementation of such a scheme is the reliability of this water source as the Palmiet river flow is too low during the summer months to accommodate the required 3.6 Ml/d of abstracted water. In addition to the possibility of inadequate water supply, the pipeline route from the abstraction point to the De Bos dam covers extremely sensitive environmental areas and the need to route the pipeline through the coastal town of Kleinmond. Environmental & public approval for construction of such a pipeline may well be a stumbling block for implementation of this option. In addition, a new Water Use License Application (WULA) may well also be required for this option, while it will trigger a need for environmental authorisation from the Department of Environmental Affairs and Development Planning (DEA & DP). The latter will be difficult to obtain;

- Seawater desalination is the second most feasible solution with a treated water delivery cost of R16.10/m^3 and a capital cost of ~R88.5 million. However, there is an additional surcharge cost that Abagold may charge for using their facilities, which is unknown at this moment. This cost may be charged per volume of abstracted water or as a flat cost, but this is still to be determined. Therefore, Overstrand Municipality will have to discuss this with Abagold and come to an agreement. Once this cost is determined, it will have to be added to the R16.10/m^3 operating cost figure of the seawater desalination process to determine the real cost of this scheme. From an environmental perspective, this option will require an amendment to Abagold's Coastal Water Discharge Permit (CWDP) for brine disposal, while it will trigger a need for environmental authorisation from the Department of Environmental Affairs and Development Planning (DEA & DP);

- The non-desalination-based reuse scheme has a capital cost of ~R122.5 million and an operating cost of R19.45/m^3. This cost could however be reduced if the reclaimed water is not pumped to the Preekstoel WTW for re-treatment via the Preekstoel WTW but rather introduced directly into the reticulation system via the Hermanus Reservoirs 1 & 2, similar to the desalination-based re-use scheme. If so, the capital cost would reduce to ~R118.5 million with an operational cost of R16.35/m^3. This could make it the most feasible scheme after the Palmiet River abstraction option. From a water quality perspective, the treated water from the non-desalination-based reuse scheme will comply with potable water standards, but the salinity will be on the high side. For this reason, blending with an alternative low salinity water source is recommended. Provided that the public perception of the potential risks associated with the elimination of a RO plant barrier as part of the treatment process can be addressed, the water does not require additional treatment and can be directly introduced into the reticulation system. The option of feeding the water to the Preekstoel WTW was preferred based on the fact that part of the pipeline was already constructed and further knowing that the additional barriers at Preekstoel WTW will give further comfort to the negative stigma of water reuse. From an environmental perspective, the reuse scheme options will require an amendment to Overstrand's Coastal Water Discharge Permit (CWDP), while it will trigger the need for environmental authorisation from the Department of Environmental Affairs and Development Planning (DEA & DP);

- The desalination-based reuse scheme requires a capital investment of ~R151 million and an operating cost of R21.53/m^3. The operational cost would increase with ~R3.00/m^3 to R24.53/m^3 if the water cannot be introduced into the Hermanus reservoirs 1 & 2 but is pumped to the Preekstoel WTW for introduction into the balancing reservoir at Preekstoel. From an environmental perspective, the desalination-based reuse scheme option will require an amendment to Overstrand's Coastal Water Discharge Permit (CWDP), while it will trigger a need for environmental authorisation from the Department of Environmental Affairs and Development Planning (DEA & DP);

- Despite having a slightly lower capital cost (~R147 million) than the desalination-based reuse scheme, the Remix scheme is the most expensive scheme to operate at R21.77/m^3. The operational cost would increase further with ~R3.00/m^3 to R24.77/m^3 if the treated water is not introduced into the Hermanus reservoirs 1 & 2 but rather pumped to the Preekstoel WTW for introduction into the balancing reservoir at Preekstoel. From an environmental perspective, the remix scheme option will require an amendment to Overstrand's Coastal Water Discharge Permit (CWDP), while it will trigger a need for environmental authorisation from the Department of Environmental Affairs and Development Planning (DEA & DP);

- The Hermanus wastewater treatment plant site assessment has identified the need for maintenance activities on certain components of the wastewater treatment plant. When considering a reuse scheme, the need to undertake maintenance on the wastewater treatment plant that feeds the reuse plant should also be considered as part of the capital outlay for a reuse scheme as the latter would rely on a stable source water supply. The site assessment undertaken by Aurecon has identified the need to spend at least ~R17 million on maintenance activities. Whilst one can argue that maintenance on the wastewater treatment plant would be required in any event, it would not be that critical if the wastewater is discharged to sea. A reuse plant on the other hand relies on a stable quality water and without a proper functioning wastewater treatment plant, it would not be an option to consider.

- It was recommended that a further investigation is undertaken to explore the feasibility of utilising renewable energy as a potential energy source to support a seawater desalination plant. This would be the only way to reduce the operation cost of a SWRO plant. Some of the available renewable energy technologies have already been tested in Hermanus and although there is not excess energy available for the desalination or reuse plants from these sources, it is worth looking into it as a potential source (or partial source). There has also been significant technology development in harvesting wave energy and if such a system can be installed, SWRO may well just prove to be a very cost-effective solution for Hermanus;

- A reliable seawater quality dataset was not received from Abagold although Abagold indicated that they would be willing to share their information with the Consultant in the interest of the study. Overstrand Municipality also completed a separate seawater sampling program covering all 4 seasons to confirm the design parameters for a SWRO plant.

The following additional work was completed during October 2019, after the completion of the previously mentioned "Augmentation of potable water supplies to Hermanus" Scoping Report.

- Sea water quality tests.
- Renewable energy options.
- Electricity cost sensitivity analysis.
- Contracting modes.
- Recommended water price plan.
- Suitability of earmarked SWRO site.

Stanford: The Municipality explored the groundwater potential of the Kouevlakte area since 2009, through exploration borehole siting and drilling. Two newly drilled boreholes were put into operation and new bulk supply pipelines were constructed during the 2011/2012 financial year in order to connect the two newly drilled boreholes to the existing water reticulation network. Irrigation of sports fields with treated effluent from the Stanford WWTW was also investigated. The current supply from the Spring and the two boreholes are adequate to meet the medium- and long-term future water requirements of Stanford.

Greater Gansbaai: A Reverse Osmosis Filtration Plant was constructed during the 2010/2011 financial year in order to fully utilise the Klipgat and Grotte resources and improve the quality of the water. Resource augmentation options will be investigated in the future in order to meet the medium- and long-term future water requirements for the greater Gansbaai area.

Pearly Beach: Overstrand Municipality is committed to manage the dam efficiently. Other future resource options include groundwater development and the possible Kraaibosch scheme.

Baardskeerdersbos: Two boreholes were commissioned and the supply from these boreholes will be adequate to meet the medium- and long-term future water requirements. The supply from the stream will only be utilised as a back-up supply when necessary.

Buffeljags Bay: The current supply from the borehole is adequate to supply the medium- and long-term future water requirements of Buffeljags Bay.

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

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

Table C.6.5: 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.

Comprehensive Compliance Sampling Programmes are also implemented for all the WTWs and water distribution systems.

Effluent Quality: Comprehensive Operational and Compliance Sampling programmes of the wastewater at the WWTWs are implemented by Overstrand Municipality. The Compliance Monitoring Programme includes the monthly sampling of the final effluent at the various WWTWs and analyses of all the main quality criteria. Results of the samples taken are loaded onto DWS's IRIS system. Monthly monitoring and inspection reports are also compiled by the external Service Provider for all the WWTWs. The Municipality and the Contractor appointed for the Water and Waste Water Bulk Works Contract takes immediate action to rectify problems and / or improve operational aspects as and when may be required. For serious failures, an Incident Response Management Protocol is followed to ensure rapid remedying of the problems, which includes notification to the DWS as may be necessary.

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

Industrial Consumers: All industrial consumers need to formally apply for the discharge of industrial effluent into the sewer system. The Municipality is currently busy with the updating of their Water Supply and Sanitation Services By-law. The updating includes the reviewing of the charges that need to be paid by the industrial consumers for the quality of final effluent discharged into the municipality's sewer system by them. The Municipality liaise with the industrial consumers as and when required with regard to the quality of final effluent discharged by them.

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

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

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

TOPIC 7: FINANCIAL

The 2021/2022 IDP list the following key long term financial considerations to be considered by Overstrand Municipality in order to remain financially sound.

- The historic, and still real challenge is to accommodate the divergent needs of the different communities and still promote tourism. This challenge manifests itself in a number of ways, including the need to provide a high level of service and create quality infrastructure which is only used to its full capacity during peak but short holiday periods but also as a challenge the affordability concern of retirees whose income in real terms is declining, and indigents who cannot afford to pay for the high level of service.

- The Municipality has installed infrastructure that provides a high level of service to its residents. This speaks to the relatively low levels of backlogs. It needs to be emphasized however that the high level of service infrastructure does imply that asset management requires significant budgetary allocations to repair and maintain as well as replacement of infrastructure at the appropriate time in the future.

- The National State of Disaster: Covid-19 as declared in March 2020 and the subsequent national lockdown since end of March 2020 resulted in a very severe impact on the economy and many households' income. Municipalities are thus still at risk of an increase in outstanding debtors.

- Given the current economic climate referred to, as well as the completion of housing projects on an ongoing basis, an increase in the number of indigent households is expected over the MTREF.

- Indigent households receive 6 kl of water and 50 units of electricity free per month. The Municipality anticipates that the number of indigents will increase over the next 3 years to at least 8 000 households in 2023/24.

