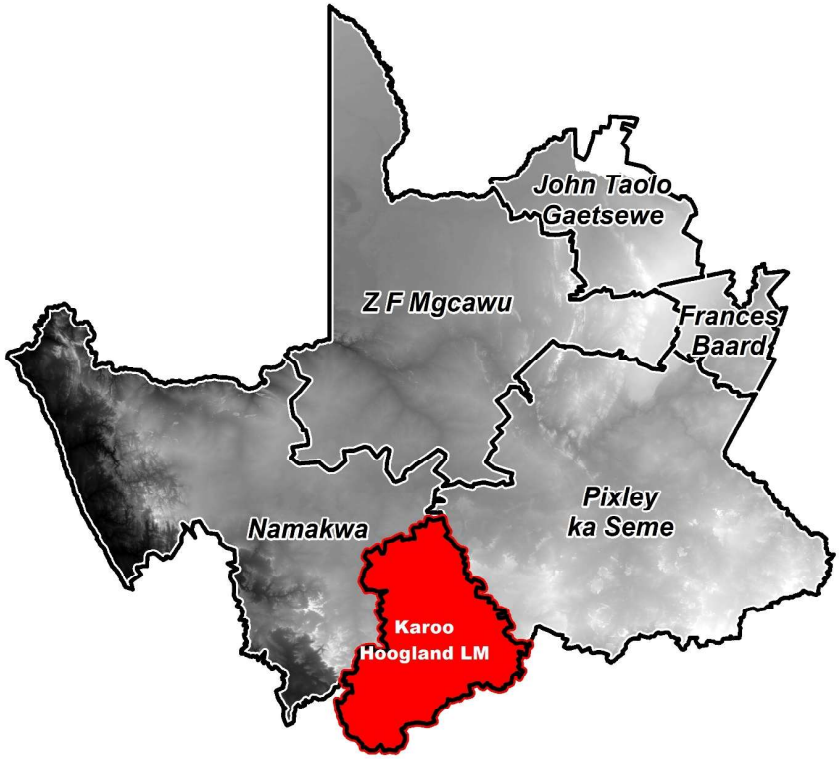
5 YEAR WATER AND SANITATION RELIABILITY SERVICE DELIVERY IMPLEMENTATION PLAN

PHASE 1: SITUATION ASSESMENT REPORT

PHASE 2: PROJECT PIPELINE DEVELOPMENT



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Prepared by:

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IMPROVING LIVES

Namakwa DM

Karoo Hoogland WSA

NORTHERN CAPE PROVINCE

August 2023

5 YEAR WATER AND SANITATION RELIABILITY SERVICE DELIVERY IMPLEMENTATION PLAN

PHASE 1 SITUATION ASSESMENT REPORT

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5 YEAR WATER AND SANITATION RELIABILITY SERVICE DELIVERY IMPLEMENTATION PLAN

PHASE 1 SITUATION ASSESMENT REPORT

INDEX PAGE

ACKNOWLEDGEMENTS & STAKEHOLDER ENGAGEMENT:

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REPUBLIC OF SOUTH AFRICA

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Karoo Hoogland Local Municipality:

Water Services Planning:

- Functionality:
- Water Security:
- Governance:
- New Infrastructure Development Needs:

5 YEAR WATER AND SANITATION RELIABILITY SERVICE DELIVERY IMPLEMENTATION PLAN

PHASE 1 SITUATION ASSESEMENT REPORT

INTRODUCTION PAGE

PURPOSE OF THE DOCUMENT

The purpose of this document is to provide a comprehensive implementation plan to achieve reliable water services for the Water Services Authority (WSA) within a period of five years.

The focus is on reliable and sustainable service delivery. It is about actions, a "pipeline of projects" to achieve reliable services. It requires dedicated implementation by all sector role players and stakeholders. It is urgent and must achieve differential success in the committed time frame of five years It is a must-do turn-around plan to become viable, resilient and self-sustaining WSAs.

MANDATE

MTSF 2019-2024: Programme Basic Services Delivery (page 183)

Outcome: Improved capacity to deliver basic services
Indicator: Reliability of water services 95%
Intervention: Develop District Municipalities Five Year Reliability Plans
Responsible institution in MTSF for development of Five-Year plans is **DWS**

District Development Model (Concept note dated August 2019)

Page 13: The existing portfolio of infrastructure projects needs to be package. A credible project pipeline must be developed.
Page 15: Reporting protocols on how data is collected, consolidated, validated and verified for credibility
Page 16: All plans must be spatial referenced, and projects must be linked on how, why and by when
Page 17: Consolidating a better understanding of community needs per DM
Page 18: Priorities over 5-year term period
Page 22: All grants to be allocated to one plan

Strategic development Goals (SDG)

In the year 2000, the South African Government, along with other members of the United Nations (UN), committed to a National and Global plan of action to reduce poverty and ensure the development of its people.

The SGD goals and targets came into effect on 1 January 2016 and would guide the decisions taking over the next fifteen years. "SDG 6 Biennial Progress Report."

SDG 6 in particular was given to the DWS. The Department has been busy implementing the program since its inception.

6.1, Achieve universal and equitable access to safe and affordable drinking water for all

6.2, Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

OBJECTIVE

The first objective is to develop a Water & Sanitation Services Situational Assessment of the current services levels referenced to households at community level.

The second objective is to use the situational assessment information knowledge base which is then interpreted into a Needs Perspective that categorize each supply need and gap analysis into a reliability category with regards to:

- **Functionality** – Situation and needs
- **Water Security** (Including WCWDM) – Situation and needs
- **Governance**
- **New Infrastructure Development Needs**

Project are then identified to address each of the Reliability Needs Classification Categories, and a funding model developed that enables a Five-Year pipeline of Project Implementation Plan that integrates all grant funding.

FIVE YEAR RELIABILITY DEVELOPMENT PLAN ACTION FLOW

Develop a Five-Year plan document to calculate reliability from situational assessment
Identify interventions required to address reliability
WSA approval and buy-in into process and structures
Develop project identification and implementation streams for

- **Functionality**
- **Water Security**
- **Governance**
- **New Infrastructure Development Needs**

Develop financial model integrating all grant funding
Develop pipeline of projects for Five-Year Implementation Period
Monitor implementation compliancy related to alleviation of reliable services

STRUCTURE OF A FIVE-YEAR WATER AND SANITATION RELIABILE IMPLEMENTATION PLAN

Determine and confirm the Situational Assessment:
Unserved, Underserved, Refurbish/Recover/Replace, Aged Infrastructure, O&M/Functionality, Water Security, WSA Governance
Do a complete backlog Interpretation Report
Align existing needs to existing project matric=x summary
Complete project needs perspective related to:

- **Functionality**
- **Water Security**
- **Governance**
- **New Infrastructure Development Needs**

Develop a financial model to include integration of all funding streams for the five year process
Outcome = Pipeline of Projects

5 YEAR WATER AND SANITATION RELIABILITY SERVICE DELIVERY IMPLEMENTATION PLAN

PHASE 1 SITUATION ASSESEMENT REPORT

INTRODUCTION PAGE

RELIABILITY OF WATER SERVICES

Definition Of Reliability Services: An un-interrupted supply for 90% of the time through a fully functional infrastructure system which is operated and maintained to set standards supported by an effective Governance institution that provides an acceptable quality of water supply that is based on sustainable water security principles.

Reliable water supply is subject to many factors including the following:

- **Adequate water resources** and associated storage to supply water at the required level of assurance (e.g. 98% for domestic use) across seasons and climate variation.
- **Adequately sized, functional water infrastructure** to distribute water from sources to users and manage sanitation and wastewater for sustained human and environmental health.
- **Water and wastewater treatment** to comply with user specific water quality requirements.
- **Continuous and efficient operation** and management of water supply processes from source-to-tap-to-source by the responsible institutions with required skills, capacity and accountability.
- **Responsible water uses** by households, business and industries in compliance with water use payment, water conservation, water demand management and wastewater regulations.
- **Infrastructure asset management** to maintain functional and efficient water services infrastructure, plan for future upgrade needs and schedule renewal of aged infrastructure.
- **Financial management** (budgeting, financing, revenue collection & expenditure accounting) to ensure that there is adequate funding for efficient and reliable water services delivery.
- **Disaster and risk management** to mitigate the impacts of unexpected water-related risks.
- **Good governance** (leadership, planning, regulation, organising and control).
- **Political will, guidance and support** (centrality of water; outcome targets).

Key challenges are:

- **limited water** resources and climate change affecting water security
- **access to infrastructure** in rural areas and informal settlements
- **aged infrastructure** and backlogs in maintenance and refurbishment
- **water losses** due to poor infrastructure maintenance
- **revenue collection** and funding not meeting requirements for sustainable services

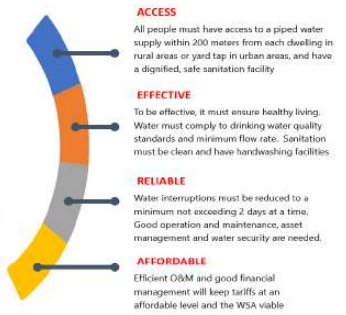
The Water Services Obligation

Access to water supply services is a basic human right and this is enshrined in the Constitution of South Africa. This is furthermore reflected in the National Water Services Act, 1997 (Act No. 108 of 1997), the National Development Plan and the recent global Sustainable Development Goals (Goal 6.1) committed to by the Head of State on 25 September 2015.

The water services obligation is:

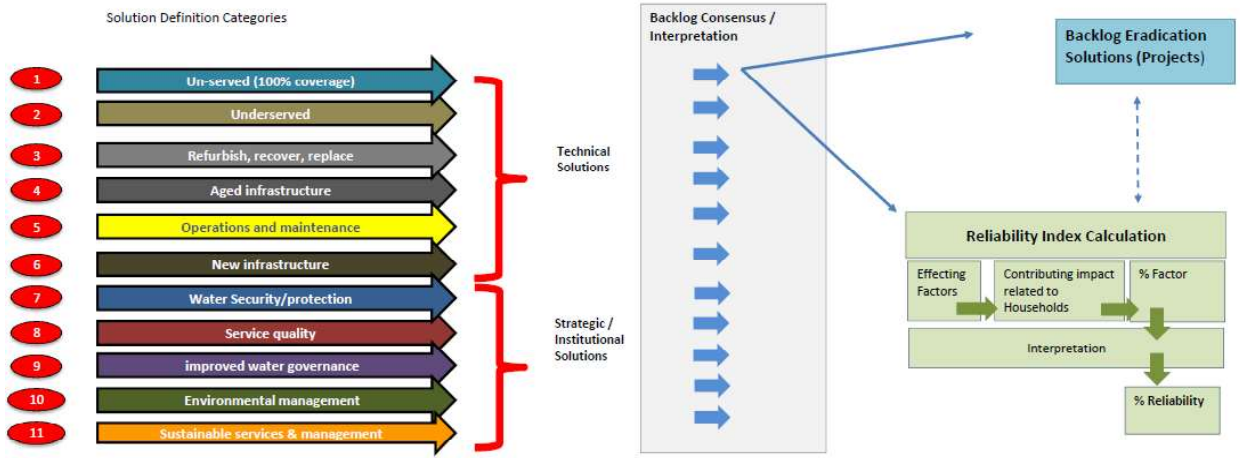
"To ensure that all people in South Africa have access to effective, reliable, affordable and sustainable water services".

Water supply is an essential service to ensure and facilitate social and economic development, business security and environmental health. Lack thereof has serious social, economic, environmental, health and security risks. We therefore must *ensure* that effective, reliable and affordable water services are provided to support economic growth and sustain a healthy and productive living for all South Africans.



