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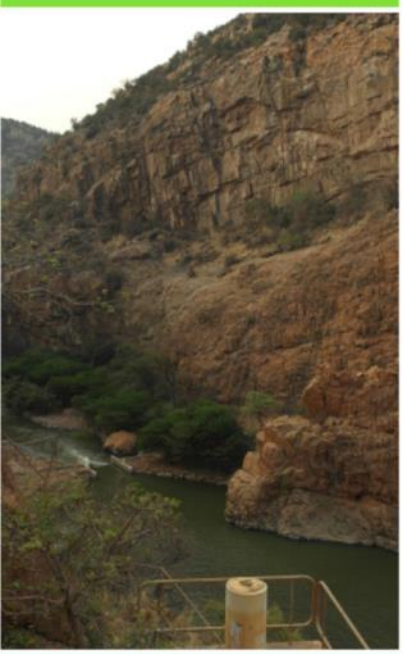

THE DEVELOPMENT OF THE LIMPOPO WATER MANAGEMENT AREA NORTH RECONCILIATION STRATEGY

WATER REQUIREMENTS AND RETURN FLOWS

Supporting Document 3:
Socio-Economic Perspective on Water Requirements

FINAL

FEBRUARY 2016

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Report Title:	***Socio-Economic Perspective on Future Water Requirements***
Author:	***G Steyn***
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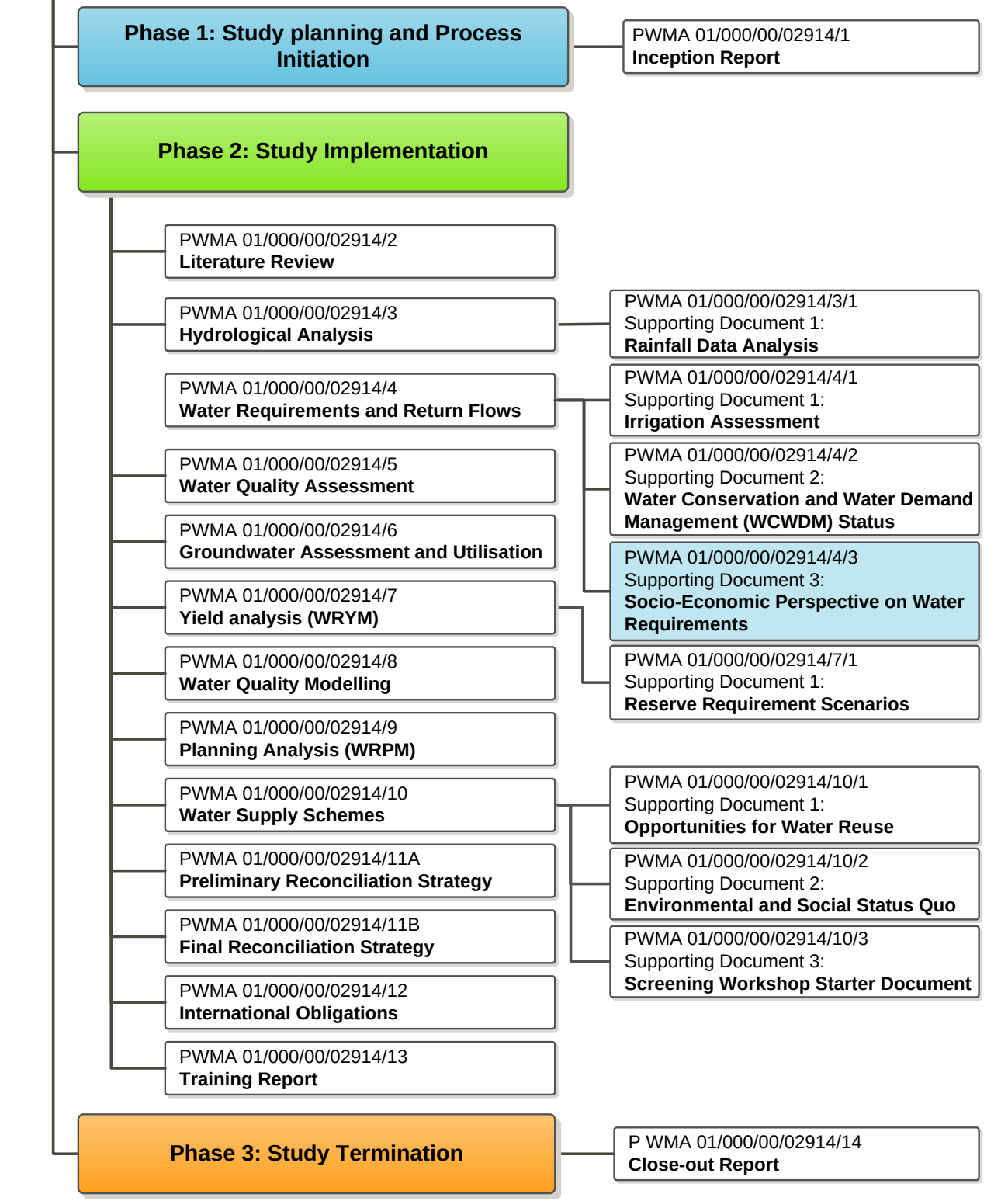
VSA Rebotile Metsi