- The Municipality must be mindful of under spending on the capital budget on an annual basis. Specific emphasis must be given to grant funded expenditure. The Municipality started with the compilation of a long term Capital Expenditure Framework in co-operation with the Western Cape Province.

- The affordability of tariff increases for the community at large is of great importance to the municipality and the level of services versus the associated cost is a constant consideration at executive management- and Budget Steering Committee level.

- It thus remains relevant that, with the risk of subsequent waves of the Covid-19 pandemic a reality, an extremely challenging task of balancing the cost of providing basic services to the residents of the Overstrand, as well as tourists to the area, has to be managed with the income the Municipality is able to generate from these services.

A Long Term Financial Plan is in place for Overstrand Municipality, which is updated annually since 2015 with the latest financial information. The independent financial assessment list the following strengths and weaknesses (2021/2022 IDP).

Strengths:

- Overstrand Municipality has a proven ability to generate cash from operations despite experiencing total operating deficits (Excl. capital grants) between 2013 and 2016.

- A high liquidity ratio of 2.75 in 2020, supported by an increased cash and cash equivalents balance, suggesting that the municipality will be able to service its liabilities as and when it becomes due. Though it has to be mentioned that the liquidity ratio has declined from the previous year.

- Strong Consumer Debtors aging profile and a high 97% Consumer Debtors Collection Rate, improving the ability of the municipality to translate accounting surpluses into operating cash (however dependent on future COVID-19 impact on outstanding Debtors).

- Low level of grant dependency.

Weaknesses:

- Absence of a Capital Asset Replacement Reserve to address the risk of unexpected future increases in capital requirements due to low levels of repairs and maintenance and/or capital spend (however, a different approach followed by the municipality).

- The sustained pressure that staff costs is placing on operating expenditure, comprising 33% of total operating expenditure.

- Above National Treasury norm guideline value for debtors' days. Not currently a threat, but if not managed properly may result in potential cashflow challenges.

- Higher reliance on cash and reserves in capital funding mix contribute to the declining liquidity ratio.

The table below gives an overview of the Financial Strategies of Overstrand Municipality to ensure sound financial management over the medium to long term (2021/2022 IDP).

Table C.7.1: Financial Strategies

Strategy	Status of the Strategy
Revenue Raising Strategies	The Municipality's revenue streams will be maximised: • Assessment rates; • Revenue from trading services; • Agency fees and fines; • Sundry revenue e.g. property management and other revenue; • Grants; • Donor funding from international agencies; • Public Private Partnership; and • Applying strict credit control measures.
Asset Management Strategies	• Asset conservation and supply of basic services as a constitutional obligation. • Ensure that assets are properly accounted for and safeguarded, as averaging on the municipal assets will drive the economic growth and development of the Municipality.

Table C.7.1: Financial Strategies	
Strategy	**Status of the Strategy**
Financial Management Strategies	• Compliance with GRAP standards; • Prepare annual financial statements timeously; • Compliance with the municipal Standard Chart of Accounts; • Maintain an effective financial management system, to ensure proper reporting; • Sustainable multi-year forecasts.
Capital Financing Strategies	Municipal infrastructure has a long term economic life and the general principle will be applied that future users of infrastructure should contribute towards the payment for capital expenditure by servicing the loans taken up to provide adequate infrastructure as required. • Overstrand will maintain its process of utilizing the following main sources of financing to fund CAPEX, e.g. Grants, External Borrowing and Internal Revenue generated. • Bulk infrastructure contributions as might be available, to fund applicable capital projects.
Operational Financing Strategies	• Business planning links back to priority needs and master planning, and informs the detail operating budget appropriations. • Consideration of the economic realities and the subsequent prioritisation criteria for compilation of the Operational budget. • Requirement of Top Management to discuss budget proposals and affordability.
Strategies that would enhance cost effectives	• Further operational efficiencies to be identified. • Reduction in non-core expenditure and consideration of reviewing service levels standards.

Overstrand Municipality's KPA 3 is "Optimizing Financial Resources" and the Strategy is "Effective Financial Management". The draft 2020/2021 Annual Report indicated that the Municipality has already implemented the following financial management reforms to ensure that resources are used efficiently.

- Efficient costing of services and projects by identifying and managing the cost drivers, inclusive of a sustained focus on cost containment, also in view of the promulgation of the Municipal Cost Containment Regulations on 7 June 2019 by the Minister of Finance, in concurrence with the Minister of Cooperative Governance and Traditional Affairs, in an attempt to "ensure that resources of a municipality and municipal entity are used effectively, efficiently and economically".
- Active use of forecasts and projections to manage cash flow efficiently.
- Active monitoring of income and expenditure against pre-determined budget targets/projections.
- Set financial benchmarks and monitor performance against them.
- Development of a feasible capital funding strategy.
- Development of a feasible cash and investment strategy.
- Exploring additional funding sources.

Expenditure:

Operational: The future planned expenditure by type for Overstrand Municipality, as included in the approved 2021/2022 Budget, is as follows.

Table C.7.2: Expenditure Items by Type, as Included in the Approved 2021/2022 Budget					
Expenditure Items	**% of total 2020/2021 Expenditure**	**2020/2021 Full Year Forecast**	**2021/2022 Budget**	**2022/2023 Budget**	**2023/2024 Budget**
Employee related costs	32.79%	R441 242 000	R463 803 000	R482 942 000	R504 312 000
Remuneration of Councillors	0.88%	R11 896 000	R12 401 000	R12 905 000	R13 432 000
Debt Impairment	1.95%	R26 263 000	R21 500 000	R21 500 000	R21 500 000
Depreciation and Asset Impairment	10.54%	R141 877 000	R145 663 000	R144 047 000	R143 381 000
Finance Charges	3.83%	R51 482 000	R51 804 000	R51 923 000	R52 180 000
Bulk Purchases	20.09%	R270 260 000	R353 706 000	R385 187 000	R419 468 000
Other Materials	3.97%	R53 437 000	R44 845 000	R47 274 000	R48 918 000
Contracted Services	16.71%	R224 809 000	R247 340 000	R251 832 000	R272 718 000
Transfers and Grants	0.65%	R8 680 000	R12 324 000	R12 557 000	R13 060 000
Other Expenditure	8.59%	R115 613 000	R141 620 000	R124 893 000	R111 643 000

Table C.7.2: Expenditure Items by Type, as Included in the Approved 2021/2022 Budget					
Expenditure Items	**% of total 2020/2021 Expenditure**	**2020/2021 Full Year Forecast**	**2021/2022 Budget**	**2022/2023 Budget**	**2023/2024 Budget**
Total	**100.00%**	**R1 345 559 000**	**R1 495 006 000**	**R1 535 060 000**	**R1 600 612 000**

Source: Medium Term Revenue and Expenditure Framework for Overstrand 2021/2022: 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 Overstrand Municipality to better manage its risks, and more effectively plan and prioritise the wave of renewals that are going to be required over the next 20 years.

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

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

- Continue with the implementation of the Asset Maintenance Plan, 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 Overstrand Municipality to ensure that sufficient funding is allocated towards an asset replacement fund, in order to ensure adequate rehabilitation and maintenance of the existing infrastructure.

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

- Overstrand Municipality needs to ensure that the Credit Control and Debt Collection By-laws 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 Overstrand Municipality's Future Capital Budget				
Capital Expenditure Standard	**2020/2021 Full Year Forecast**	**2021/2022 Budget**	**2022/2023 Budget**	**2023/2024 Budget**
Executive and Council	R466 000	R5 000	R5 000	R5 000
Finance and Administration	R3 070 000	R3 770 000	R6 120 000	R3 570 000
Internal Audit	R0	R0	R0	R0
Community and Social Services	R18 083 000	R9 992 000	R760 000	R760 000
Sport and Recreation	R8 588 000	R7 752 000	R500 000	R5 000 000
Public Safety	R13 168 000	R7 897 000	R350 000	R350 000
Housing	R42 940 000	R54 359 000	R36 458 000	R3 267 000

Table C.7.3: Estimated Capital Expenditure per Functional Classification of Overstrand Municipality's Future Capital Budget				
Capital Expenditure Standard	**2020/2021 Full Year Forecast**	**2021/2022 Budget**	**2022/2023 Budget**	**2023/2024 Budget**
Health	R0	R0	R0	R0
Planning and Development	R10 372 000	R7 987 000	R415 000	R415 000
Road Transport	R23 050 000	R11 524 000	R16 675 000	R4 450 000
Environmental Protection	R0	R0	R0	R0
Energy Sources	R19 119 000	R68 211 000	R19 775 000	R24 450 000
Water Management	R50 036 000	R51 982 000	R25 900 000	R22 000 000
Wastewater Management	R69 170 000	R47 481 000	R35 328 000	R31 568 000
Waste Management	R22 024 000	R3 815 000	R0	R0
Total Capital Expenditure Functional	**R280 086 000**	**R274 775 000**	**R142 286 000**	**R95 835 000**

Source: Medium Term Revenue and Expenditure Framework for Overstrand 2021/2022: Table A5 - Capital Expenditure by Vote, Functional Classification and Funding Source

The Water and Sewer Master Plans (June 2021) for the various towns in Overstrand Municipality's Management Area recommends upgrades to the water and sewer networks to the value of R458.698 million and R1 003.424 million respectively in the foreseeable future in order to accommodate development and population growth according to the SDF. Most of the capital projects for water and sewerage are currently funded through the Municipality's own budget.