Successful achievement of the required outcome requires good **Management** and **Governance**. The municipality and water service providers need the *right skills, adequate capacity, appropriate experience, institutional arrangements, processes and procedures, tools and equipment* to perform efficiently and timeously.
They also need adequate **Funding** which needs to be achieved on a sustainable basis through revenue collection and effective financial management, cost efficiency, proactive saving and investment.
This Intervention Framework is implemented through the following five workstreams:

Reliability Components



1 GENERAL OVERVIEW

WSA = Karoo Hoogland LM
Urban Centres:
Fraserburg
Sutherland
Williston

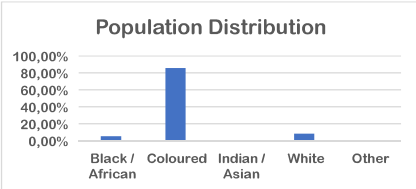
2 WSA POPULATION DISTRIBUTION

Total Population 2022:	**8 229**
Total Number of Households 2022:	**2 359**
Average household Size:	3,5
Total Area: ha	3227400
Population Density: people per ha	0,003

3 STATS SA POPULATION COMPOSITION

Population Group	% of Total Population
Black / African	5,30%
Coloured	85,60%
Indian / Asian	0,50%
White	8,10%
Other	

POPULATION GROUP DISTRIBUTION - COLUMN CHART

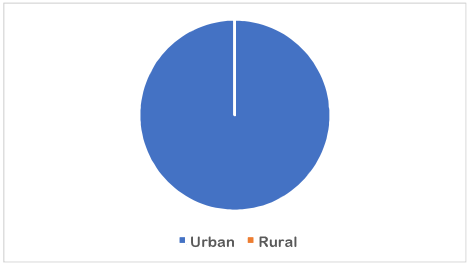


4 SETTLEMENT TYPE DISTRIBUTION

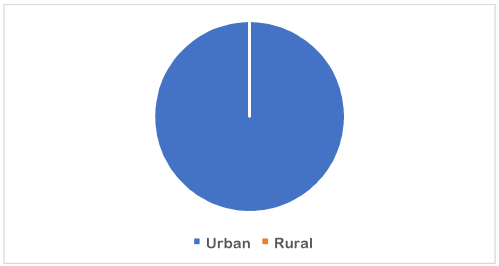
MAIN TYPES: URBAN / RURAL (2016)

WSA	Main Type	Settlements	Households	Population
Karoo Hoogland LM	Urban	5	2 359	8 229
Karoo Hoogland LM	Rural	-	-	-

PIE CHART - SETTLEMENT



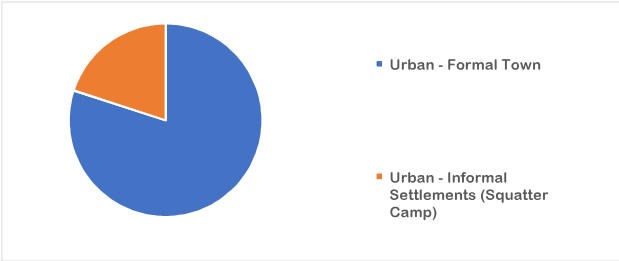
PIE CHART - POPULATION



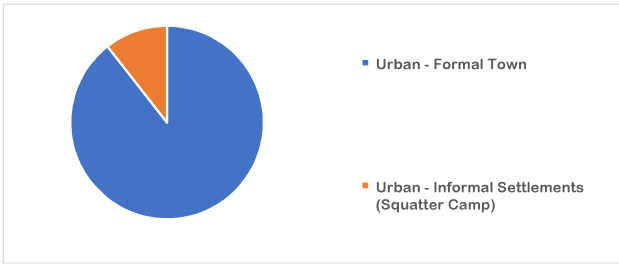
SETTLEMENT TYPES (2016)

Settlement Type	Settlements	Households	Population
Metropolitan Area			
Urban - Formal Town	4	2 117	7 358
Urban - Former Township			
Rural - Dense Villages > 5000			
Rural - Small Villages <= 5000			
Rural Scattered			
Rural Scattered Dense			
Rural Scattered Low Density			
Rural Scattered Very Low Density			
Farming (People living on farms)			
Urban - Informal Settlements (Squatter Camp)	1	242	871
Rural - Informal Settlements (Squatter Camp)			
Working Towns and Service Centres - Mines, Prisons, etc.			
Unknown			
TOTAL	**5**	**2 359**	**8 229**

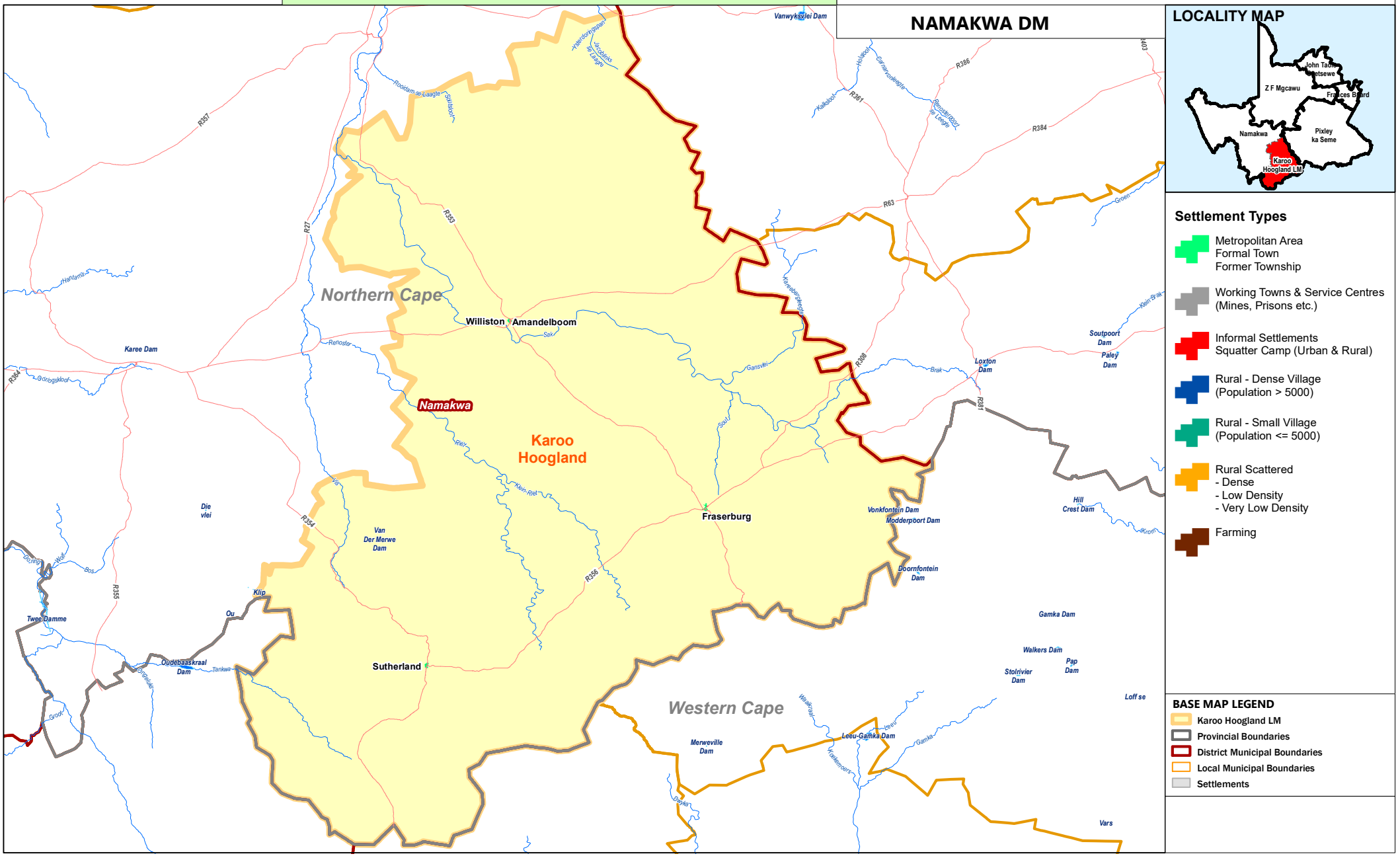
PIE CHART - SETTLEMENTS



PIE CHART - POPULATION



1.1.2 Settlement Types and Distribution



LOCALITY MAP

Settlement Types

- Metropolitan Area
  Formal Town
  Former Township
- Working Towns & Service Centres
  (Mines, Prisons etc.)
- Informal Settlements
  Squatter Camp (Urban & Rural)
- Rural - Dense Village
  (Population > 5000)
- Rural - Small Village
  (Population <= 5000)
- Rural Scattered
  - Dense
  - Low Density
  - Very Low Density
- Farming

BASE MAP LEGEND

- Karoo Hoogland LM
- Provincial Boundaries
- District Municipal Boundaries
- Local Municipal Boundaries
- Settlements

Karoo Hoogland LM

Source: IDP2023/24

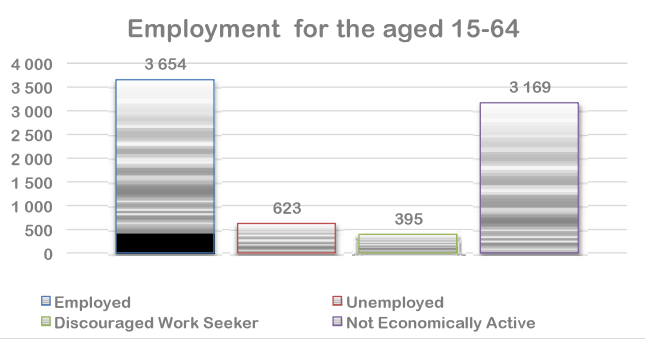
SUMMARY DESCRIPTION OF THE DEMOGRAPHIC OVERVIEW

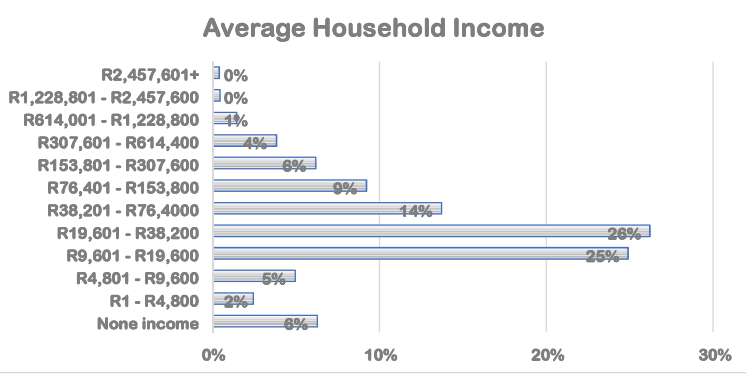
Karoo Hoogland is situated in the most Southern part of the Northern Cape and falls within the area of jurisdiction of Namaqua District Municipality with its head office located in Springbok. The three main towns in Karoo Hoogland are Williston, Fraserburg and Sutherland which are respectively 499 km, 592 km and 539 km from Springbok.

The Karoo Hoogland Municipality was established in 2000 as category B Municipality as determined in terms of municipal structures act (1998). The Karoo Hoogland Municipality has collective executive system as contemplated in section 2(a) of the Northern Province Determination of types of Municipalities Act (2000).

The Karoo Hoogland is predominantly rural in nature with a high unemployment rate resulting in high poverty levelsand is linked with many other places through shared environmental, social and economic systems and structures

The WSA's Settlements, although Formal Urban Centres are Rural in nature, the result in the Municipality will be to continue to provide a higher level of service to its consumers. Ageing infrastrucrure and operation and maintenance could impact to delivery of reliable water services within the WSA





Improvement in Settlement footprint

The National Project Manager indicated during inception that the CSIR embarked on identify dwelling or structures from satellite imagery. These dwellings were then ring-fenced to draw a footprint of a settlement boundary from where a population figure was calculated per settlement footprint area. The CSIR data was used to compare it with the DWS settlement and demographic dataset. Apart from the population figures, the DWS settlement boundaries were also evaluated against the CSIR footprint boundary. The result of the alignment investigation was that the DWS figures were in most cases found to be reliable and was subsequently confirmed by the WSA too.

However, the DWS settlement footprints were improved as the settlements were split into more detail to present settlement information in urban areas on suburb level. The aforementioned then enabled a more detailed breakdown of demographic and level of services per settlement.