Limpopo Water Management Area North Reconciliation Strategy

Date: February 2016



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LIST OF UNITS

a	annum
ha	hectare
kℓ	kilolitre
km	kilometer
km^2	square kilometre
ℓ/c/d	liter per capita per day
ℓ/s	litre per second
m	metre
m^3	cubic meter
m^3/a	cubic meter per annum
Mℓ/d	megalitre per day
mm	millimetre
m^3/ha/a	cubic meter per hectare per annum

LIST OF ABBREVIATIONS AND ACRONYMS

AECOM	AECOM SA (Pty) Ltd
CoAL	Coal of Africa Limited
DGP	District Growth Point
DM	District Municipality
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
LEIP	Limpopo Eco-Industrial Park
LM	Local Municipality
LSP	Local service points
MCWAP	Mokolo-Crocodile Water Augmentation Project
MGP	Municipal Growth Point
ORWRDP	Olifants River Water Resources Development Project
PCP	Population concentration points
PGP	Provincial Growth Point
RDP	Reconstruction and Development Programme
SEZ	Special Economic Zone
Stats SA	Statistics South Africa
WCWDM	Water Conservation and Water Demand Management
WMA	Water Management Area
WRPM	Water Resources Planning Model
WRSM2000	Water Resources Simulation Model 2000
WRYM	Water Resources Yield Model
WSA	Water Service Authority

1 INTRODUCTION

1.1 APPOINTMENT OF PROFESSIONAL SERVICE PROVIDER (PSP)

The Department of Water and Sanitation (DWS), then Department of Water Affairs (DWA) appointed **AECOM SA (Pty) Ltd** in association with three sub-consultants **Hydrosol**, **Jones and Wagener** and **VSA Rebotile Metsi Consulting** with effect from 1 March 2014 to undertake the **Limpopo Water Management Area North Reconciliation Strategy**.

1.2 BACKGROUND TO THE PROJECT

The DWS (then DWA) identified a need for the development of the Limpopo Water Management Area (WMA) North Reconciliation Strategy. The Limpopo WMA North refers to the Limpopo WMA described in the first edition of the *National Water Resource Strategy* (NWRS-1) published in 2004. The 19 initial WMAs were consolidated into nine WMAs during 2012 and acknowledged in the second edition of the *National Water Resource Strategy* (NWRS-2) of 2013. The newly defined Limpopo WMA also includes the original Crocodile (West) and Marico WMA as well as the Luvuvhu River catchment, previously part of the Luvuvhu and Letaba WMA. However, these additional areas will not be part of this Reconciliation Strategy.

The Limpopo WMA North comprises of six main river catchments; Matlabas, Mokolo, Lephalala, Mogalakwena, Sand and Nzhelele and are shown in **Figure 1.1**. The very small Nwanedi River catchment forms part of the Nzhelele River catchment. Most of these river catchments rely on their own water resources and are managed independently from neighbouring catchments. This implies that some river catchments require separate and independent reconciliation strategies whilst others need integrated water management reconciliation strategies.