The CRC of the water and sewerage infrastructure that will need to be replaced over the next five years (RUL <5 yrs) is R646.467 million. The asset renewal needs for the **water infrastructure assets** over the next 10 years is R65.965 million per year. The reinvestment required is R583.516 million in the first 5 years and R76.130 million in the second 5-year period. The age of 53.9% of the water infrastructure assets is greater than 20 years. The CRC of the water infrastructure with a condition grading of "Very Poor" is R381.667 million. The asset renewal needs for the **sewerage infrastructure assets** over the next 10 years is R17.718 million per year. The reinvestment required is R62.950 million in the first 5 years and R114.233 million in the second 5-year period. The age of 60.5% of the sewerage infrastructure assets is greater than 20 years. The CRC of the sewerage infrastructure with a condition grading of "Very Poor" is R18.346 million.

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

The recommendations for Overstrand 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 every three to five years and to use the Master Plans to list the desired infrastructure development requirements and reflect these in the IDP.

- Assign a high priority to the implementation of the WC/WDM Strategy in order to postpone additional capital investment for as long as possible, both from the water availability perspective as well as from the treatment of increased effluent volumes. The costs of physical water loss, the capital requirements for new water resources infrastructure, and the constraints of poor water availability on water dependent economic growth means that WC/WDM is a critical management priority for stretching the financial resources of the Municipality. WC/WDM is almost always a more cost-effective solution than the implementation of new infrastructure, and no new infrastructure should be developed until unauthorized water has been reduced to manageable volumes.

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

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

- Balance land-use and development planning (SDFs) in accordance with the availability of water and the capacity of WTWs and WWTWs that are in place or that will be implemented.

- 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 actively implement their Customer Care, Credit Control and Debt Collection Policy in order to minimize the percentage of non-payment for municipal services.

- To identify all possible sources of external funding over the next three years to assist Overstrand Municipality to address the bulk infrastructure backlogs that exist in the various towns as indicated in the tables under Topic 3.

- Continue with the implementation of the Asset Maintenance Plan for all the water and sewerage infrastructure, which indicates 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 Overstrand Municipality to commit to a substantial and sustained programme of capital renewal works.

Income:

Operational: The future planned revenue sources for Overstrand Municipality, as included in the approved 2021/2022 Budget, is as follows.

Table C.7.4: Revenue Items by Source, as Included in the 2020/2021 Budget

Revenue Item	2020/2021 Full Year Forecast	2021/2022 Budget	2022/2023 Budget	2023/2024 Budget
Property Rates	R259 241 000	R275 637 000	R286 662 000	R298 129 000
Service Charges - Electricity	R386 294 000	R499 317 000	R559 033 000	R625 910 000
Service Charges - Water	R128 520 000	R132 168 000	R137 455 000	R142 953 000
Service Charges - Sanitation	R78 913 000	R87 631 000	R91 137 000	R94 782 000
Service Charges - Refuse	R69 482 000	R74 741 000	R77 731 000	R80 840 000
Rental of facilities and equipment	R3 627 000	R 3 440 000	R3 148 000	R3 273 000
Interest earned – external investments	R26 400 000	R27 456 000	R28 554 000	R29 697 000
Interest earned – outstanding debtors	R4 650 000	R4 681 000	R4 868 000	R5 062 000
Dividends Received	R29 564 000	R28 223 000	R29 348 000	R30 519 000
Licences and Permits	R2 385 000	R2 039 000	R2 097 000	R2 164 000
Agency Services	R6 438 000	R6 680 000	R6 930 000	R7 189 000
Transfers and subsidies	R150 774 000	R139 692 000	R144 997 000	R148 209 000
Other Revenue	R96 604 000	R126 909 000	R91 759 000	R43 063 000
Gains	R10 500 000	R8 225 000	R8 361 000	R8 504 000
Total	**R1 253 392 000**	**R1 416 839 000**	**R1 472 060 000**	**R1 520 294 000**

Source: Medium Term Revenue and Expenditure Framework for Overstrand 2021/2022: Table A4 – Budgeted Financial Performance (Revenue and Expenditure)

Capital: Capital funding will have to increase substantially if existing service levels are to be sustained, which has to be the goal. In this regard Overstrand Municipality's own funding, as well as the grant funding must significantly exceed inflation. Other possible sources of funding and innovative funding mechanisms have to be explored.

It is important for Overstrand 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 Overstrand Municipality's total capital budget are summarised in the table below.

Table C.7.5: Sources of Funding for the Future Capital Budgets of Overstrand Municipality

Capital Funding Source	2020/2021 Full Year Forecast	2021/2022 Budget	2022/2023 Budget	2023/2024 Budget
National Government	R35 100 000	R45 754 000	R40 828 000	R32 568 000
Provincial Government	R2 127 000	R600 000	-	-
District Municipality	-	-	-	-
Transfers and Subsidies	R47 296 000	R65 201 000	R36 458 000	R3 267 000
Public contributions and Donations	-	-	-	-
Borrowing	R75 228 000	R94 066 000	R50 000 000	R50 000 000
Internally generated funds	R120 335 000	R69 154 000	R15 000 000	R10 000 000
Total Capital Funding	**R280 086 000**	**R274 775 000**	**R142 286 000**	**R95 835 000**

Source: Medium Term Revenue and Expenditure Framework for Overstrand 2021/2022: Table A5 - Capital Expenditure by Vote, Standard Classification and Funding

Tariff and Charges: The state of the economy, due to the Corona Virus pandemic, has an adverse effect on the consumers and their ability to pay for services. 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.

Overstrand Municipality's current six (6) block step tariff system discourages the wasteful or inefficient use of water. It is expected that this tariff structure will continue to be applied in the future. The sustainable supply of potable water is however becoming an ever-increasing challenge. This scarce commodity has to be optimally managed. The continued increase in the price of electricity and chemicals for purification has contributed to the cost of delivering the service. The water usage block tariff has been structured for a basic affordable tariff for up to 18 kl per household per month. Punitive tariffs are in place for excessive water consumption.

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

Table C.7.6: Comments on the Municipality's Residential Block Step Tariff Structure

Block (kl/month)	2017/2018	2018/2019	2019/2020	2020/2021	Comments
0 - 6	R4-50	R5-02	R5-60	R5-85	Free Basic Water
7 - 15	R10-24	R10-85	R11-47	R11-99	Low volume use
16 - 18					Typical use volume, including garden irrigation
19 - 30	R16-61	R17-61	R18-61	R19-45	
31 - 45	R25-57	R27-11	R28-66	R29-95	Above average use, including garden irrigation
46 - 60	R33-22	R35-21	R37-22	R38-89	
61 - 100	R44-30	R46-96	R49-64	R51-87	Wasteful use and/or severe garden irrigation
> 100					Significant waste and/or unnecessary garden irrigation

Overstrand Municipality will continue with their stepped block tariff system for water supply services. Wasteful or inefficient use of water is discouraged through increased tariffs. Overstrand Municipality also started in 2010/2011 with the implementation of volumetric sewerage tariffs.

The following tariff structure characteristics should remain in Overstrand Municipality's water tariffs 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 or high water use.

- The volumetric steps should be kept the same for all the areas within Overstrand 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 is 60 kl/month, above which residential water use is 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 with regard to 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 sewerage tariffs of Overstrand Municipality are as follows:

- Overstrand Municipality will continue to re-evaluate the tariffs they charge for their water and sanitation services on an annual basis in order to put the Municipality in a better financial position and to ensure that all the O&M expenditure for water and sanitation services are 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. Overstrand Municipality should note that revenue could potentially decrease as a result of reuse practices.

- Overstrand 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 Overstrand 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 Overstrand 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.

- The current water tariff codes adequately differentiate between the different types of consumers and their water usage.

TOPIC 8: WATER SERVICES INSTITUTIONAL ARRANGEMENTS AND CUSTOMER CARE

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

The Municipality will also continue to report annually and in a public way on progress in implementing the plan (WSDP Performance- and Water Services Audit Report), as part of Overstrand 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 W_2RAPs for the WWTWs and drainage networks need to be updated regularly. The WTW and WWTW Process Audits also needs to be updated regularly.

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

It is important for Overstrand Municipality to allocate adequate funding for the rehabilitation and maintenance of the existing infrastructure and all forward planning for new infrastructure should be guided by the new Water and Sewer Master Plans. Water and sanitation services are currently effectively managed by Overstrand Municipality.

Overstrand Municipality will continue with their mentoring role for operational personnel ensuring an adequately trained and DWS classified workforce with dedicated training programmes for supervisors and operational personnel. A Work Place Skills Plan for 2021/2022 is in place, which lists the training to be provided during the current financial year.

The effective management and monitoring of Veolia Water Solutions & Technologies South Africa (Pty) Ltd, who was appointed for the Water and Wastewater Bulk Contract, is a very important factor that will determine the ability of Overstrand Municipality to sustainably deliver safe and reliable water and to treat the effluent at the WWTWs to an acceptable standard. Monitoring the Contractor's compliance with the KPIs related to treatment processes and quality monitoring and control is essential because the Contractor's 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.

Overstrand Municipality will continue to actively focus on training, which requires the identification of trainers (from senior operators / officers / professional ranks) for the development and facilitation of courses which relate to specific organizational knowledge and systems requirements. Overstrand Municipality's internal reports such as the Water Safety Plan, W_2RAP and this WSDP contain some information on which the courses can be based. This will assist Overstrand Municipality's Human Resources Department in general and the skills development facilitator in particular to develop and implement effective workplace skills plans relevant to Human Capacity Development requirements.