There was no change in the number of settlements, however the settlement count will be higher due to the fact that many settlements were broken down into suburb level

The urban rural split is detailed per settlement below and confirms the urban nature of the WSA.

Urban / Rural	Settlement Type	Settlement Name	No of Households	No of People
Urban	Urban - Formal Town	Amandelboom	716	2448
Urban	Urban - Formal Town	Fraserburg	610	2196
Urban	Urban - Formal Town	Sutherland	630	2268
Urban	Urban - Formal Town	Williston	161	446
Urban	Urban - Informal Settlements (Sc	Fraserburg	242	871
Totals			2359	8229

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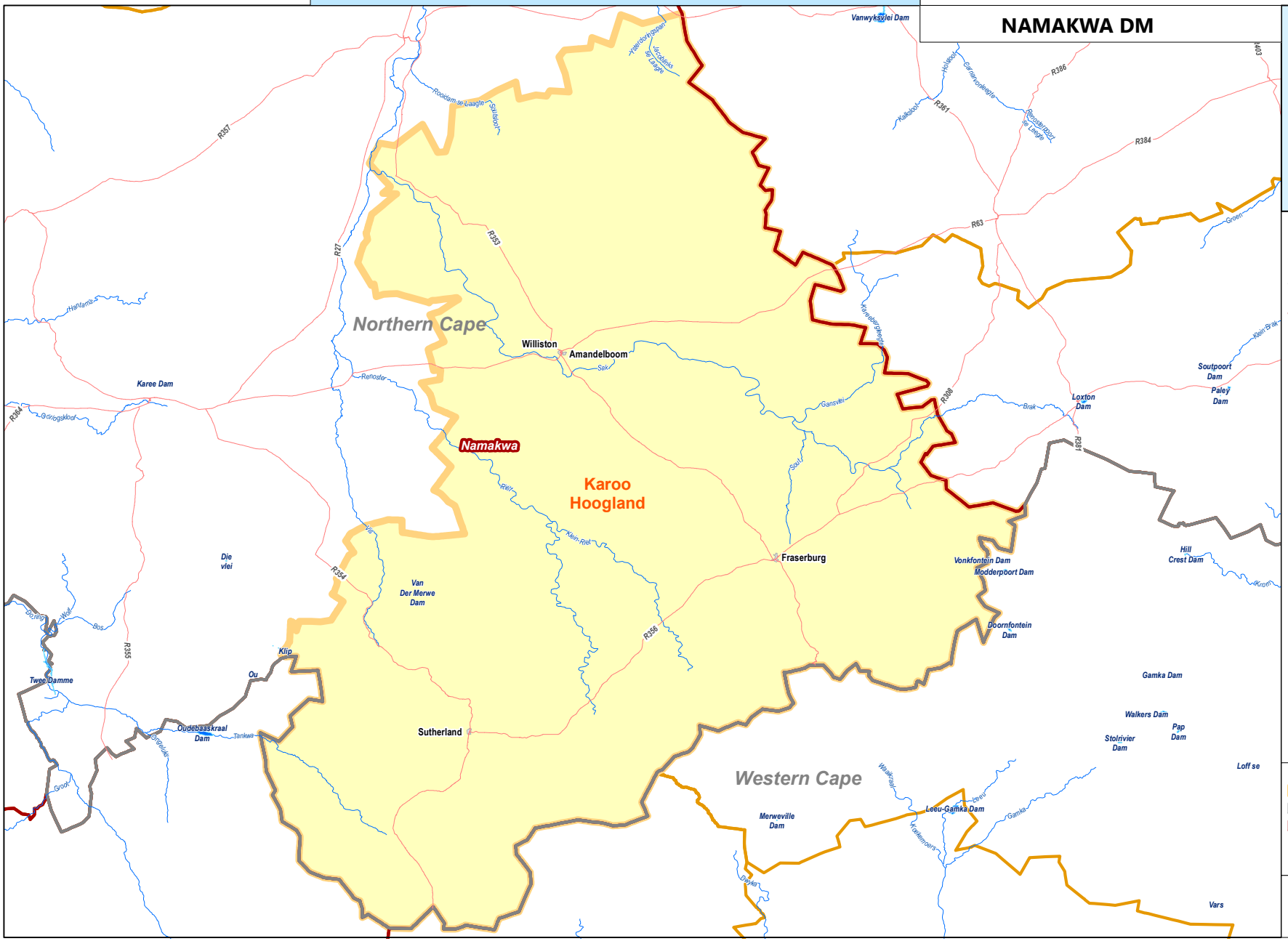
2. CURRENT SUPPLY STATUS

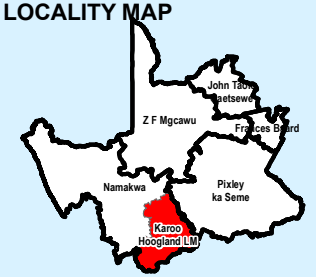
2.1 WATER SERVICES LEVELS

2.1.1 Under Served

Settlements requiring extension to existing infrastructure



LOCALITY MAP



KAROO HOOGLAND LM

Total Households: 2 359
Total Population: 8 229

WATER UNDER SERVED

Settlements requiring extension to existing infrastructure

WATER UNDER SERVED Settlements requiring extension to existing infrastructure	
Households	Population
0	0
Affected Settlements	
0	

None of the settlements require extensions to existing infrastructure

BASE MAP LEGEND

- Karoo Hoogland LM
- Provincial Boundaries
- District Municipal Boundaries
- Local Municipal Boundaries
- Settlements

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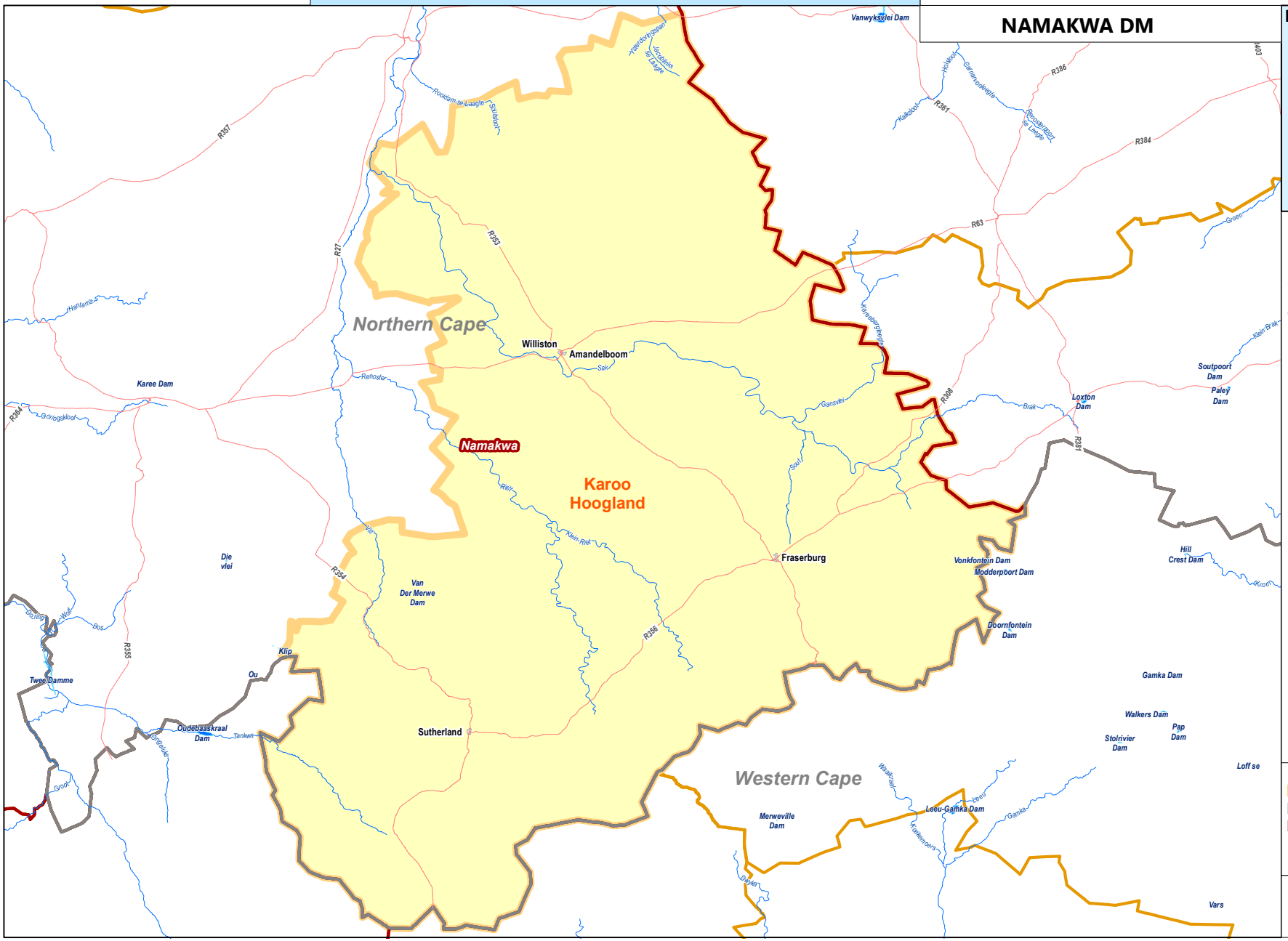
2. CURRENT SUPPLY STATUS

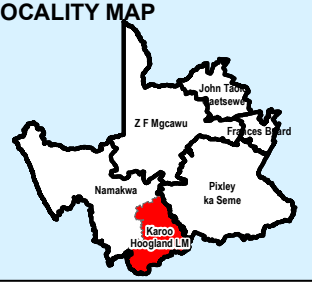
2.1 WATER SERVICES LEVELS

2.1.2 Unserved (None)

Settlements having no formal water infrastructure



LOCALITY MAP



KAROO HOOGLAND LM

Total Households: 2 359
Total Population: 8 229

WATER UNSERVED: LOCAL SOLUTION

Settlements having no formal water infrastructure

WATER UNSERVED (LOCAL SOLUTION) Settlements having no formal water infrastructure	
Households	**Population**
0	0
Affected Settlements	
0	

None of the settlements are affected by not having access to any formal water infrastructure

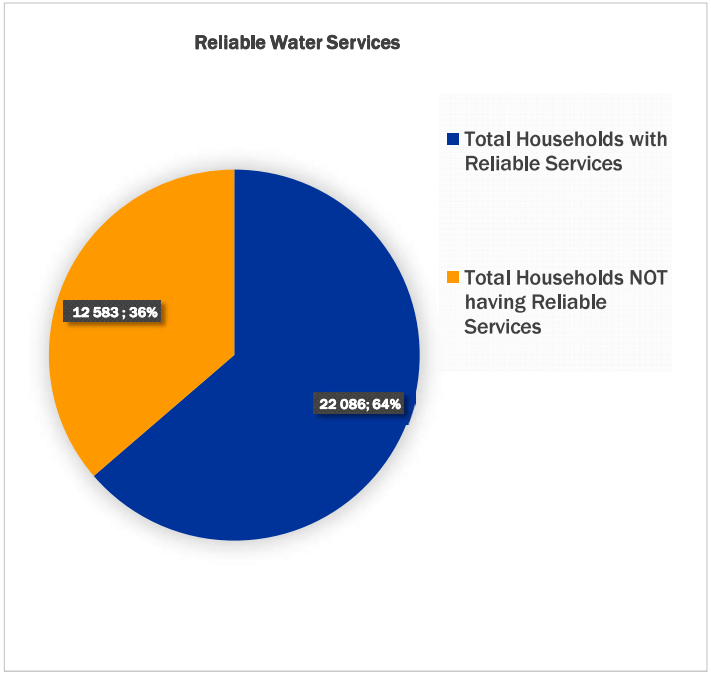
BASE MAP LEGEND

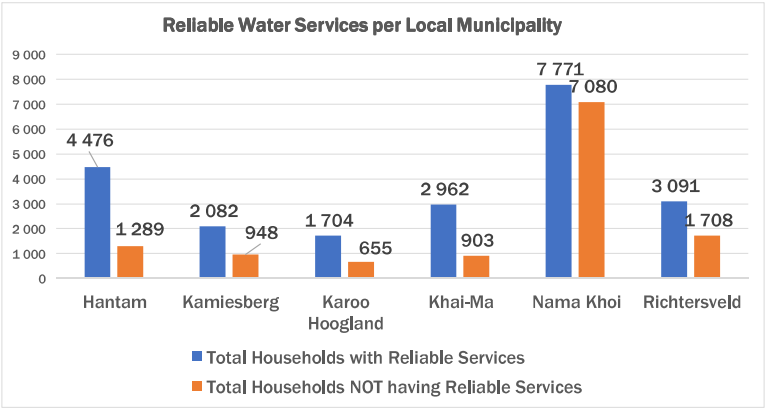
- Karoo Hoogland LM
- Provincial Boundaries
- District Municipal Boundaries
- Local Municipal Boundaries
- Settlements