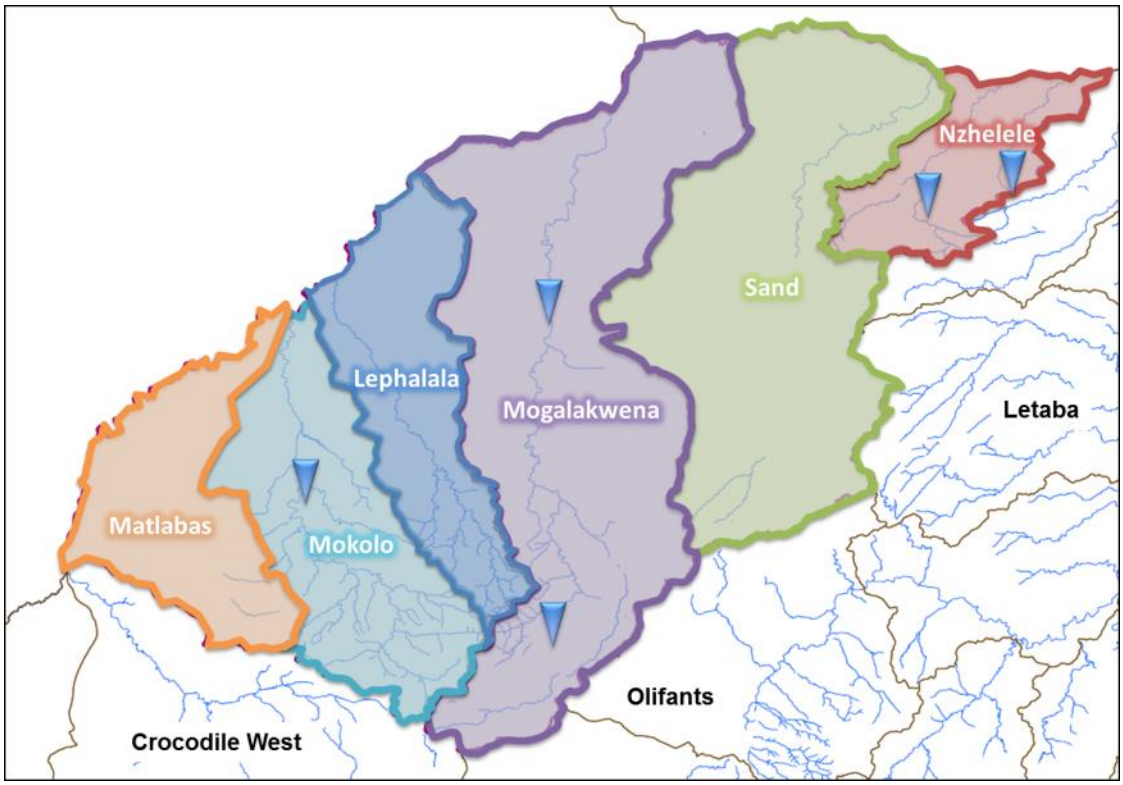


Figure 1.1: Overview of the catchments of the Limpopo WMA North

The main urban areas within the WMA include Mokopane, Polokwane, Mookgophong, Modimolle, Lephalale, Musina and Louis Trichardt. Approximately 760 rural communities are scattered throughout the WMA, mostly concentrated in the central region. The main economic activities are irrigation and livestock farming as well as expanding mining operations due to the vast untapped mineral resources in the area. The water resources, especially surface water resources, are heavily stressed due to the present levels of development. It is crucial that water supply is secured and well managed.

The most western area of the Limpopo WMA North, the Matlabas River catchment, is a dry catchment with no significant dams and with a low growth potential for land-use development.

The large Mokolo Dam, in the Mokolo River catchment, supplies water to the Matimba Power Station, Medupi Power Station, Grootegeluk Coal Mine, the Lephalale Local Municipality (LM) as well as a number of downstream irrigators. The dam is able to meet the bulk of the current requirements but will in future rely on transfers from other WMAs to meet the water requirements at a sufficiently high assurance of supply.

The middle reaches of the Lephalala River catchment have a high conservation value with irrigation activities dominant in the remainder of the catchment. Irrigation in this area is supplied by surface water and alluvial aquifer abstraction.

The bulk of the water resources in the Mogalakwena River catchment have been fully developed. The Doorndraai Dam is over-allocated. Additional water to support the rapid expanding mining activities in the vicinity of Mokopane needs to

be augmented by transfers from the Flag Boshielo Dam in the adjacent Olifants River catchment. Glen Alphine Dam presently supplies water to emerging farmers, who has not yet taken up their full allocated quota, and is expected to supply the growing domestic requirements in future.