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

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

The Water Safety Plans of Overstrand Municipality includes Improvement / Upgrade Plans. The purpose of the Improvement / Upgrade Plans is to address the existing significant risks where the existing controls were not effective or absent.

SECTION D: WATER SERVICES OBJECTIVES AND STRATEGIES

The water services strategies presented below were derived from the 2021/2022 Top Layer SDBIP and the water services situational analysis as summarized in Section C: Water Services Existing Needs Perspective and presents the 5-year Water Services strategies as established in the WSA's WSDP.

Table: Table D.1: Water Services Objectives and Strategies							
Objective / Strategy	Key Performance Indicator	Baseline (FY2020/2021 status quo)	WSDP FY2021/22 TARGET	WSDP FY2022/23 TARGET	WSDP FY2023/24 TARGET	WSDP FY2024/25 TARGET	WSDP FY2025/26 TARGET
Topic 1: Settlement Demographics & Public Amenities							
Sustainable Integrated Human Settlements	*Implement SDF and Growth Management Strategy for each of the towns and ensure new developments are in line with these priority action plans.*	*Targets to be set by other Department.*	*Targets to be set by other Department.*	*Targets to be set by other Department.*	*Targets to be set by other Department.*	*Targets to be set by other Department.*	*Targets to be set by other Department.*
Topic 2: Service Levels							
Ensure all households on the farms are provided with at least basic water services, subject to DWS guidance and provision of resources.	*Support all applications received for basic water services on the farms (Subject to availability of financial resources and sustainability of type of service).*	-	-	-	*100% of applications received are supported (Subject to availability of funding and sustainability of type of service).*	*100% of applications received are supported (Subject to availability of funding and sustainability of type of service).*	*100% of applications received are supported (Subject to availability of funding and sustainability of type of service).*
Ensure all households on the farms are provided with at least basic sanitation services, subject to DWS guidance and provision of resources.	*Support all applications received for basic sanitation services on the farms (Subject to availability of financial resources and sustainability of type of service).*	-	-	-	*100% of applications received are supported (Subject to availability of funding and sustainability of type of service).*	*100% of applications received are supported (Subject to availability of funding and sustainability of type of service).*	*100% of applications received are supported (Subject to availability of funding and sustainability of type of service).*
Provision of water to informal households based on the standard of 1 water point to 25 households.	Number of taps installed in relation to the number of informal households.	300	320	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.	Provide at least 1 water point to every 25 households in informal areas.
Provision of cleaned piped water to all formal households within 200m from the household.	Number of formal households that meet agreed service standards for piped water.	29 946	30 111	Target to be set in future year.	Target to be set in future year.	Target to be set in future year.	Target to be set in future year.
The provision of sanitation services to informal households based on the standard of 1 toilet to 5 households.	Number of toilet structures provided in relation to the number of informal households.	930	980	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.	Provide at least 1 toilet to every 5 households in informal areas.
Provision of sanitation services to formal residential households.	Number of formal households which are billed for sewerage in accordance to the SAMRAS financial system.	30 060	30 420	Target to be set in future year.	Target to be set in future year.	Target to be set in future year.	Target to be set in future year.
Provision of sanitation services to informal households on invaded land with available funding.	The number of toilets provided for informal households on invaded land with available funding.	105	95	Target to be set in future year.	Target to be set in future year.	Target to be set in future year.	Target to be set in future year.
Provision of water to informal households on invaded land with available funding.	The number of taps installed for informal households on invaded land with available funding.	80	70	Target to be set in future year.	Target to be set in future year.	Target to be set in future year.	Target to be set in future year.
Topic 3: Water Services Asset Management							

Table: Table D.1: Water Services Objectives and Strategies							
Objective / Strategy	Key Performance Indicator	Baseline (FY2020/2021 status quo)	WSDP FY2021/22 TARGET	WSDP FY2022/23 TARGET	WSDP FY2023/24 TARGET	WSDP FY2024/25 TARGET	WSDP FY2025/26 TARGET
The provision and maintenance of municipal services.	*Ensure adequate storage capacity for all towns (At least 48hrs AADD).*	-	-	*All eight areas with an overall storage capacity above 48hrs AADD.*	*All eight areas with an overall storage capacity above 48hrs AADD.*	*All eight areas with an overall storage capacity above 48hrs AADD.*	*All eight areas with an overall storage capacity above 48hrs AADD.*
Implement projects included in the Water Master Plan	*Ensure adequate water pump station and water reticulation capacity.*	-	-	*Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.*	*Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.*	*Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.*	*Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.*
Implement projects included in the Sewer Master Plan	*Ensure adequate sewer pump station and drainage network capacity.*	-	-	*Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.*	*Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.*	*Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.*	*Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.*
The provision and maintenance of municipal services	*Ensure all water and sewerage infrastructure assets are included in the Asset Register, with accurate CRC, DRC, RUL and Age.*	-	-	*Annual reporting to the Financial Department on water and sewerage assets not yet included in the Asset Register and assets for which the CRC, DRC, RUL and Age in the Asset Register is not correct.*	*Annual reporting to the Financial Department on water and sewerage assets not yet included in the Asset Register and assets for which the CRC, DRC, RUL and Age in the Asset Register is not correct.*	*Annual reporting to the Financial Department on water and sewerage assets not yet included in the Asset Register and assets for which the CRC, DRC, RUL and Age in the Asset Register is not correct.*	*Annual reporting to the Financial Department on water and sewerage assets not yet included in the Asset Register and assets for which the CRC, DRC, RUL and Age in the Asset Register is not correct.*
Topic 4: Water Services Operation and Maintenance							
The provision and maintenance of municipal services.	*% Of recommendations, as included in the WTW Process Audits, implemented.*	-	-	*60% of recommendations implemented.*	*70% of recommendations implemented.*	*80% of recommendations implemented.*	*90% of recommendations implemented.*
The provision and maintenance of municipal services.	*% Of recommendations, as included in the WWTW Process Audits, implemented.*	-	-	*60% of recommendations implemented.*	*70% of recommendations implemented.*	*80% of recommendations implemented.*	*90% of recommendations implemented.*
The provision and maintenance of municipal services.	*% Of recommendations, as included in the Improvement / Upgrade Plan of the Water Safety Plan, implemented.*	-	-	*60% of recommendations implemented.*	*70% of recommendations implemented.*	*80% of recommendations implemented.*	*90% of recommendations implemented.*

Table: Table D.1: Water Services Objectives and Strategies							
Objective / Strategy	Key Performance Indicator	Baseline (FY2020/2021 status quo)	WSDP FY2021/22 TARGET	WSDP FY2022/23 TARGET	WSDP FY2023/24 TARGET	WSDP FY2024/25 TARGET	WSDP FY2025/26 TARGET
The provision and maintenance of municipal services.	*% Of recommendations, as included in the Improvement / Upgrade Plan of the W_2RAP, implemented.*	-	-	*60% of recommendations implemented.*	*70% of recommendations implemented.*	*80% of recommendations implemented.*	*90% of recommendations implemented.*
The provision and maintenance of municipal services	*Ensure a budget of at least 1% of the total value of the water and sewerage assets is allocated towards the annual O&M of the systems.*	-	-	*A budget of 1% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.*	*A budget of 1% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.*	*A budget of 1% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.*	*A budget of 1% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.*
The provision and maintenance of municipal services.	*Ensure a budget of at least 2% of the total value of the water and sewerage assets is allocated towards the replacement of existing infrastructure per annum.*	-	-	*A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.*	*A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.*	*A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.*	*A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.*
Reporting on water quality and wastewater quality compliance percentages.	*Report at least annually on the percentage of water quality and wastewater quality compliance.*	-	-	*At least annual publication of water quality and wastewater quality compliance percentages.*	*At least annual publication of water quality and wastewater quality compliance percentages.*	*At least annual publication of water quality and wastewater quality compliance percentages.*	*At least annual publication of water quality and wastewater quality compliance percentages.*
Completion of works orders within the next calendar month for sewerage maintenance (network): Gansbaai, Hermanus, Stanford and Hangklip/Kleinmond.	% Compliance within the completion time.	92%	92%	92%	92%	92%	92%
Completion of works orders within the next calendar month for sewer tanker services maintenance: Gansbaai, Hermanus, Stanford and Hangklip/Kleinmond.	% Compliance within the completion time.	98%	98%	98%	98%	98%	98%
Completion of works orders within the next calendar month for water distribution services: Gansbaai, Hangklip/Kleinmond, Hermanus and Stanford.	% Compliance with the completion time.	92%	92%	92%	92%	92%	92%
Monthly monitoring of water and waste water quality results of all treatment plants and reporting to DWS via website.	Number of months monitored.	12	12	12	12	12	12
Quality of effluent comply 75% with general or special limit in terms of the Water Act (Act 36 of 1998).	% Compliance	90%	75%	75%	80%	85%	90%