Water Reliability Service Status

Namakwa Water Reliability Calculation and Process

DMName	LMName	Total Settlements	Total Households	Total Households with Reliable Services	%	Total Households NOT having Reliable Services	%
Namakwa	Hantam	10	5 765	4 476	78%	1 289	22%
Namakwa	Kamiesberg	21	3 030	2 082	69%	948	31%
Namakwa	Karoo Hoogland	5	2 359	1 704	72%	655	28%
Namakwa	Khai-Ma	8	3 865	2 962	77%	903	23%
Namakwa	Nama Khoi	24	14 851	7 771	52%	7 080	48%
Namakwa	Richtersveld	12	4 799	3 091	64%	1 708	36%
TOTAL Namakwa DM		**80**	**34 669**	**22 086**	**64%**	**12 583**	**36%**





THE RELIABILITY CALCULATION PROCESS

The process to determine a reliability value is based on evaluating each settlement with regards to the number of households not having a reliability service due to one or more of the reliability categories. For each of the reliability categories, a specific field in the Geodatabase was created and each field must be populated with the number of households of the settlement affected by the specific category. A household can be affected by more that one category and must then be listed in every field where applicable. The number of households entered may not exceed the total households for each settlement. The reliability fields are:

Total Number of Households NOT having Reliable Service due to:

- Functionality (O&M and Management)
- Resource
- Infrastructure
- Conservation & Demand Management
- New Source
- Infrastructure – UPGRADE/REFURBISHMENT
- Infrastructure – EXTENSION
- Infrastructure – NEW SCHEME

Due to the fact that a settlement may have more than one reliability cause and therefore can be listed in more than one of the above categories, summarizing the effected households from these fields will result in double counting and a total household of more than the total of households of the settlement. The presentation of each field individually will be accurate, but a summary of the fields will be inaccurate due to double counting. To address the double counting, additional fields were added to describe the following 2 categories

- Total Number of Households having Reliable Service. (Interpret Direct Backlog)
- Total Number of Households NOT having Reliable Service. (Interpret Direct Backlog)

These 2 fields must be calculated by interpreting the reliability fields to ensure that if a household is occurring in more than one category, it only gets counted once therefore ensure that the figure presents a total household of settlement with a water reliability need irrelevant the type of need. The type of need can be identified from the individual need fields, and a total reliability need can then be obtained from Total Reliability Service need field. This figure then presents the Water Reliability Calculated figure and percentage

Definition Of Reliability Services: An un-interrupted supply for 90% of the time through a fully functional infrastructure system which is operated and maintained to set standards supported by an effective Governance institution that provides an acceptable quality of water supply that is based on sustainable water security principles.

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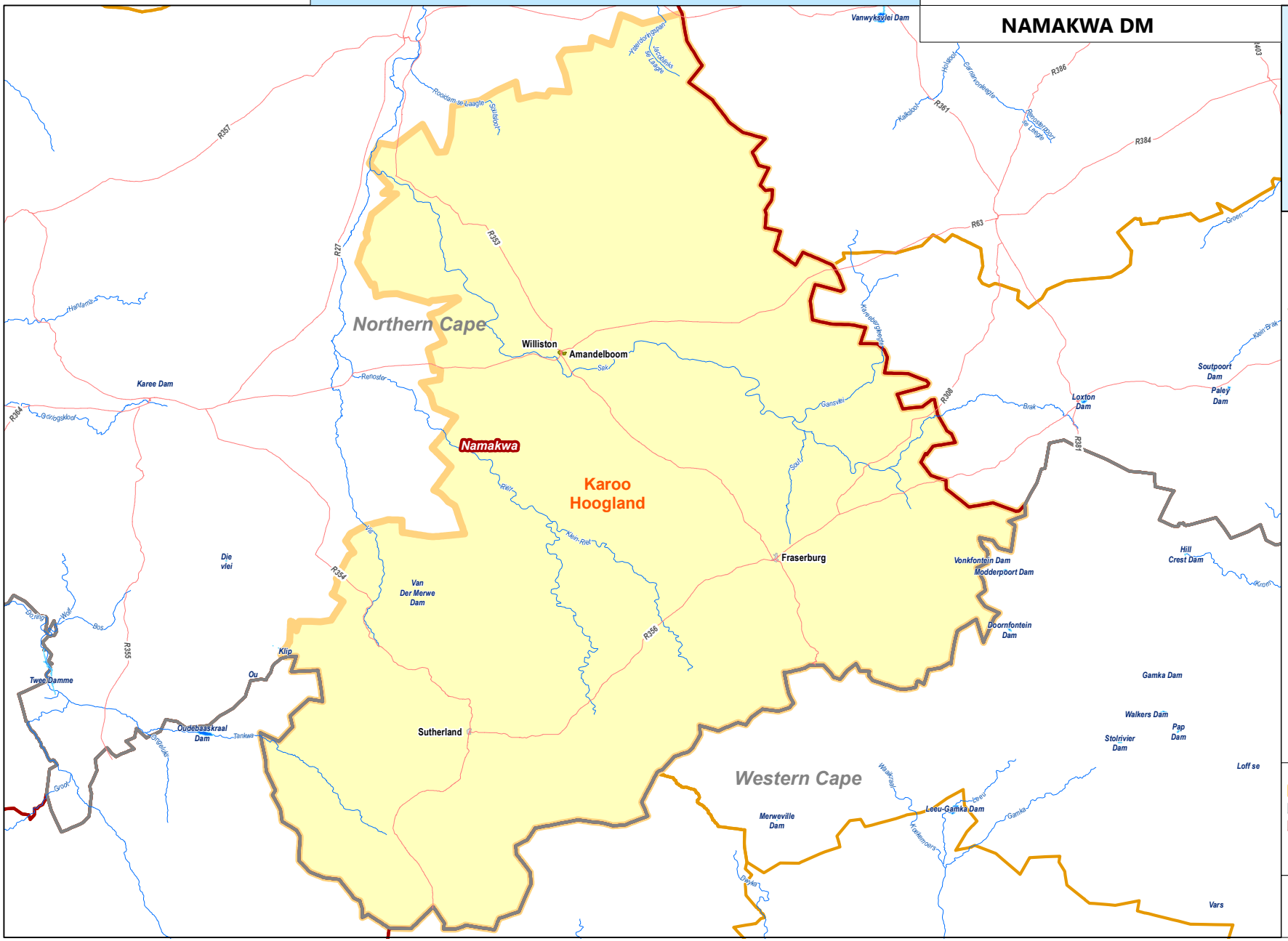
2. CURRENT SUPPLY STATUS

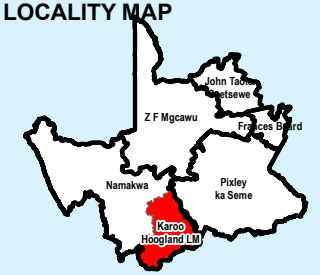
2.1 WATER SERVICES LEVELS

2.1.3.1 Water Reliability Service Status

Settlements requiring functionality interventions



LOCALITY MAP



KAROO HOOGLAND LM

Total Households: 2 359
Total Population: 8 229

FUNCTIONALITY NEED

Settlements with access to infrastructure but inadequate supply because of functionality issues

FUNCTIONALITY Settlements requiring functionality interventions	
Households	**Population**
237	777
Affected Settlements	
2	

BASE MAP LEGEND

- Karoo Hoogland LM
- Provincial Boundaries
- District Municipal Boundaries
- Local Municipal Boundaries
- Settlements

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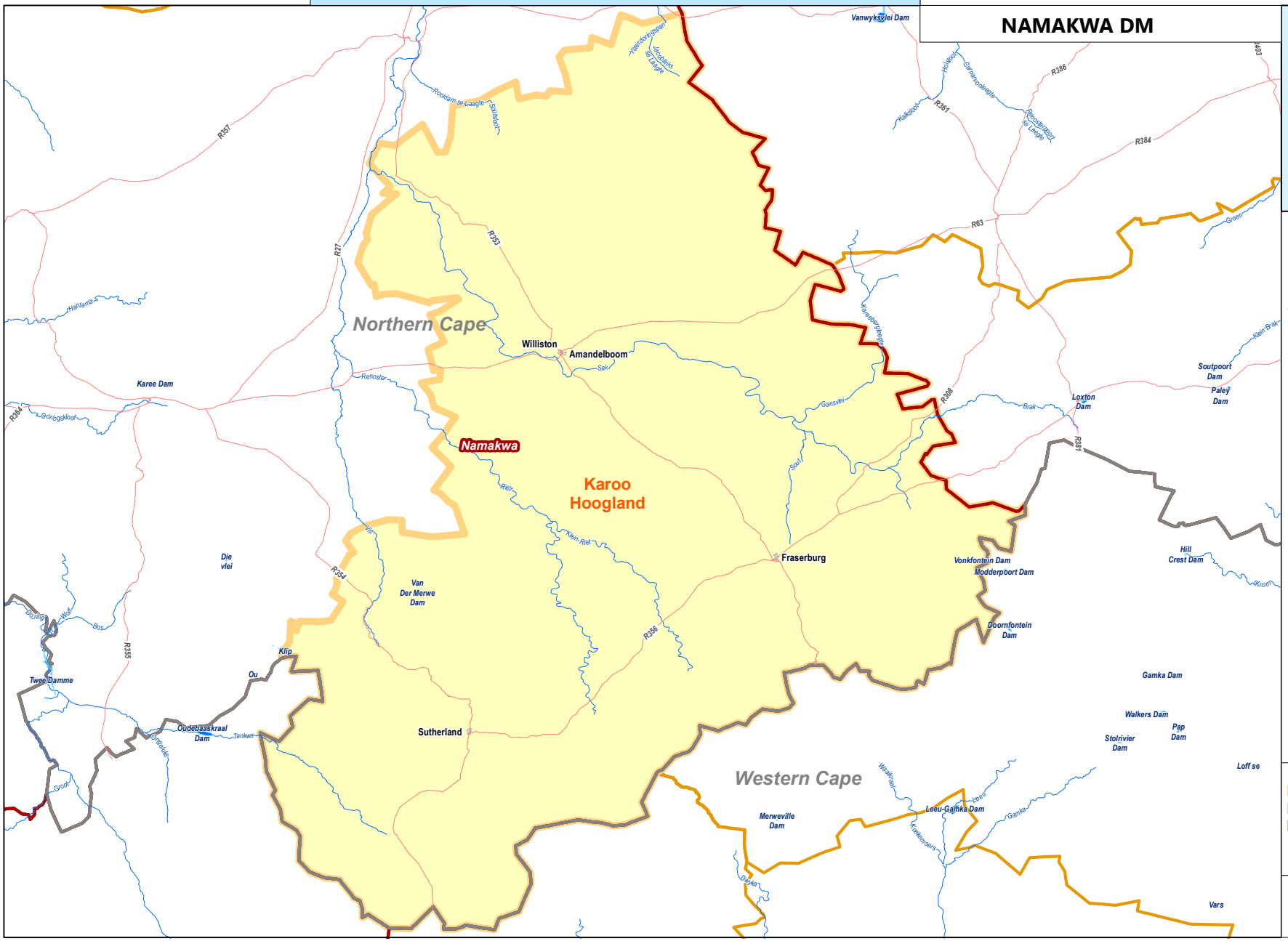
2. CURRENT SUPPLY STATUS