Groundwater resources in the Mogalakwena and the Sand river catchments have been extensively utilised, and possibly over-exploited by the dominating irrigation sector. The expanding urban and industrial requirements of Polokwane and Makhado LMs, currently supplied by Albasini Dam, rely heavily on water transfers from adjacent WMAs. This includes transfers from the Ebenezer Dam, Dap Naude Dam, Flag Boshielo Dam and Nandoni Dam in the Olifants WMA.

Domestic and irrigation water in the small but highly developed Nzhelele River catchment is supplied through the Mutshedzi Dam Regional Water Supply Scheme and the Nzhelele Dam Regional Water Supply Scheme as well as extensively from groundwater resources. The inflows to the Mutshedzi and Nzhelele dams have been reduced as a result of afforestation upstream of these dams. The area is in deficit due to the over-allocation and over development of irrigation.

The Sand and Nzhelele river catchments have high coal mining potential but the availability of local water resources may limit future mining development.

1.3 STUDY AREA

The Limpopo WMA North is the most northern WMA in South Africa and refers to the area described as the Limpopo WMA in NWRS-1. Refer to **Figure 1.2** for the location and general layout of the study area. The areas indicated in grey show the additional catchment and WMA areas included in the Limpopo WMA as per NWRS-2 and which do not form part of the study area for this reconciliation strategy.

The Limpopo WMA North forms part of the internationally shared Limpopo River Basin which also includes sections of Botswana, Zimbabwe and Mozambique. The Limpopo River forms the entire length of the northern international border between South Africa and Botswana and Zimbabwe before flowing into Mozambique and ultimately draining into the Indian Ocean. The dry Limpopo WMA North is augmented with transfers from the adjacent Letaba, Olifants and Crocodile West river catchments. No transfers are currently made from the Limpopo WMA North to other WMAs.

The main rivers in the study area, which form the six major catchment areas, are the Matlabas, Mokolo, Lephalala, Mogalakwena, Sand and Nzhelele rivers. These rivers, together with other smaller tributaries, flow northwards and discharge into the Limpopo River.

The climate over the study area is temperate and semi-arid in the south to extremely arid in the north. Mean annual rainfall ranges from 300 mm to 700 mm with the potential evaporation well in excess of the rainfall. Rainfall is seasonal

with most rainfall occurring in the summer with thunderstorms. Runoff is low due to the prevalence of sandy soils in the most of the study area, however, loam and clay soils are also found.

The topography is generally flat to rolling, with the Waterberg on the south and the Soutpansberg in the north-east as the main topographic features. Grassland and sparse bushveld shrubbery and trees cover most of the terrain.

The southern and western parts of the WMA are mainly underlain by sedimentary rocks, whilst metamorphic and igneous rocks are found in the northern and eastern parts. With the exception of some alluvium deposits and dolomites near Mokopane and Thabazimbi, these formations are mostly not of high water bearing capacity. The mineral rich Bushveld Igneous Complex extends across the south-eastern part of the WMA, and precious metals are mined at various localities throughout the area. Large coal deposits are found in the north-west.

Several wildlife and nature conservation areas have been proclaimed in the WMA, of which the Nylsvley Nature Reserve, Mapungubwe National Park and the Marekele National Park are probably the best known.