Table: Table D.1: Water Services Objectives and Strategies							
Objective / Strategy	Key Performance Indicator	Baseline (FY2020/2021 status quo)	WSDP FY2021/22 TARGET	WSDP FY2022/23 TARGET	WSDP FY2023/24 TARGET	WSDP FY2024/25 TARGET	WSDP FY2025/26 TARGET
Quality of potable water comply 95% with SANS241.	% Compliance with SANS241.	95%	95%	95%	95%	95%	95%
Topic 5: Conservation and Demand Management (Topic 5.1: Water Resources)							
Limit unaccounted water to less than 20%.	% of water unaccounted for	19%	18%	18%	18%	18%	18%
Topic 5: Conservation and Demand Management (Topic 5.2: Water Balance)							
The provision and maintenance of municipal services.	*Ensure all bulk water is metered at source, at WTW (incoming and outgoing) and at bulk storage reservoirs and the meters are read and recorded on at least a monthly basis.*	-	-	*95% of all sources metered and bulk water meters read and recorded at least monthly.*	*96% of all sources metered and bulk water meters read and recorded at least monthly.*	*97% of all sources metered and bulk water meters read and recorded at least monthly.*	*98% of all sources metered and bulk water meters read and recorded at least monthly.*
The provision and maintenance of municipal services.	*Ensure all incoming and outgoing flows 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.*	-	-	*95% of all flows at WWTWs metered and meters read and recorded at least monthly.*	*96% of all flows at WWTWs metered and meters read and recorded at least monthly.*	*97% of all flows at WWTWs metered and meters read and recorded at least monthly.*	*98% of all flows at WWTWs metered and meters read and recorded at least monthly.*
Topic 6: Water Resources							
The provision and maintenance of municipal services.	*% Of abstraction from sources registered and authorized by the DWS.*	-	-	*70% Compliance*	*80% Compliance*	*90% Compliance*	*95% Compliance*
The provision and maintenance of municipal services.	*Ensure yields and allocations are adequate to meet at least the projected five year water requirements for all eight areas.*	-	-	*100% adequate supply to meet water requirements for all eight areas.*	*100% adequate supply to meet water requirements for all eight areas.*	*100% adequate supply to meet water requirements for all eight areas.*	*100% adequate supply to meet water requirements for all eight areas.*
The provision and maintenance of municipal services.	*% Monitoring of effluent discharged by industrial consumers (Quantity and Quality)*	-	-	*50% of all industrial consumers monitored wrt quality and quantity of effluent discharged by them.*	*60% of all industrial consumers monitored wrt quality and quantity of effluent discharged by them.*	*70% of all industrial consumers monitored wrt quality and quantity of effluent discharged by them.*	*80% of all industrial consumers monitored wrt quality and quantity of effluent discharged by them.*
Topic 7: Financial							
95% Of the approved capital budget spent.	% Of the capital budget spent	95%	95%	95%	95%	95%	95%
Topic 8: Institutional Arrangements and Customer Care							
Maintenance of sanitation services (tankers and networks) measured by the daily recording/completion of enquiries within the next calendar month (Deputy Director)	% completed	92%	92%	92%	92%	92%	92%

Table: Table D.1: Water Services Objectives and Strategies							
Objective / Strategy	Key Performance Indicator	Baseline (FY2020/2021 status quo)	WSDP FY2021/22 TARGET	WSDP FY2022/23 TARGET	WSDP FY2023/24 TARGET	WSDP FY2024/25 TARGET	WSDP FY2025/26 TARGET
Maintenance of water services measured by the daily recording/completion of enquiries/completed within the next calendar month	% completed	92%	92%	92%	92%	92%	92%
Report on the implementation of the WSDP annually by the end of October.	Report submitted.	1	1	1	1	1	1

SECTION E: WATER SERVICES MTEF PROJECTS

The Draft 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 FY2022/23, Table E.2b provides the projects identified for implementation in FY2023/24 and Table E2c provides the projects identified for implementation in FY2024/25. The 2022/2023 Capital Budget is not yet finalised and the funded projects therefore might still change.

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 Overstrand Municipality.

The summary of the MTEF water services projects are presented as follows.

Table E.1: Summary of MTEF Projects

Project Main Category	FY2022/23		FY2023/24		FY2024/25		MTEF Total	
	Nr	Value (R'000)	Nr	Value (R'000)	Nr	Value (R'000)	Nr	Value (R'000)
Water Projects	11	R34 615	8	R19 000	7	R37 500	**14**	**R91 115**
Sanitation Projects	5	R18 900	5	R22 530	6	R26 700	**8**	**R68 130**
Combined Water & Sanitation Projects	**16**	**R53 515**	**13**	**R41 530**	**13**	**R64 200**	**22**	**R159 245**

Table E.2a: Water Services MTEF Projects - FY2022/23 (1st 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 FY2020/21	FY2022/23 Budget	Own	MIG	RBIG	WSIG	DR	MWIG	Other	Total Cost	
1. Infrastructure Projects								**R0**	**R32,715**								**R32,715**	
1.1		Fencing at water installations	Install fencing at water infrastructure	Security	Water	Other	Security		**R700**	R700							**R700**	Water Safety Plans
1.2		Water Facilities (Contingency)	Ensure adequate equipment at water facilities.	Water Quality	Water	Bulk	WTW		**R500**	R500							**R500**	WTW Process Audits
1.3		Upgrade water lines and new Booster PS valves	Upgrade water pipelines and Booster PS	Services	Water	Internal	Reticulation		**R7,000**		R7,000						**R7,000**	Water Master Plans
1.4		Upgrade bulk water Stanford	Upgrade bulk water	Services	Water	Bulk	Bulk pipelines		**R5,615**		R5,615						**R5,615**	Water Master Plans
1.5		Sewerage Facilities (Contingency)	Ensure adequate equipment at sewerage facilities.	Effluent Quality	Sewerage	Bulk	WWTW		**R500**	R500							**R500**	WWTW Process Audits
1.6		Kleinmond WWTW refurbishment and upgrade (F1/3)	Upgrade and refurbish WWTW	Effluent Quality	Sewerage	Bulk	WWTW		**R9,300**	R9,300							**R9,300**	WSDP and WWTW Process Audit
1.7		Fencing at sewerage installations	Install fencing at sewerage infrastructure	Security	Sewerage	Other	Security		**R500**	R500							**R500**	WSDP, W_2RAP, WWTW Process Audit
1.8		Upgrading of pump stations and rising mains (F1/3)	Upgrade pump stations and rising mains	Waterborne sanitation	Sewerage	Bulk	Pump stations and rising mains		**R7,500**	R7,500							**R7,500**	WSDP and Sewer Master Plans
1.9		Hermanus WWTW upgrade Screens RAS Sludge Dewatering	Upgrade screens, RAS and Sludge dewatering	Effluent Quality	Sewerage	Bulk	WWTW		**R1,100**	R1,100							**R1,100**	WWTW Process Audit
2. Source Development Projects								**R0**	**R3,000**								**R3,000**	
2.1		Upgrade Hermanus Wellfields Phase 2	Further groundwater development for Hermanus	Security of Supply	Water	Bulk	Sources		**R3,000**	R3,000							**R3,000**	WSDP
3. Demand Management projects								**R0**	**R13,600**								**R13,600**	
3.1		Replacement of water pipelines	Replace old sections of water reticulation network	Refurbishment	Water	Internal	Water reticulation		**R13,600**	R13,600							**R13,600**	Refurbishment
4. O&M Commitments								**R0**	**R4,200**								**R4,200**	
Operations																		
									R0								**R0**	
Maintenance																		
4.1		Refurbishment of bulk water pipelines	Replace old bulk water pipelines	Refurbishment	Water	Bulk	Bulk pipelines		**R1,000**	R1,000							**R1,000**	Refurbishment and WSDP
4.2		Access Roads to Kleinmond and Buffelsrivier WTW upgrade	Upgrade access roads to WTW	Refurbishment	Water	Bulk	WTW		**R1,000**	R1,000							**R1,000**	Refurbishment
4.3		Refurbish Kraaibosch Pump Station and Pipeline	Refurbishment of pump station and pipeline	Refurbishment	Water	Bulk	Pump station and bulk pipeline		**R1,000**	R1,000							**R1,000**	Refurbishment
4.4		De Kelders WTW Membrane Replacement	Replacement of Membranes	Refurbishment	Water	Bulk	WTW		**R800**	R800							**R800**	Refurbishment
4.5		Franskraal WTW Filters Refurbish	Refurbishment of WTW	Refurbishment	Water	Bulk	WTW		**R400**	R400							**R400**	Refurbishment
5. Institutional								**R0**	**R0**								**R0**	
6. Water Services Programmes								**R0**	**R110**								**R110**	
Awareness Programs																		
6.1		School WC/WDM initiatives (OPEX)	Puppet shows and live shows (WC/WDM)						**R110**	R110							**R110**	WDM Strategy
WASH Programs																		
									R0								**R0**	
		Total						**R0**	**R53,625**								**R53,625**	

Note: Projects Water Facilities (Contingency) and Sewerage Facilities (Contingency) in the above table include the installation of standby generators in phases at critical water and sanitation facilities to ensure continuous operation during electricity supply interruptions.