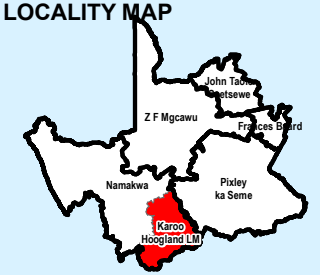
2.1 WATER SERVICES LEVELS

2.1.3.2 Water Reliability Service Status

Settlements requiring replacement of old existing infrastructure



LOCALITY MAP



KAROO HOOGLAND LM

Total Households: 2 359
Total Population: 8 229

REPLACEMENT NEED

Settlements with access to infrastructure but inadequate supply because of infrastructure to be replaced

REPLACEMENT OLD Settlements requiring replacement of old existing infrastructure	
Households	**Population**
0	0
Affected Settlements	
0	

None of the settlements are affected by requiring replacement of old existing infrastructure

BASE MAP LEGEND

- Karoo Hoogland LM
- Provincial Boundaries
- District Municipal Boundaries
- Local Municipal Boundaries
- Settlements

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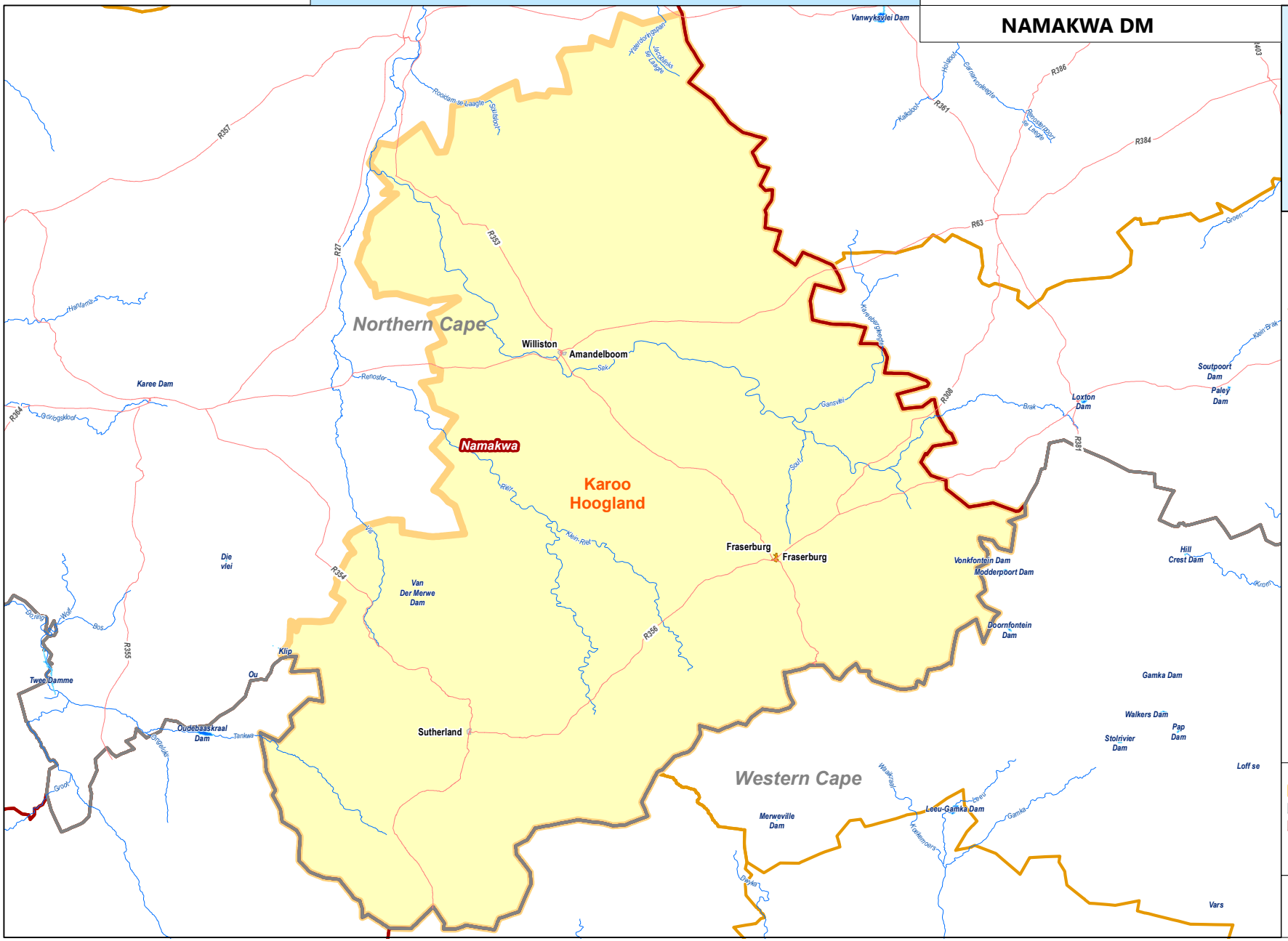
2. CURRENT SUPPLY STATUS

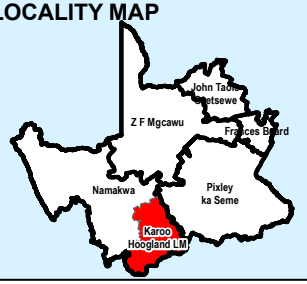
2.1 WATER SERVICES LEVELS

2.1.3.3 Water Reliability Service Status

Settlements requiring upgrades / refurbishment to existing infrastructure



LOCALITY MAP



KAROO HOOGLAND LM

Total Households: 2 359
Total Population: 8 229

UPGRADE / REFURBISHMENT NEED

Settlements with access to infrastructure but inadequate supply because of upgrade/ refurbishment needs

UPGRADE / REFURBISHMENT NEED Settlements requiring upgrades/ refurbishment to existing infrastructure	
Households	**Population**
277	997
Affected Settlements	
2	

BASE MAP LEGEND

- Karoo Hoogland LM
- Provincial Boundaries
- District Municipal Boundaries
- Local Municipal Boundaries
- Settlements

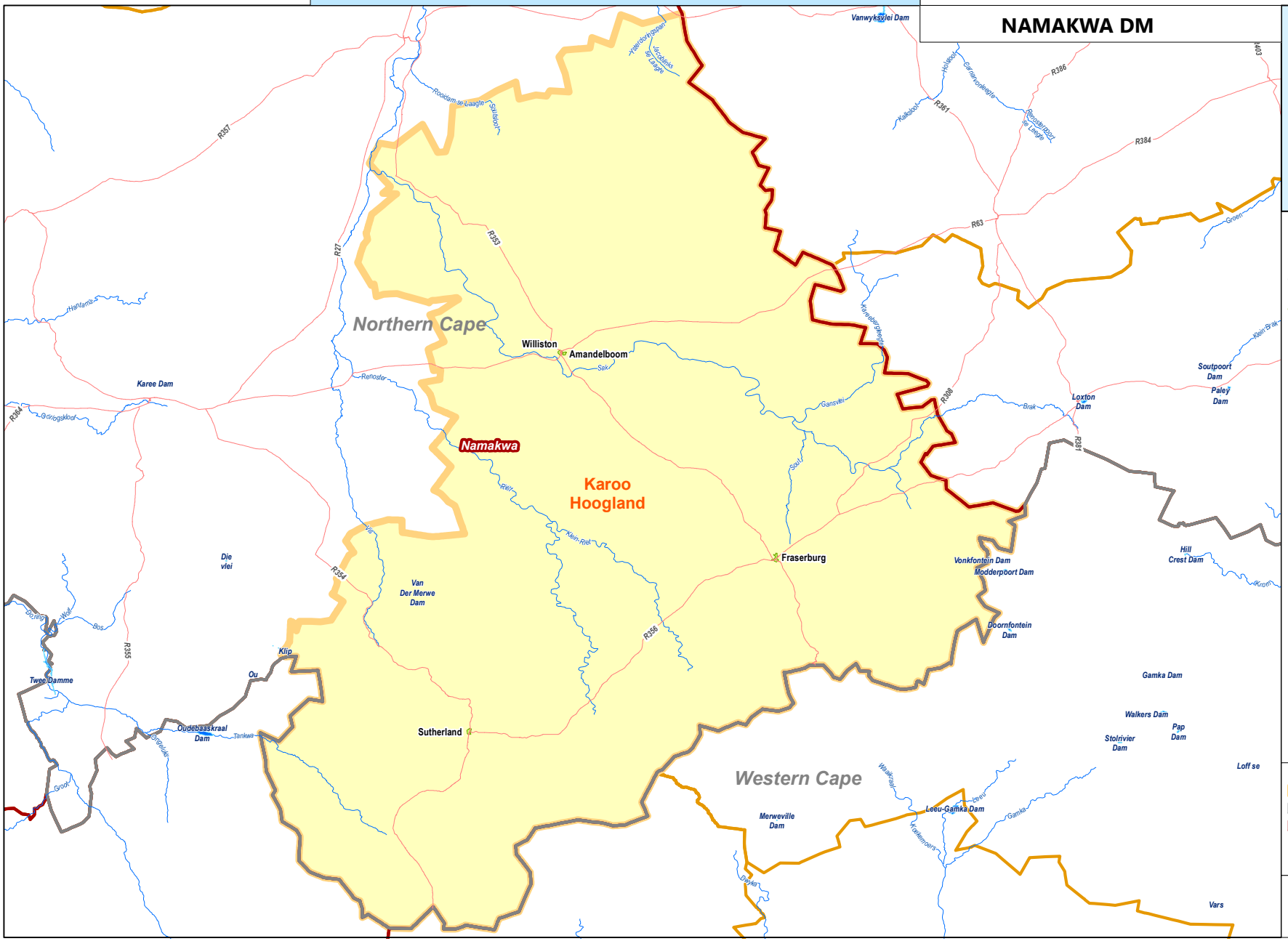
water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2. CURRENT SUPPLY STATUS

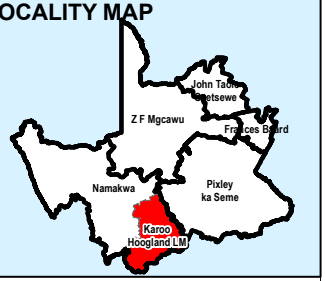
2.1 WATER SERVICES LEVELS

2.1.3.4 Water Reliability Service Status

Settlements requiring water conservation & demand management interventions



LOCALITY MAP



KAROO HOOGLAND LM

Total Households: 2 359
Total Population: 8 229

WC&DM NEED

Settlements with access to infrastructure but inadequate supply because of water conservation & demand management not implemented

WATER CONSERVATION & WATER DEMAND Settlements requiring water conservation & water demand interventions	
Households	Population
580	2 012
Affected Settlements	
4	