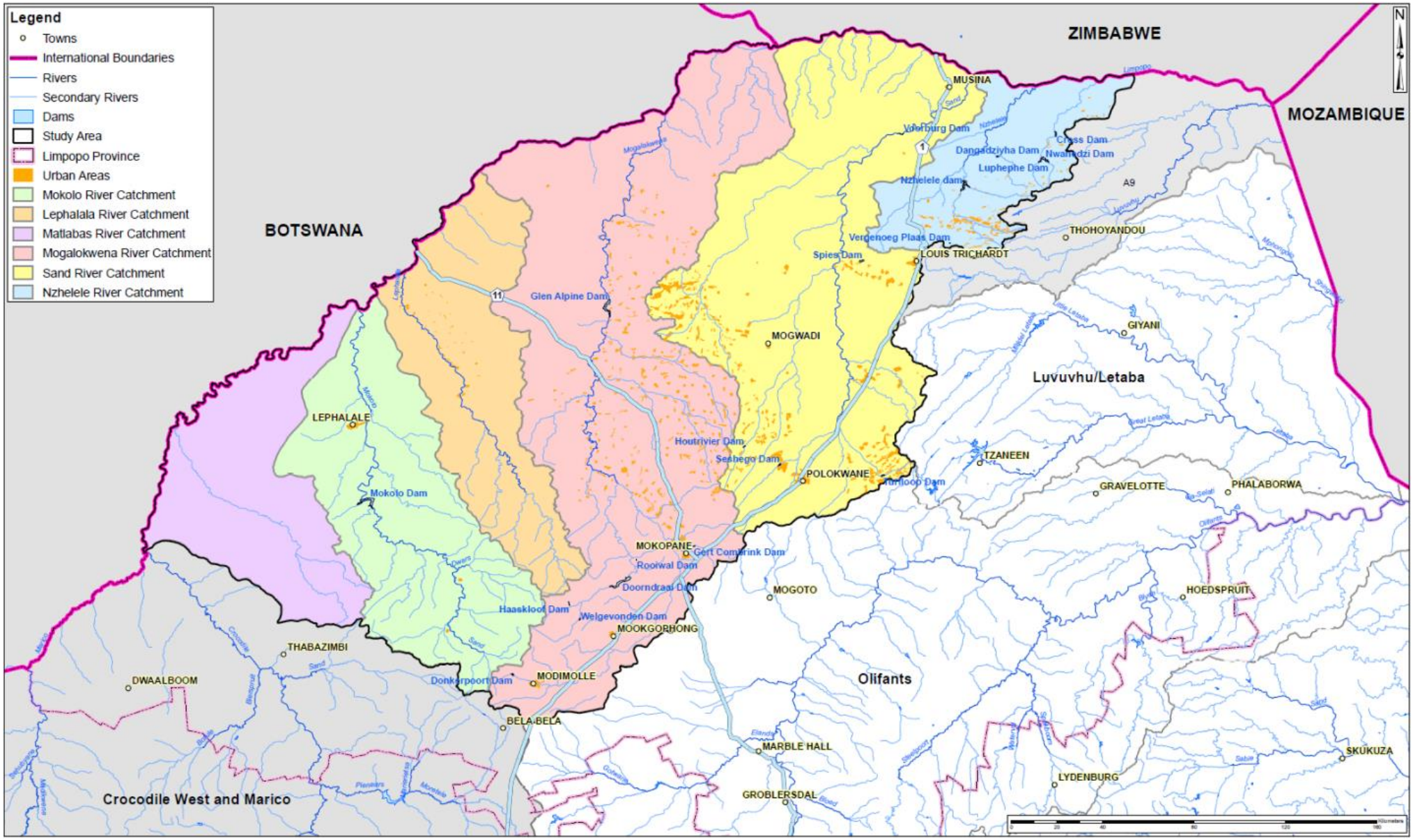


Figure 1.2: General layout of the Study Area

1.4 MAIN OBJECTIVES OF THE STUDY

The main objective of the study is to formulate a water resource reconciliation strategy for the entire Limpopo WMA North up to 2040. The reconciliation strategy must a) address growing water demands as well as water quality problems experienced in the catchment, b) identify resource development options and c) provide reconciliation interventions, structural and administrative/ regulatory. To achieve these objectives, the following aspects are included in the study:

- Review of all available information regarding current and future water requirements projections as well as options for reconciliation;
- Determine current and future water requirements and return flows and compile projection scenarios;
- Configure the system models (WRSM2000 rainfall-runoff catchment model, also known as the Pitman Model, the Water Resources Yield Model (WRYM) and the Water Resources Planning Model (WRPM)) in the study area at a quaternary catchment scale, or smaller, where required, in a manner that is suitable for allocable water quantification. This includes updating the hydrological data and accounting for groundwater surface water interaction;
- Assess the water resources and existing infrastructure and incorporate the potential for Water Conservation and Water Demand Management (WCWDM) and water reuse as reconciliation options; and
- Develop a preliminary short-term reconciliation strategy followed by a final long-term reconciliation strategy.