Table E.2b: Water Services MTEF Projects - FY2023/24 (2nd 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 FY2021/22	FY2023/24 Budget	Own	MIG	RBIG	WSIG	DR	MWIG	Other	Total Cost	
1. Infrastructure Projects								**R0**	**R23,580**								**R23,580**	
1.1		Fencing at water installations	Install fencing at water infrastructure	Security	Water	Other	Security		**R550**	R550							**R550**	Water Safety Plans
1.2		Water Facilities (Contingency)	Ensure adequate equipment at water facilities.	Water Quality	Water	Bulk	WTW		**R500**	R500							**R500**	WTW Process Audits
1.3		Sewerage Facilities (Contingency)	Ensure adequate equipment at sewerage facilities.	Effluent Quality	Sewerage	Bulk	WWTW		**R700**	R700							**R700**	WWTW Process Audits
1.4		Kleinmond WWTW refurbishment and upgrade (F1/3 and F3/3).	Upgrade and refurbish WWTW	Effluent Quality	Sewerage	Bulk	WWTW		**R15,430**	R8,900	R6,530						**R15,430**	WSDP and WWTW Process Audit
1.5		Fencing at sewerage installations	Install fencing at sewerage infrastructure	Security	Sewerage	Other	Security		**R800**	R800							**R800**	WSDP, W_2RAP, WWTW Process Audit
1.6		Upgrading of pump stations and rising mains (F1/3)	Upgrade pump stations and rising mains	Waterborne sanitation	Sewerage	Bulk	Pump stations and rising mains		**R4,400**	R4,400							**R4,400**	WSDP and Sewer Master Plans
1.7		Hermanus WWTW upgrade Screens RAS Sludge Dewatering	Upgrade screens, RAS and Sludge dewatering	Effluent Quality	Sewerage	Bulk	WWTW		**R1,200**	R1,200							**R1,200**	WWTW Process Audit
2. Source Development Projects								**R0**	**R2,000**								**R2,000**	
2.1		Upgrade Hermanus Wellfields Phase 2	Further groundwater development for Hermanus	Security of Supply	Water	Bulk	Sources		**R2,000**	R2,000							**R2,000**	WSDP
									R0								**R0**	
3. Demand Management projects								**R0**	**R3,000**								**R3,000**	
3.1		Replacement of water pipelines	Replace old sections of water reticulation network	Refurbishment	Water	Internal	Water reticulation		**R3,000**	R3,000							**R3,000**	Refurbishment
4. O&M Commitments								**R0**	**R12,950**								**R12,950**	
Operations																		
									R0								**R0**	
Maintenance																		
4.1		Refurbishment of bulk water pipelines	Replace old bulk water pipelines	Refurbishment	Water	Bulk	Bulk pipelines		**R800**	R800							**R800**	Refurbishment and WSDP
4.2		Refurbishment of the Kleinmond and Buffels River WTW	Refurbishment of WTWs	Refurbishment	Water	Bulk	WTW		**R11,000**	R11,000							**R11,000**	Refurbishment and WSDP
4.3		Pearly Beach Water Tower Refurbishment	Refurbishment of Water Tower	Refurbishment	Water	Internal	Reservoir		**R750**	R750							**R750**	Refurbishment
4.4		Preekstoel Bio Plant Filters Refurbishment	Refurbishment of filters	Refurbishment	Water	Bulk	WTW		**R400**	R400							**R400**	Refurbishment
5. Institutional								**R0**	**R0**								**R0**	
6. Water Services Programmes								**R0**	**R110**								**R110**	
Awareness Programs																		
6.1		School WC/WDM initiatives (OPEX)	Puppet shows and live shows (WC/WDM)						**R110**	R110							**R110**	WDM Strategy
WASH Programs																		
									R0								**R0**	
		Total						**R0**	**R41,640**								**R41,640**	

Note: Projects Water Facilities (Contingency) and Sewerage Facilities (Contingency) in the above table include the installation of standby generators in phases at critical water and sanitation facilities to ensure continuous operation during electricity supply interruptions.

Table E.2c: Water Services MTEF Projects - FY2024/25 (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 FY2022/23	FY2024/25 Budget	Own	MIG	RBIG	WSIG	DR	MWIG	Other	Total Cost	
1. Infrastructure Projects								**R0**	**R26,100**								**R26,100**	
1.1		Fencing at water installations	Install fencing at water infrastructure	Security	Water	Other	Security		**R700**	R700							**R700**	Water Safety Plans
1.2		Water Facilities (Contingency)	Ensure adequate equipment at water facilities.	Water Quality	Water	Bulk	WTW		**R500**	R500							**R500**	WTW Process Audits
1.3		Sewerage Facilities (Contingency)	Ensure adequate equipment at sewerage facilities.	Effluent Quality	Sewerage	Bulk	WWTW		**R700**	R700							**R700**	WWTW Process Audits
1.4		Gansbaai CBD sewer network extension (F1/2)	Sewerage network extension in Gansbaai	Waterborne sanitation	Sewerage	Internal	Drainage network		**R7,000**	R7,000							**R7,000**	WSDP and Sewer Master Plans
1.5		Fencing at sewerage installations	Install fencing at sewerage infrastructure	Security	Sewerage	Other	Security		**R800**	R800							**R800**	WSDP, W_2RAP, WWTW Process Audit
1.6		Upgrading of pump stations and rising mains (F1/3)	Upgrade pump stations and rising mains	Waterborne sanitation	Sewerage	Bulk	Pump stations and rising mains		**R10,400**	R10,400							**R10,400**	WSDP and Sewer Master Plans
1.7		Hawston WWTW refurbishment and upgrade.	Upgrade and refurbish WWTW	Effluent Quality	Sewerage	Bulk	WWTW		**R6,000**							R6,000	**R6,000**	WSDP and WWTW Process Audit
2. Source Development Projects								**R0**	**R3,100**								**R3,100**	
2.1		Upgrade Hermanus Wellfields Phase 2	Further groundwater development for Hermanus	Security of Supply	Water	Bulk	Sources		**R3,100**	R3,100							**R3,100**	WSDP
3. Demand Management projects								**R0**	**R14,200**								**R14,200**	
3.1		Replacement of water pipelines	Replace old sections of water reticulation network	Refurbishment	Water	Internal	Water reticulation		**R12,400**	R12,400							**R12,400**	Refurbishment
3.2		Reroute Hermanus WWTW Treated Effluent irrigation Pipeline	Reroute irrigation pipeline	Re-use	Sewerage	Bulk	Bulk pipelines		**R1,800**	R1,800							**R1,800**	WWTW Process Audit
4. O&M Commitments								**R0**	**R20,800**								**R20,800**	
Operations																		
Maintenance																		
4.1		Refurbishment of bulk water pipelines	Replace old bulk water pipelines	Refurbishment	Water	Bulk	Bulk pipelines		**R1,000**	R1,000							**R1,000**	Refurbishment and WSDP
4.2		Refurbishment of the Kleinmond and Buffels River WTW	Refurbishment of WTWs	Refurbishment	Water	Bulk	WTW		**R19,000**	R19,000							**R19,000**	Refurbishment and WSDP
4.3		De Kelders WTW Membrane Replacement	Replacement of Membranes	Refurbishment	Water	Bulk	WTW		**R800**	R800							**R800**	Refurbishment
5. Institutional								**R0**	**R0**								**R0**	
6. Water Services Programmes								**R0**	**R110**								**R110**	
Awareness Programs																		
6.1		School WC/WDM initiatives (OPEX)	Puppet shows and live shows (WC/WDM)						**R110**	R110							**R110**	WDM Strategy
WASH Programs																		
		Total						**R0**	**R64,310**								**R64,310**	

Note: Projects Water Facilities (Contingency) and Sewerage Facilities (Contingency) in the above table include the installation of standby generators in phases at critical water and sanitation facilities to ensure continuous operation during electricity supply interruptions.

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 2021 Master Plans were incorporated into the WSDP.

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

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

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

Overstrand Municipality's IDP, Final Review of 5 Year IDP (2021/2022), list the following major water services projects which are planned for the short to medium term.

- Expansion of the well fields in Hermanus.
- New reservoirs at Sandbaai, Pringle Bay and Gansbaai.
- Phased replacement and upgrade of the bulk and reticulation water systems in all areas.
- Refurbishment of De Bos and Buffels River Dam inlet structures and equipment.
- Refurbishment of the Kleinmond and Buffels River Water Treatment Plants.
- Water Treatment Plant (Stabilization) at Stanford.
- Water Treatment Plant for Buffeljags Bay.
- Direct wastewater re-use scheme for Hermanus, and Seawater Desalination scheme.
- Possible transfer scheme from Theewaterskloof Dam for Hermanus and Kleinmond.

The following major sanitation services projects are planned for the short to medium term.

- Upgrade of the Stanford Wastewater Treatment Works (WWTW).
- Upgrade of sewerage pump stations.
- Upgrade of the Zwelihle sewer network.
- Upgrade of the Kidbrooke sewer.
- Extension of sewer networks in Kleinmond, Stanford and Gansbaai.
- Replacement of sewer rising main pipelines in Kleinmond and Greater Hermanus.
- Refurbishment of components/processes at the Hawston and Kleinmond WWTWs.

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

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

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

The current needs projects are estimated at R280.479 million of which 57% are funded over the next three years, as included in the MTEF project list. It should however be emphasised that additional funding will be required to address the full achievement of the water services strategies as outlined in Section D, but that the extent of such additional funding can only be determined once initial investigations and activities have been concluded.