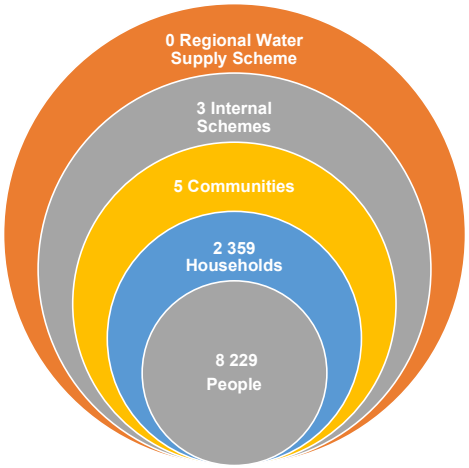
BASE MAP LEGEND

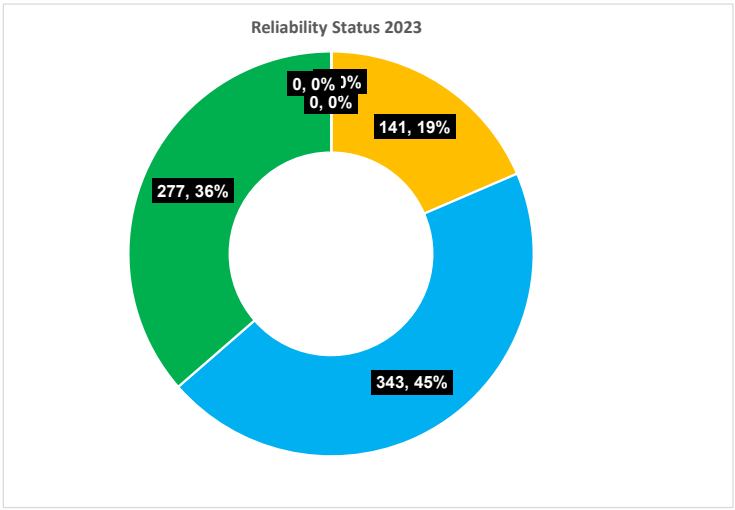
- Karoo Hoogland LM
- Provincial Boundaries
- District Municipal Boundaries
- Local Municipal Boundaries
- Settlements

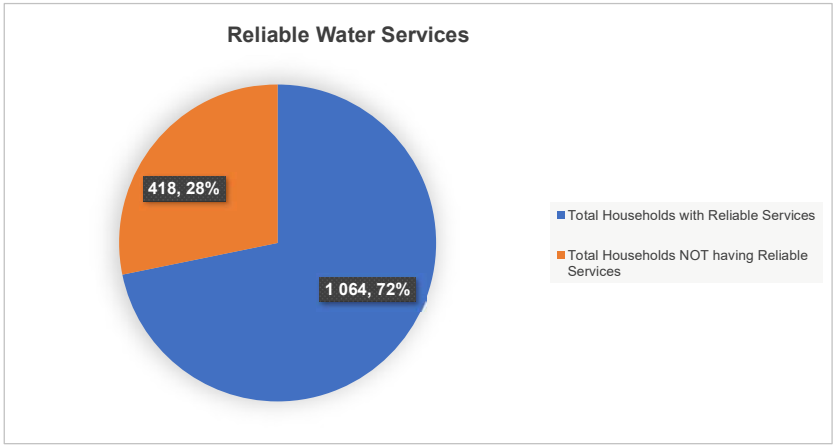
2.1.3.5 Water Reliability Service Status

Summary Description
Water Reliability Service Status - Summary
Karoo Hoogland LM

DMName	LMName	Total Settlements	Total Households	Total Households with Reliable Services	%	Total Households NOT having Reliable Services	%
Namakwa	Karoo Hoogland LM	3	1 482	1 064	72%	418	28%







Definition Of Reliability Services: An un-interrupted supply for 90% of the time through a fully functional infrastructure system which is operated and maintained to set standards supported by an effective Governance institution that provides an acceptable quality of water supply that is based on sustainable water security principles.

Water Scheme Number	Water Scheme Name	Total Settlements	Total Households	Total Population	Households with Reliable Services	Households without Reliable Services	Households NOT having Reliable Service due to: Functionality (O&M and Management)	Households NOT having Reliable Service due to: Resource	Households NOT having Reliable Service due to: Resource - Conservation & Demand Management	Households NOT having Reliable Service due to: Infrastructure – UPGRADE/REFURBISHMENT	Households NOT having Reliable Service due to: Infrastructure – NEW SCHEME	Households NOT having Reliable Service due to: Infrastructure – EXTENSION	Households NOT having Reliable Service due to: REPLACE OLD
S03D55E001	FRASERBURG	1	610	2 196	408	202	-	-	202	202	-	-	-
S03D55E001A	FRASERBURG	1	242	871	167	75	-	-	-	75	-	-	-
S03D51A001	SUTHERLAND	1	630	2 268	489	141	-	141	141	-	-	-	-
S03D55L001	WILLISTON	2	877	2894	640	237	237	-	237	-	-	-	0

2.1.3.6 Water Reliability Service Status

Summary Description

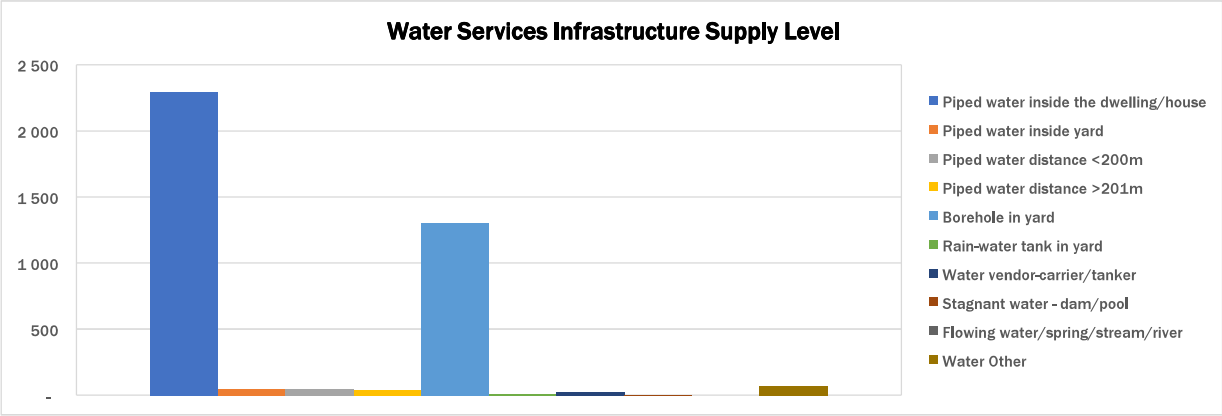
Karoo Hoogland LM **Water Reliability Service Status -Detail per Settlement listing reliability needs**

Please refer to Appendix A comprising of the proposed infrastructure project solutions per settlement per reliability category. Kindly also take note that upgrading of bulk water or sanitation supply projects address the upgrading / augmentation / extension of treatment, storage and distribution.

Settlement Code	Settlement Name	Total Households	Households with Reliable Services	Households with No Reliable Services	Households NOT having Reliable Service due to: Functionality (O&M and Management)	Households NOT having Reliable Service due to: Resource	Households NOT having Reliable Service due to: Resource - Conservation & Demand Management	Households NOT having Reliable Service due to: Infrastructure – UPGRADE/REFURBISHMENT	Households NOT having Reliable Service due to: Infrastructure – EXTENSION	Households NOT having Reliable Service due to: Infrastructure – NEW SCHEME	Households NOT having Reliable Service due to: REPLACE OLD	Need (s)
03D55L001_A	Amandelboom	716	531	185	X		X					O&M WC&DM
03D55E001	Fraserburg	610	408	202			X	X				WC&DM Upgrade/Refurbish Infrastructure
03D55E001_A	Fraserburg	242	167	75				X				Upgrade/Refurbish Infrastructure
03D51A001	Sutherland	630	489	141		X	X					Resource WC&DM
03D55L001	Williston	161	109	52	X		X					O&M WC&DM

HOUSEHOLD & POPULATION: Water Service Infrastructure Supply Level Profile
List per Local Municipality: Karoo Hoogland LM

Infrastructure Supply Level	Karoo Hoogland LM	
	Households	%
Piped water inside the dwelling/house	2 297	60,0
Piped water inside yard	41	1,1
Piped water distance <200m	46	1,2
Piped water distance >201m	37	1,0
Borehole in yard	1 300	34,0
Rain-water tank in yard	11	0,3
Water vendor-carrier/tanker	23	0,6
Stagnant water - dam/pool	2	0,1
Flowing water/spring/stream/river	-	-
Water Other	72	1,9
Total	3 829	



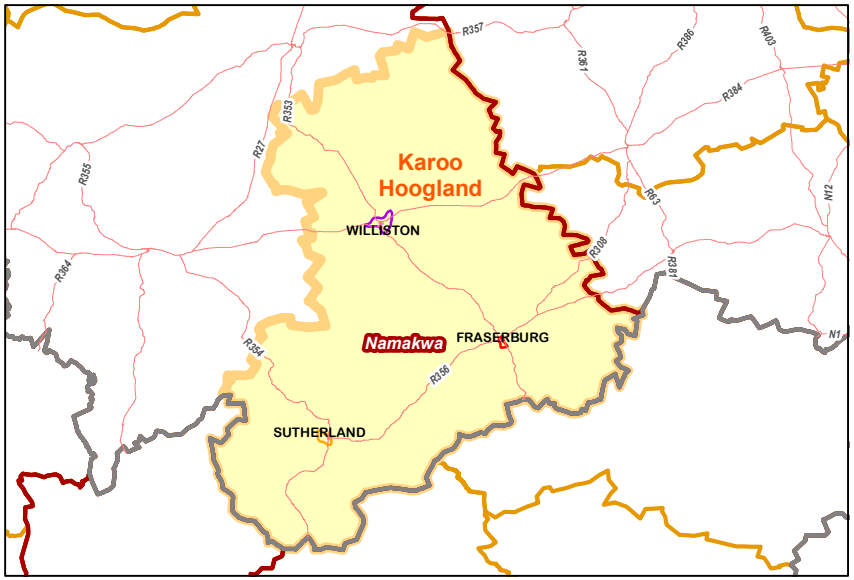
Note: The above table refers to Stats Community Survey 2016 figures and the water service level figures presented in 2.1.3.5 have been verified with the WSA therefore the difference in totals.