1.5 PURPOSE OF THIS REPORT

The purpose of this report is to estimate future residential and industrial water requirements in the Study Area.

Residential water requirements were estimated from a demographic and water service level analysis of settlement-level information from the national census of 2011. This information was aggregated and processed for the six different catchments that form part of the Study Area. Population estimates from the DWS for the Study Area were also used.

Industrial water requirements in the Study Area are primarily associated with the mining and manufacturing sectors. Projections of future industrial requirements are based on several planning reports that are listed as references. Retail, office and school water requirements are also included, but their magnitude is considerably smaller. Irrigation requirements are specifically excluded from this estimate because it comprises a separate study[1] within the Reconciliation Strategy.

[1] Schoeman and Partners are the project team members responsible for Irrigation Assessment

2 DEMOGRAPHICS

2.1 CURRENT SITUATION

Limpopo WMA North covers six catchments, three district municipalities (DMs) and 13 local municipalities (LMs). This area represents 186 wards and 713 settlements according to Statistics South Africa (Stats SA). The Study Area had a population of approximately 1.9 million people in 2011, based on Stats SA census information. This is summarised in Table 2.1.

Table 2.1 Summary of Limpopo WMA North demographics

Indicator	Number
Total population according to Stats SA Census 2011	1 897 664
Total population according to DWS Form G for 2011	1 941 592
River catchments	6
District Municipalities	3
Local Municipalities	13
Wards	186
Settlements according to Stats SA	713
Settlements according to DWS	881

Sources: Stats SA, Census 2011 and DWS LP Settlements Form G

The population estimate from DWS for 2011 (Form G) is 2.3% higher on the total figure, mostly because DWS was using a slightly higher household size than the census figures. The higher household number was from the 2006 Community Survey by Stats SA and resulted in a total population estimate from DWS for the Study Area of 1.942 million. The average size of households in the country and in Limpopo has shrunk between 2006 and 2011. DWS has subsequently adopted these lower household sizes in their population estimates for 2013.

The variation in population numbers between Stats SA and DWS is not significant at the project level. However, the variation is sharper at the catchment level as indicated in Table 2.2.

The variation in the Mokolo catchment is 23% in favour of Stats SA. The lower estimate by DWS could be due to systematic undercounts that result from their population estimation methodology[2] that was used in urban areas. Lephalale and Marapong towns have a heavy weighting in this catchment.

[2] Rooftop counts from satellite images that are multiplied by estimated household sizes. This methodology is reasonably accurate in rural areas, but problematic when multiple households live under one roof, which has a high incidence in urban areas where domestic assistants live on the same property as their employers

Table 2.2 Summary of Limpopo WMA North demographics at the catchment level

Catchment	DMs	LMs	No of wards	No of settlements		2011 population		% var
				DWS	SSA	DWS	SSA	
Lephalala	Capricorn & Waterberg	Blouberg Lephalale	7	39	17	62 776	52 802	19
Mokolo	Waterberg	Lephalale Modimolle	6	7	5	47 649	61 882	-23
Mogalakwena	Capricorn & Waterberg	Blouberg Aganang Mogalakwena Mookgopong Modimolle	71	310	268	655 836	547 349	20
Nzhelele	Vhembe	Musina Mutale Thulamela Makhado	18	162	135	213 290	258 027	-17
Sand	Vhembe & Capricorn	Musina Makhado Blouberg Molemole Aganang Polokwane	79	363	288	962 041	977 604	-2
Matlabas	Waterberg	Lephalale Thabazimbi Modimolle	5	0	0	0	0	0
Total	**3**	**13**	**186**	**881**	**713**	**1 941 592**	**1 897 664**	**2**

The converse applies in the Mogalakwena catchment, where the variance is 19.8% higher on the DWS estimate because of the weighting of rural settlements (with higher estimates of household sizes by DWS) in this part of the Study Area in 2011. These estimates of household size were subsequently adjusted by DWS to more appropriate levels.

The standard planning procedure to overcome these variances is to use Stats SA census figures as the primary source, because this institution is the official provider of demographic statistics in the country. DWS estimates should also be considered for planning purposes, because it provides a useful comparison to the census figures, especially in rural areas, and because it endeavours to provide for circular migration. These are people who visit a settlement regularly and then return to work elsewhere. They must be included in the planning of adequate water services.