WSDP-IDP WATER SECTOR INPUT REPORT FOR 2022/2023

Table F.1: WSDP FY2022/23: 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 of the households on the farms without basic water services.	Ensure all households on farms are provided with at least basic water services, DWS guidance. (As soon as funding is provided by DWS)	WSDP	No	OS2223001	Provide basic water services on the farms in the rural areas without basic water services.	R664	Yes	No	No
2.2	Some of the households on the farms without basic sanitation services.	Ensure all households on farms are provided with at least basic sanitation services, DWS guidance. (As soon as funding is provided by DWS)	WSDP	No	OS2223002	Provide basic sanitation services on the farms in the rural areas without basic sanitation services.	R2 160	Yes	No	No
Topic 3: Water Services Asset Management (Infrastructure)										
3.1	Security at water installations not adequate	Ensure all water installations are adequately secured	MTEF Project	Yes	OS2223003	Fencing at water installations	R2 600	No	Yes	Yes
3.2	Some equipment at water facilities needs to be replaced	Ensure compliance with water quality standards SANS241	MTEF Project	Yes	OS2223004	Water Facilities (Contingency)	R2 500	No	Yes	Yes
3.3	Inadequate pressure and supply to consumers	Ensure adequate pressure and supply	MTEF Project	Yes	OS2223005	New Voorberg Booster Pump Station	R3 000	Yes	Yes	No
3.4	Capacity of existing water reticulation network is inadequate	Upgrade water reticulation network capacity	MTEF Project	Yes	OS2223006	Upgrade water lines and new Booster PS valves (Masakhane)	R7 000	Yes	Yes	Yes
3.5	Bulk pipeline capacity is inadequate	Upgrade bulk water pipelines capacity	MTEF Project	Yes	OS2223007	Upgrade bulk water for Stanford	R5 615	Yes	Yes	Yes
3.6	Inadequate supply to consumers	Ensure adequate supply for De Kelders	MTEF Project	Yes	OS2223008	New Booster pump station Gansbaai to De Kelders & Pipeline Refurbishment	R7 000	Yes	Yes	No
3.7	Lack of adequate storage capacity for treated water	Ensure adequate storage capacity	MTEF Project	Yes	OS2223009	New Reservoir Onrus River	R8 190	Yes	Yes	No
3.8	Lack of adequate storage capacity for treated water	Ensure adequate storage capacity	MTEF Project	Yes	OS2223010	New Reservoir Bettiesbaai Voorberg	R10 970	Yes	Yes	No
3.9	Some equipment at sewerage facilities needs to be replaced	Ensure compliance with final effluent quality standards	MTEF Project	Yes	OS2223011	Sewerage Facilities (Contingency)	R3 300	No	Yes	Yes
3.10	Not all areas connected to waterborne sewer network	Sewer network extension and replacement	MTEF Project	Yes	OS2223012	Kleinmond sewer network extension	R5 400	No	Yes	No
3.11	Capacity of existing WWTW is inadequate	Ensure adequate treatment capacity	MTEF Project	Yes	OS2223013	Kleinmond WWTW refurbishment and upgrade.	R24 730	Yes	Yes	Yes
3.12	Not all areas connected to waterborne sewer network	Sewer network extension	MTEF Project	Yes	OS2223014	Gansbaai CBD sewer network extension	R7 000	No	Yes	Yes
3.13	Security at sewerage installations not adequate	Ensure all sewerage installations are adequately secured	MTEF Project	Yes	OS2223015	Fencing at sewerage installations	R3 500	No	Yes	Yes
3.14	Inadequate pump and bulk rising mains capacity	Upgrade capcity of sewer pump stations and rising mains	MTEF Project	Yes	OS2223016	Upgrading of pump stations and rising mains	R37 300	No	Yes	Yes
3.15	Capacity of existing WWTW is inadequate	Ensure adequate treatment capacity	MTEF Project	Yes	OS2223017	Hawston WWTW refurbishment and upgrade.	R16 200	Yes	Yes	Yes
3.16	Capacity of existing WWTW is inadequate	Ensure adequate treatment capacity	MTEF Project	Yes	OS2223018	Hermanus WWTW upgrade Screens, RAS and Sludge Dewatering	R2 300	Yes	Yes	Yes
3.17	Not all areas connected to waterborne sewer network	Sewer network extension and replacement	MTEF Project	Yes	OS2223019	Gansbaai WWTW 2nd reactor commission	R2 000	Yes	Yes	Yes
Topic 4: Water Services Operation and Maintenance										
4.1	Some of the bulk water pipelines are in a poor or very poor condition and needs to be replaced.	Refurbish all bulk water pipelines that are in a poor or very poor condition, with regular pipeline failures.	MTEF Project	Yes	OS2223020	Refurbishment of bulk water pipelines	R4 800	No	Yes	Yes
4.2	Access roads to Kleinmond and Buffelsriver WTW are inadequate.	Improve access roads to WTW	MTEF Project	Yes	OS2223021	Access Roads to Kleinmond Buffelsrivier WTW upgrade	R1 000	Yes	Yes	Yes
4.3	Existing treated treated effluent pipeline needs to be reroute	Reroute existing treated effluent pipeline (Irrigation)	MTEF Project	Yes	OS2223022	Reroute Hermanus WWTW Treated Effluent irrigation Pipeline	R1 800	Yes	Yes	Yes
4.4	Some of the components of the Kleinmond and Buffels River WTWs need to be refurbish (WTW Process Audits)	Refurbish existing WTWs	MTEF Project	Yes	OS2223023	Refurbishment of the Kleinmond and Buffels River WTW	R36 000	Yes	Yes	Yes
4.5	The Kraaibosch pump station and pipeline need to be refurbished	Refurbish existing pump station and pipeline.	MTEF Project	Yes	OS2223024	Refurbish Kraaibosch Pump Station and Pipeline	R1 000	Yes	Yes	Yes
4.6	RO Membranes need to be replaced	Ensure regular replacement of RO membranes	MTEF Project	Yes	OS2223025	De Kelders WTW Membrane Replacement	R1 600	Yes	Yes	Yes
4.7	Pearly Beach Water Tower needs to be refurbished	Refurbish existing Water Tower	MTEF Project	Yes	OS2223026	Pearly Beach Water Tower Refurbishment	R750	Yes	Yes	Yes
4.8	Filters at Franskraal WTW needs to be refurbished	Refurbish existing sand filters	MTEF Project	Yes	OS2223027	Franskraal WTW Filters Refurbish	R400	Yes	Yes	Yes
4.9	Preekstoel Bio Plant Filters to be refurbishment	Refurbish existing sand filters	MTEF Project	Yes	OS2223028	Preekstoel Bio Plant Filters Refurbishment	R400	Yes	Yes	Yes
4.10	WTW Process Audits need to be done annually	Sustainable operation of WTW	WSDP	Yes	OS2223029	Annual WTW Process Audits	R150	Yes	Yes	O&M
4.11	WWTW Process Audits need to be done annually	Sustainable operation of WWTW	WSDP	Yes	OS2223030	Annual WWTW Process Audits	R150	Yes	Yes	O&M
Topic 5: Conservation and Demand Management (Topic 5.1 Water Resources)										
	Done internally through O&M Budget									
Topic 5: Conservation and Demand Management (Topic 5.2 Water Balance)										
5.1	Sections of the existing water reticulation networks are in a poor or very poor condition and need to be replaced.	Refurbish all water reticulation pipelines that are in a poor or very poor condition, with regular pipeline failures.	MTEF Project	Yes	OS2223031	Replacement of Overstrand water pipelines	R60 300	No	Yes	Yes
5.2	Meter Replacement Programme	Replace old / broken / leaking meters	WSDP	Yes	OS2223032	Replacement of Overstrand water meters (Part of O&M Budget)	R0	No	Yes	O&M
5.3	WC/WDM programmes are required at schools to raise awareness	Schools Awareness Programme	WSDP	Yes	OS2223033	WC/WDM Awareness Raising Programmes for Schools (Part of O&M Budget)	R0	No	Yes	O&M
Topic 6: Water Resources										
6.1	Capacity of existing water resources is inadequate to meet projected future water requirements	Ensure yields of existing sources are adequate to meet future water requirements	MTEF Project	Yes	OS2223034	Upgrade Hermanus Wellfields Phase 2	R6 100	Yes	Yes	Yes
6.2	Capacity of existing water resources is inadequate to meet projected future water requirements	Ensure yields of existing sources are adequate to meet future water requirements	MTEF Project	Yes	OS2223035	Sea Water Desalination Plant	R15 000	No	Yes	No
Topic 7: Financial										
	Done by other Department									
Topic 8: Institutional Arrangements and Customer Care										
TOTAL: CURRENT NEEDS							**R280 879**			
	Funded						R159 245			
	% funded						57%			