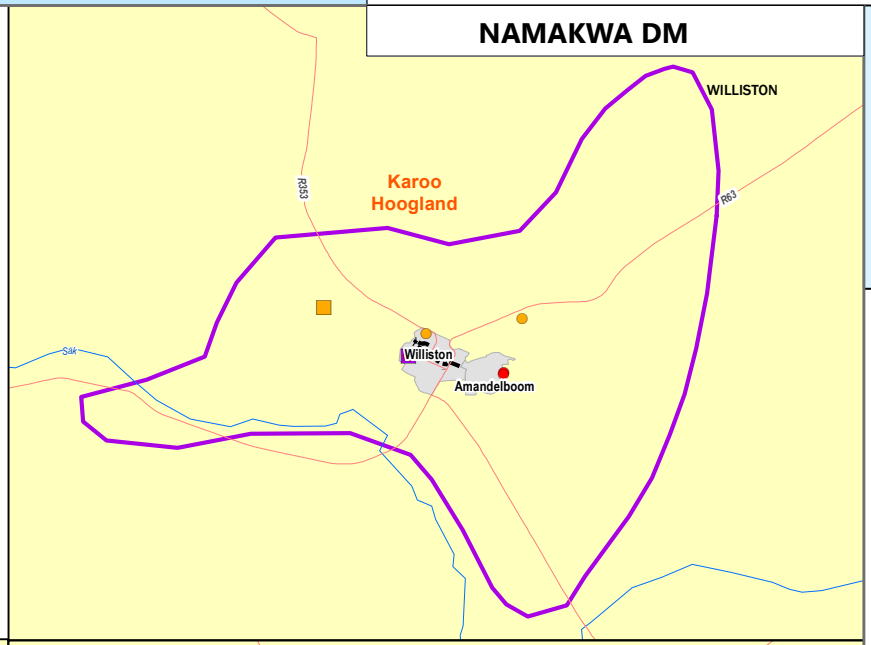
2. CURRENT SUPPLY STATUS

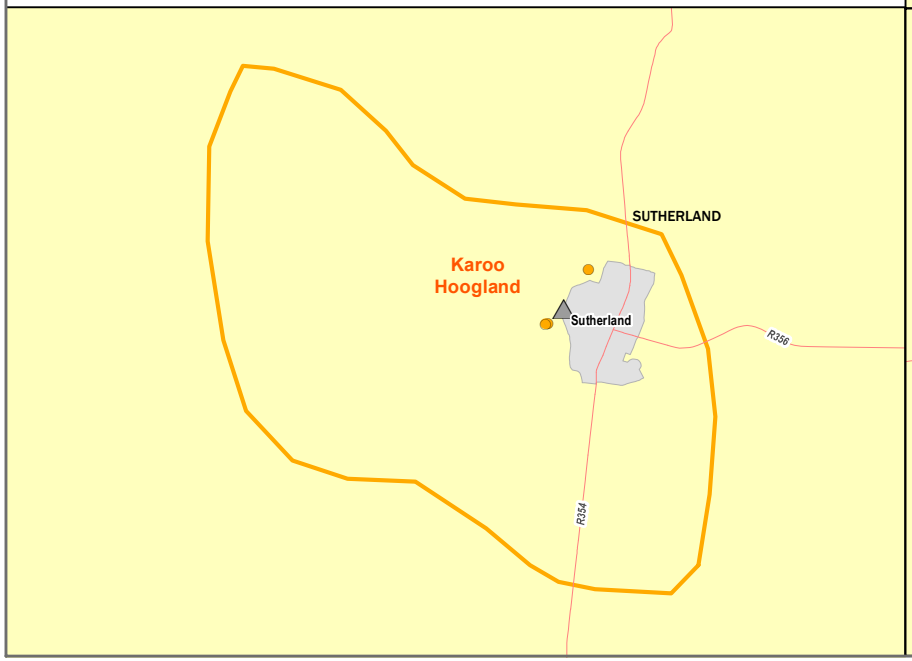
2.2 INFRASTRUCTURE

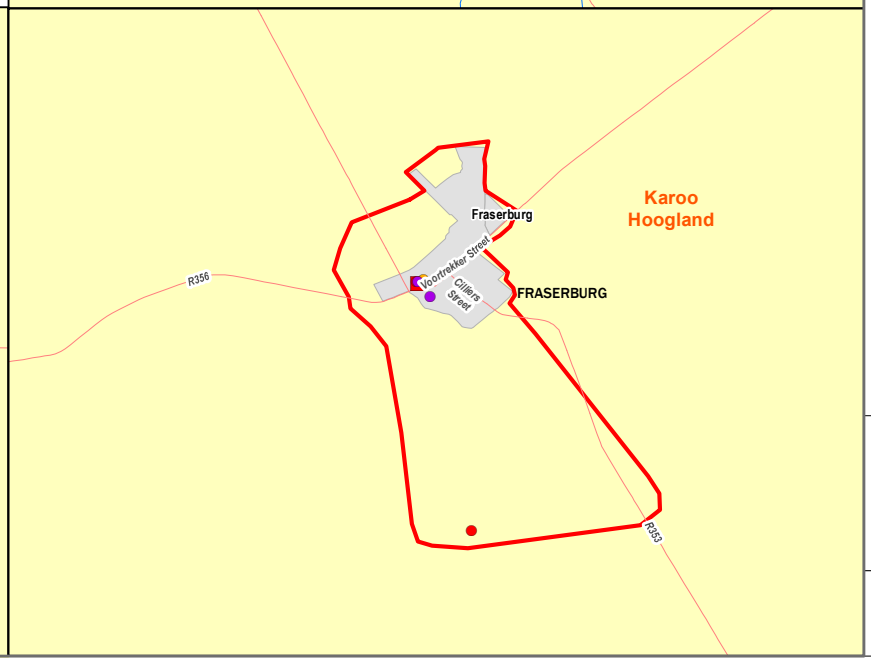
2.2.1 Water Scheme Infrastructure

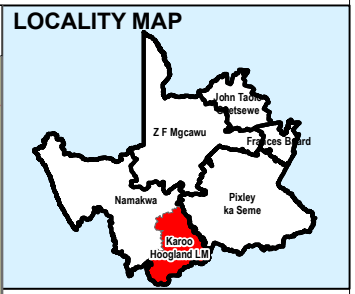
Water Infrastructure Refurbishment Needs











Water Infrastructure Refurbishment Needs

Water Bulk Pipelines

Water Scheme Areas (3)

- High - 1
- Medium - 1
- Low - 1
- None - 0

Reservoirs (14)

- High - 3
- Medium - 5
- Low - 6
- None - 0
- Unknown - 0

Water Pumpstations (4)

- High - 1
- Medium - 1
- Low - 2
- None - 0
- Unknown - 0

Water Treatment Works (1)

- High - 0
- Medium - 0
- Low - 0
- None - 0
- Unknown - 1

BASE MAP LEGEND

- Karoo Hoogland LM
- Provincial Boundaries
- District Municipal Boundaries
- Local Municipal Boundaries
- Settlements

Water Scheme Area Life Span Reached

** Scheme Area Title Block colour refer to Life Span Reached Status*

NO	YES	UNKNOWN

FRASERBURG

Infrastructure Component	No of Components	O&M Performed				General Physical Condition				Total Expected Lifespan			Lifespan Reached			Total Cost Requirements (RM)	
		Regular	Periodic	Sporadic	None	Prime Condition	Operational	Dysfunctional	Vandalised	Short Term (1 - 3yr)	Medium Term 3 - 10yr)	Long Term 10 - 20yr)	Yes	No	Unknown	Total Refurbishment Cost	Total Replacement Cost
Bulk Pipelines (km)	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R -	R -
Reservoirs	5	-	-	5	-	-	4	1	-	1	1	3	1	4	-	R 1,52	R 2,20
Pumpstations	1	-	-	1	-	-	1	-	-	-	-	1	-	1	-	R 2,18	R 3,64
Water Treatment Works	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R -	R -
Boreholes	9	-	-	9	-	-	9	-	-	2	1	6	2	7	-	R 4,38	R 4,01

SUTHERLAND

Infrastructure Component	No of Components	O&M Performed				General Physical Condition				Total Expected Lifespan			Lifespan Reached			Total Cost Requirements (RM)	
		Regular	Periodic	Sporadic	None	Prime Condition	Operational	Dysfunctional	Vandalised	Short Term (1 - 3yr)	Medium Term 3 - 10yr)	Long Term 10 - 20yr)	Yes	No	Unknown	Total Refurbishment Cost	Total Replacement Cost
Bulk Pipelines (km)	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R -	R -
Reservoirs	3	-	-	3	-	-	3	-	-	-	-	3	-	3	-	R 0,16	R 0,40
Pumpstations	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R -	R -
Water Treatment Works	1	-	-	1	-	-	1	-	-	-	-	-	-	1	1	R -	R 3,19
Boreholes	7	-	-	7	-	-	7	-	-	2	-	5	2	5	-	R 3,52	R 3,27

WILLISTON

Infrastructure Component	No of Components	O&M Performed				General Physical Condition				Total Expected Lifespan			Lifespan Reached			Total Cost Requirements (RM)	
		Regular	Periodic	Sporadic	None	Prime Condition	Operational	Dysfunctional	Vandalised	Short Term (1 - 3yr)	Medium Term 3 - 10yr)	Long Term 10 - 20yr)	Yes	No	Unknown	Total Refurbishment Cost	Total Replacement Cost
Bulk Pipelines (km)	1,51	-	-	2	-	-	-	-	-	-	-	2	-	2	-	R 0,04	R 0,40
Reservoirs	5	-	-	5	-	-	5	-	-	-	-	5	-	5	-	R 2,92	R 6,71
Pumpstations	2	-	-	2	-	-	1	1	-	-	1	1	-	2	-	R 6,28	R 10,46
Water Treatment Works	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R -	R -
Boreholes	20	-	-	20	-	2	18	-	-	9	-	11	9	11	-	R 12,59	R 16,44

Source: Sutherland Strategy

Source: Williston Strategy

Source: Fraserburg Strategy

Summary Description

2.2.2.1 Blue drop status

Municipal BDRR Score: 31,6%

All three drinking water supply systems under Karoo Hoogland LM achieved low Blue Drop Risk Ratings.

A: Design Capacity and B: Operational Capacity

Design and operational capacity information was provided for all systems. However, Sutherland and Williston systems are operating at 100% of design capacity indicating insufficient treatment capacity to supply current and future requirements.

C: Water Quality Compliance

Criteria C reports on the actual water quality in the supply systems. Sutherland supply system achieved excellent microbiological and chemical compliance. However, inadequate alignment of monitoring programmes to SANS 241:2015 requirements reduces the Regulators confidence in the quality of water supplied. Although Fraserburg and Williston supply systems achieved excellent microbiological compliance, unacceptable chemical compliance and inadequate alignment of monitoring programmes to SANS 241:2015 requirements means that the water supplied may still present health risks to the consumers.

D: Technical Skills

Under criteria D, all supply systems achieved poor scores and this indicates inadequate alignment of supervisors, process controllers and maintenance teams to the regulations requirements. Inadequate alignment of staff to the regulations requirements may impact on operation and maintenance practices which may ultimately impact on supply of drinking water to consumers.

E: Water Safety Plans

With regards to criteria E, SANS 241:2015 and WHO aligned Water Safety Plans including full SANS analysis, risk-based monitoring and implementation of measure to reduce risks has not been adopted at all supply systems and this impacted on scores under this criterion.

The blue drop report lists no supply systems as **critical risk or** as **high risk**

2.2.2.2 Water Schemes

2.2.2.2.1 Williston

Williston is totally dependent on groundwater abstracted from three production boreholes northeast of the town. All the boreholes are equipped with electrical submersible pumps which is directly pumped into the main reservoirs where the water is disinfected and then distributed via gravitation to the town

The three boreholes are pumped via a 110mm diameter uPVC pipeline to Nuwe reservoir (1.5 Ml), with one borehole being pumped via 100mm diameter asbestos pipeline to the Western Reservoir (1 Ml) and gravitates with 100mm diameter asbestos cement pipeline to a small area of town called Amandelboom reservoir (250 kl).

Water Pump stations

There are 2 water pump stations in the Williston water scheme area

1 Pump station is dysfunctional and needs to be assessed to determine if refurbishment or replacement is required

Water treatment works

There is no WTW in the Williston scheme area. Water is disinfected at the reservoirs before distribution into the town

Reservoirs

There are 5 operational reservoirs in the Williston water scheme area

Three of the reservoirs are being used to distribute water into Williston. The details of the reservoirs are given below

Nuwe reservoir 1,5 Ml

Western reservoir 1 Ml

Amandelboom reservoir 250 kl

The 2 remaining reservoirs are not in use

Boreholes

There are a total of 20 boreholes in the Williston water supply area

Only 3 boreholes are utilised as production boreholes
9 Boreholes have reached the end of their lifespan, however these are not production boreholes and no further action is required

Lifespan Reached
9 Boreholes have reached the end of their lifespan, however these are not production boreholes and no further action is required

Refurbishment and Replacement needs
1 Pump station is dysfunctional and needs to be assessed to determine if refurbishment or replacement is required

2.2.2.2.2 Sutherland

Sutherland's supply system main source of water is from groundwater, which is abstracted from three production boreholes surrounding town. The boreholes are pumped directly into a newly constructed WTW where it is treated. From the WTW water is pumped to three municipal reservoirs and then gravitates to town via 200mm diameter HDPE pipelines.