Table F.1: WSDP FY2022/23: LIST OF CONCEPTUAL PROJECTS

Nr	Situation Assessment (Problem Definition)	Solution description as defined by topic situation assessment (Strategy)	Conceptual project	Is there an existing project addressing this problem?	Existing Projects Information			Does this current listed project address the problem totally?	Approved by Council, in project database and part of 5 year IDP cycle projects?	Project listed in 3yr MTEF - cycle?
					Project Number (Dept)	Project Title	Project Cost R'000			
FUTURE NEEDS										
Infrastructure										
F.1	Inadequate capacity of existing internal water reticulation networks	Ensure adequate internal water reticulation capacity	Water Master Plan	No	OS2223036	Future internal reticulation network items for Buffels River	R14 320	Yes	No	No
F.2			Water Master Plan	No	OS2223037	Future internal reticulation network items for Kleinmond	R5 573	Yes	No	No
F.3			Water Master Plan	No	OS2223038	Future internal reticulation network items for Greater Hermanus	R48 403	Yes	No	No
F.4			Water Master Plan	No	OS2223039	Future internal reticulation network items for Stanford	R5 716	Yes	No	No
F.5			Water Master Plan	No	OS2223040	Future internal reticulation network items for Greater Gansbaai	R65 683	Yes	No	No
F.6			Water Master Plan	No	OS2223041	Future internal reticulation network items for Pearly Beach	R2 305	Yes	No	No
F.7			Water Master Plan	No	OS2223042	Future internal reticulation network items for Baardskeerdersbos	R102	Yes	No	No
F.8	Inadequate bulk water pipeline distribution capacity	Ensure adequate bulk water pipeline distribution capacity	Water Master Plan	No	OS2223043	Future bulk water pipeline items for Buffels River	R10 012	Yes	No	No
F.9			Water Master Plan	No	OS2223044	Future bulk water pipeline items for Greater Hermanus	R44 968	Yes	No	No
F.10			Water Master Plan	No	OS2223045	Future bulk water pipeline items for Greater Gansbaai	R12 739	Yes	No	No
F.11			Water Master Plan	No	OS2223046	Future bulk water pipeline items for Baardskeerdersbos	R987	Yes	No	No
F.12	Inadequate reservoir storage capacity to meet future requirements	Ensure adequate reservoir storage capacity	Water Master Plan	No	OS2223047	Future reservoirs for Buffels River	R23 070	Yes	No	No
F.13			Water Master Plan	No	OS2223048	Future reservoirs for Greater Hermanus	R93 343	Yes	No	No
F.14			Water Master Plan	No	OS2223049	Future reservoirs for for Stanford	R10 962	Yes	No	No
F.15			Water Master Plan	No	OS2223050	Future reservoirs for Greater Gansbaai	R78 073	Yes	No	No
F.16			Water Master Plan	No	OS2223051	Future reservoirs for Pearly Beach	R6 888	Yes	No	No
F.17			Water Master Plan	No	OS2223052	Future reservoirs for Baardskeerdersbos	R1 201	Yes	No	No
F.18	Inadequate water pump station capacity to meet future requirements	Ensure adequate water pump station capacity	Water Master Plan	No	OS2223053	Future pump stations for Buffels River	R4 510	Yes	No	No
F.19			Water Master Plan	No	OS2223054	Future pump stations for Greater Hermanus	R3 663	Yes	No	No
F.20			Water Master Plan	No	OS2223055	Future pump stations for Greater Gansbaai	R16 437	Yes	No	No
F.21			Water Master Plan	No	OS2223056	Future pump stations for Pearly Beach	R693	Yes	No	No
F.22			Water Master Plan	No	OS2223057	Future pump stations for Baardskeerdersbos	R1 765	Yes	No	No
F.23	Water losses and NRW need to be reduced further	Implement WDM infrastructure on internal water reticulation networks	Water Master Plan	No	OS2223058	Future WDM items for Buffels Rivier	R200	Yes	No	No
F.24			Water Master Plan	No	OS2223059	Future WDM items for Kleinmond	R50	Yes	No	No
F.25			Water Master Plan	No	OS2223060	Future WDM items for Greater Hermanus	R700	Yes	No	No
F.26			Water Master Plan	No	OS2223061	Future WDM items for Stanford	R100	Yes	No	No
F.27			Water Master Plan	No	OS2223062	Future WDM items for Greater Gansbaai	R5 985	Yes	No	No
F.28			Water Master Plan	No	OS2223063	Future WDM items for Pearly Beach	R100	Yes	No	No
F.29			Water Master Plan	No	OS2223064	Future WDM items for Baardskeerdersbos	R100	Yes	No	No
F.30			Water Master Plan	No	OS2223065	Future WDM items for Buffeljags Bay	R50	Yes	No	No
F.31	Inadequate capacity of existing bulk and internal sewer drainage network	Ensure adequate bulk and internal sewer drainage capacity	Sewer Master Plan	No	OS2223066	Future bulk and internal sewer drainage network items for Buffels River	R319 062	Yes	No	No
F.32			Sewer Master Plan	No	OS2223067	Future bulk and internal sewer drainage network items for Kleinmond	R64 363	Yes	No	No
F.33			Sewer Master Plan	No	OS2223068	Future bulk and internal sewer drainage network items for Greater Hermanus	R171 151	Yes	No	No
F.34			Sewer Master Plan	No	OS2223069	Future bulk and internal sewer drainage network items for Stanford	R11 432	Yes	No	No
F.35			Sewer Master Plan	No	OS2223070	Future bulk and internal sewer drainage network items for Greater Gansbaai	R259 376	Yes	No	No
F.36			Sewer Master Plan	No	OS2223071	Future bulk and internal sewer drainage network items for Pearly Beach	R47 402	Yes	No	No
F.37			Sewer Master Plan	No	OS2223072	Future bulk and internal sewer drainage network items for	R5 424	Yes	No	No
F.38			Sewer Master Plan	No	OS2223073	Future bulk and internal sewer drainage network items for Buffeljags Bay	R537	Yes	No	No
F.39	Inadequate capacity of existing sewer pump stations	Ensure adequate pump station capacity	Sewer Master Plan	No	OS2223074	Future sewer pump stations for Buffels River	R43 892	Yes	No	No
F.40			Sewer Master Plan	No	OS2223075	Future sewer pump stations for Kleinmond	R1 097	Yes	No	No
F.41			Sewer Master Plan	No	OS2223076	Future sewer pump stations for Greater Hermanus	R15 083	Yes	No	No
F.42			Sewer Master Plan	No	OS2223077	Future sewer pump stations for Stanford	R2 026	Yes	No	No
F.43			Sewer Master Plan	No	OS2223078	Future sewer pump stations for Greater Gansbaai	R55 148	Yes	No	No
F.44			Sewer Master Plan	No	OS2223079	Future sewer pump stations for Pearly Beach	R7 431	Yes	No	No
-	Existing WTW needs to be refurbished	Ensure adequate treatment capacity	WSDP	Yes	-	Refurbish Buffels River WTW Option 1 (Included under Current Needs)	-	Yes	Yes	Yes
F.45	Existing WTW needs to be refurbished	Ensure adequate treatment capacity	WSDP	Yes	OS2223080	Refurbish Kleinmond WTW	R9 780	Yes	Yes	Yes
F.46	Water is currently only disinfected, no WTW	Ensure adequate treatment capacity	WSDP	No	OS2223081	New Buffeljags Bay WTW	R3 000	Yes	No	No
-	Capacity of existing WWTW is inadequate	Ensure adequate treatment capacity	WSDP	Yes	-	Upgraded Kleinmond WWTW Option 1 (Included under Current Needs)	-	Yes	Yes	Yes
-	Existing WWTW needs to be refurbished	Ensure adequate treatment capacity	WSDP	Yes	-	Refurbishment of Kleinmond WWTW (Important and Semi-important priority items)(Included under Current Needs)	-	Yes	Yes	Yes
-	Some components of the WWTW are inadequate	Ensure adequate treatment capacity	WSDP	Yes	-	High priority interventions recommended for the Hermanus WWTW (Included under Current Needs)	-	Yes	Yes	Yes
-	Existing WWTW needs to be refurbished	Ensure adequate treatment capacity	WSDP	Yes	-	Refurbishment interventions for the Hawston WWTW (Priority 1, 2 and 3) (Included under Current Needs)	-	Yes	Yes	Yes
F.47	No sewer dainage network or plant	Ensure adequate treatment capacity	Sewer Master Plan	No	OS2223082	New conservancy tank or package plant for existing erven	R3 500	Yes	No	No
F.48	No sewer dainage network or plant	Ensure adequate treatment capacity	Sewer Master Plan	No	OS2223083	New conservancy tank or package plant for existing erven	R1 500	Yes	No	No
F.49	Capacity of existing WWTW is inadequate	Ensure adequate treatment capacity	WSDP	No	OS2223084	Upgrade Kleinmond WWTW to 3.5 Ml/d	R50 000	Yes	No	No
F.50	Capacity of existing WWTW is inadequate	Ensure adequate treatment capacity	WSDP	No	OS2223085	Upgrade Hawston WWTW to 2.0 Ml/d	R30 000	Yes	No	No
F.51	Capacity of existing WWTW is inadequate	Ensure adequate treatment capacity	WSDP	No	OS2223086	Upgrade Stanford WWTW to 2.0 Ml/d	R20 000	Yes	No	No

Table F.1: WSDP FY2022/23: 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										
Resources										
F.52	Capacity of existing water resources is inadequate to meet projected future water requirements	Ensure yields of existing sources are adequate to meet future water requirements	WSDP	No	OS2223087	Augmentation of Greater Gansbaai existing sources	R30 000	Yes	No	No
F.53	Capacity of existing water resources is inadequate to meet projected future water requirements	Ensure yields of existing sources are adequate to meet future water requirements	WSDP	No	OS2223088	Augmentation of Pearly Beach existing sources	R15 000	Yes	No	No
F.54	Capacity of existing water resources is inadequate to meet projected future water requirements	Ensure yields of existing sources are adequate to meet future water requirements	WSDP	No	OS2223089	3Ml/day Seawater desalination plant (Phase 1)	R90 000	Yes	No	No
F.55	Capacity of existing water resources is inadequate to meet projected future water requirements	Ensure yields of existing sources are adequate to meet future water requirements	WSDP	No	OS2223090	3Ml/day Seawater desalination plant (Phase 2)	R90 000	Yes	No	No
F.56	Capacity of existing water resources is inadequate to meet projected future water requirements	Ensure yields of existing sources are adequate to meet future water requirements	WSDP	No	OS2223091	4Ml/day Seawater desalination plant (Phase 3)	R120 000	Yes	No	No
F.57	Capacity of existing water resources is inadequate to meet projected future water requirements	Ensure yields of existing sources are adequate to meet future water requirements	WSDP	No	Not part of Overstrand Projects	Bulk provision to Hermanus by Overberg Water (Theewaterskloof Dam)	Not part of Overstrand Budget	Yes	No	No
TOTAL: FUTURE NEEDS							**R1 924 902**			