Water Pump stations
There are no water pump stations in the Sutherland water scheme area

Water treatment works
The newly constructed Water treatment works in Sutherland has a capacity of 0,5 Ml/day

Reservoirs
There are 3 operational reservoirs in the Sutherland water scheme area

Boreholes
There are 7 boreholes in the Sutherland water scheme area
Only 3 boreholes are utilised as production boreholes
2 Boreholes have reached the end of their lifespan, however these are not production boreholes and no further action is required

Lifespan Reached
2 Boreholes have reached the end of their lifespan, however these are not production boreholes and no further action is required

Refurbishment and Replacement needs
Sutherland is experiencing some problems with their bulk water supply, however this is being addressed by a WSIG project at present

2.2.2.2.3 Fraserburg

No surface water is utilized in the Fraserburg area. Boreholes are utilized to provide water to the community. Boreholes are equipped with pumps and pipelines, connected to high elevated concrete reservoirs. From the reservoirs water is gravity fed into the reticulation system

Water Pump stations
There is 1 operational water pump station in the Fraserburg water scheme area (Fraserburg new booster pump station)

Water treatment works
There is no WTW in the Fraserburg scheme area. Water is disinfected at the reservoirs before distribution into the town

Reservoirs
There are 4 operational reservoirs, and 1 dysfunctional reservoir in the Fraserburg water scheme area
The dysfunctional reservoir have also reached the end of it's lifespan and should be assessed to determine if refurbishment or replacement is required

Boreholes
There are 9 operational boreholes in the Fraserburg water supply scheme area
Only 5 boreholes are utilised as production boreholes
2 Boreholes have reached the end of their lifespan and should be assessed to determine if refurbishment or replacement is required

Lifespan Reached
The dysfunctional reservoir have also reached the end of it's lifespan and should be assessed to determine if refurbishment or replacement is required

Refurbishment and Replacement needs
The dysfunctional reservoir have also reached the end of it's lifespan and should be assessed to determine if refurbishment or replacement is required
2 Boreholes have reached the end of their lifespan and should be assessed to determine if refurbishment or replacement is required
Telemetry installations are required at all the components in the scheme

2.2.2.3 Operation and Maintenance

Repair and maintenance of the water distribution network take place mainly on a reactive basis, based on customer requests and emergency repair work as and when required. A pipe replacement strategy should be implemented

Actual operation and maintenance expenditure figures are not available and a comparison between actual and budgeted expenditure cannot be made to determine the effectiveness of operation and maintenance. National Treasury recommends that municipalities budget for maintenance and repair for an annual sum equivalent to 8% of the "carrying value" of "property, plants and equipment and investment property" (PPE)

The replacement costs for the water and sanitation infrastructure were assessed according to the life span of the infrastructure and the unit cost of the infrastructure according to the industry rates. This total estimated replacement cost was then used to determining the 8% per annum O&M cost requirement

The total O&M requirement is tabled below: **R 2,16 million**

Infrastructure Component		No of Components	Length (Km) Capacity (Ml / kl)	O&M need	
				Total Annual Operational Cost requirement (R mill)	Total Annual Maintenance Cost requirement (R mill)
Water	Bulk Pipelines	5	1,51	R 0,02	R 0
	Reservoirs	14	4 207,26	R 0,37	R 0,37
	Pump Stations	3	0,00	R 0,56	R 0,56
	WTW	1	0,50	R 0,13	R 0,13
	Total			R 1,08	R 1,08

2.2.2.9 Refurbishment and Replacement Needs

Ageing infrastructure - AC pipes require replacement

The refurbishment costs for the water and sanitation infrastructure were assessed according to the refurbishment need of the infrastructure and the unit cost of the infrastructure according to the industry rates.

The total refurbishment cost requirement is tabled below: **R 13,10 million**

Infrastructure Component		No of Components	Length (Km) Capacity (Ml / kl)	Refurbishment Need	
				Total Refurbishment Need %	Total Refurbishment Cost (R mill)
Water	Bulk Pipelines	5	1,51	0,00	R 0
	Reservoirs	14	4 207,26	55,71	R 4,60
	Pump Stations	3	0,00	60,00	R 8,46
	WTW	1	0,50	0,00	R -
	Total				R 13,10

The replacement costs for the water and sanitation infrastructure were assessed according to the life span of the infrastructure and the unit cost of the infrastructure

The total refurbishment cost requirement is tabled below: **R 17,28 million**

Infrastructure Component		No of Components	Length (Km) Capacity (Ml / kl)	Replacement Need	
				Total Replacement Need(%)	Total Replacement Cost (R mill)
Water	Bulk Pipelines	5	1,51	20,00	R 0
	Reservoirs	14	4 207,26	28,57	R 9,31
	Pump Stations	3	0,00	30,00	R 4,39
	WTW	1	0,50	0,45	R 3,19
	Total				R 17,28

DWS NT COGTA BD Intervention:

n/a

The following actions should be implemented:

Planning and budgeting to addresses capacity exceedance at Sutherland and Williston supply systems which are operating above 90% of design

Implement corrective measures in the event of chemical and micro biological failures

Appointment of suitably qualified staff and/or training of existing staff (supervisors, process controllers and maintenance teams) to ensure adequate alignment to set criteria.

Development and implementation of Water Safety Plans as per SANS 241:2015 and WHO guidelines including risk assessment of entire supply system, development of risk-based monitoring programmes and implementation of mitigating measures to address all medium and high risks.

Alignment of microbiological and chemical water quality monitoring programmes to SANS 241:2015 requirements in terms of frequency, coverage and number of samples.

Williston

1 Pump station is dysfunctional and needs to be assessed to determine if refurbishment or replacement is required

Sutherland

Sutherland is experiencing some problems with their bulk water supply, however this is being addressed by a WSIG project at present

Fraserburg

The dysfunctional reservoir have also reached the end of it's lifespan and should be assessed to determine if refurbishment or replacement is required

2 Boreholes have reached the end of their lifespan and should be assessed to determine if refurbishment or replacement is required

Telemetry installations are required at all the components in the scheme

Summary Desciption

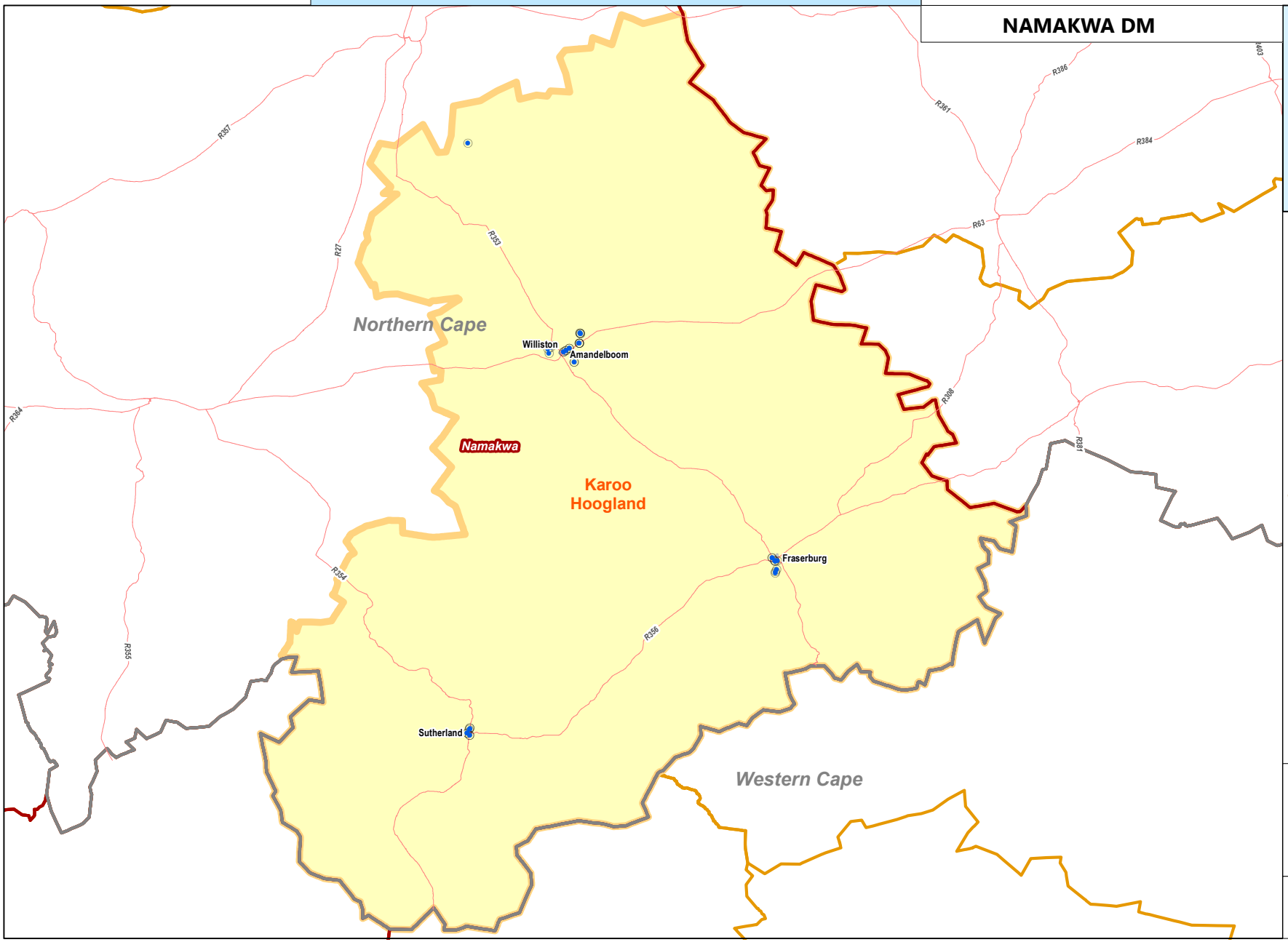
SETTLEMENTS WITH BOREHOLE SUPPLY
List per Local Municipality: Karoo Hoogland LM

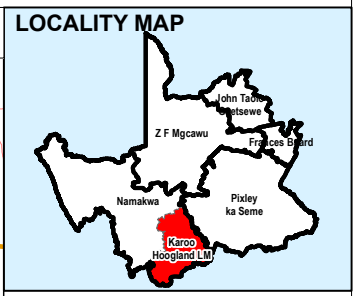
All the settlements in the WSA rely on groundwater as only water resource. The individual settlements are listed below:

Karoo Hoogland LM	
FRASERBURG	9
SUTHERLAND	7
WILLISTON	20
Total Boreholes	**36**

2.2.4 Groundwater Infrastructure

Groundwater Infrastructure General Physical Condition and Monitoring





Boreholes

General Physical Condition

- Prime Condition/Operational - 36
- Not Operational/Dysfunctional/ Vandalized - 0
- Unknown Condition - 0

Field Abstraction Recorded

- Yes - 0
- No - 0
- Unknown - 36

Settlement Water Supply

- Single Type Settlements supplied by Boreholes Only
- Settlements within a Scheme Area supplied by Boreholes Only

BASE MAP LEGEND

- Karoo Hoogland LM
- Provincial Boundaries
- District Municipal Boundaries
- Local Municipal Boundaries
- Settlements

Summary Description

Karoo Hoogland LM

Source: Sutherland Strategy

Source: Williston Strategy

Source: Fraserburg Strategy

2.2.4.1 Dependency on Groundwater

Williston

Williston is totally dependent on groundwater abstracted from three production boreholes northeast of the town. All the boreholes are equipped with electrical submersible pumps which is directly pumped into the main reservoirs where the water is disinfected and then distributed via gravitation to the town.

Sutherland

Sutherland's supply system main source of water is from groundwater, which is abstracted from three production boreholes surrounding town. The boreholes are pumped directly into a newly constructed WTW where it is treated. From the WTW water is pumped to three municipal reservoirs and then gravitates to town via 200mm diameter HDPE pipelines.

Fraserburg

No surface water is utilized in the Fraserburg area. Boreholes are utilized to provide water to the community. Boreholes are equipped with pumps and pipelines, connected to high elevated concrete reservoirs. From the reservoirs water is gravity fed into the reticulation system.

2.2.4.2 General Physical Condition of Boreholes

There are no dysfunctional boreholes at any of the 3 schemes, however not all boreholes are used as production boreholes

In Williston, only 3 of the 20 boreholes are used as production boreholes

In Sutherland, only 3 of the 7 boreholes are used as production boreholes

In Fraserburg, only 5 of the 9 boreholes are used as production boreholes

2.2.4.3 Abstraction Infrastructure

All the production boreholes are equipped with submersible pumps for all the schemes

2.2.4.4 Groundwater Management (Abstraction volumes, available yields, monitoring, etc.)

All Schemes

Water quality monitoring is taking place in all probability after treatment and disinfection

It is uncertain how often abstraction volumes and water levels are monitored