These two datasets (Census 2011 and DWS settlement population figures) can be combined to create a planning population instrument. It is based on the number of households per settlement[3] from the DWS database, but on household sizes from the 2011 Census, which are more current than the figures used by DWS for 2011. It includes a 4%[4] upward adjustment to provide for circular migration. This approach was used by DWS in Limpopo from 2013 onwards reconcile demographic planning information at settlement level with Census 2011 results.

[3] Adjustments were made to household numbers in urban areas on DWS database to overcome undercounts
[4] Derived from the National Transport Master Plan for Limpopo Province (Natmap 2050 Phase 1)

Census information will be used in this report for the current situation of the demographic analysis, as well as for the analysis of water and sanitation services and household income levels. However, the planning population will be used for the projection of residential water requirements in order to avoid undercounting of households and in order to provide for circular migration.

The difference in settlement numbers according to the Census and DWS is not a major concern, because it relates to the delineation and naming of sub-areas, rather than to disputes about the existence of settlements. The planning population instrument is consistent with settlement names that are used by DWS.

It is evident from the 2011 Census information in **Table 2.2** that the Sand catchment alone accounts for more than 51% of the Study Area population and more than 40% of all the settlements. It also has the largest number of wards. Mogalakwena catchment is the second largest in terms of population and number of settlements, although its average settlement size is much smaller than for the Sand catchment. This is illustrated in **Figure 2.1** and **Figure 2.2**.

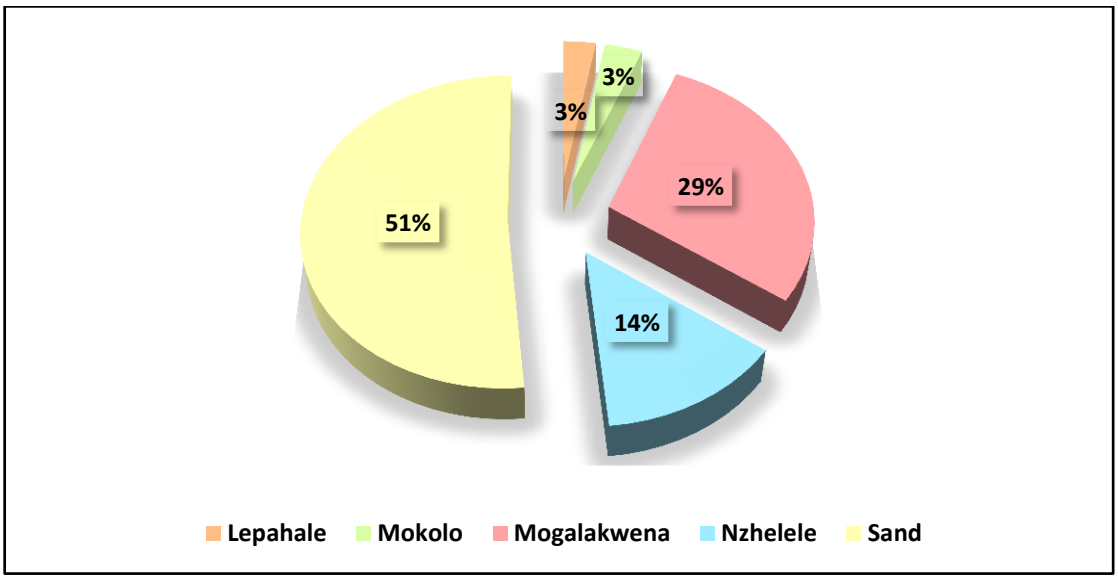


Figure 2.1 Population in the catchments

The Nzhelele catchment is intermediate in terms of size, but the Lephalala and Mokolo catchments are both relatively small.

The Matlabas catchment is not reflected because it has no settlements except for the small informal settlement of Steenbokpan, which was not recorded in the Census of 2011. Commercial farming is practiced in the entire catchment area and residents provide their own domestic water requirements from boreholes. Their water requirements for irrigation form part of a separate study as indicated above. Another study is currently underway to investigate the feasibility of formalising and upgrading the Steenbokpan Informal Settlement. The outcome of this study should form part of the Limpopo North Reconciliation Strategy, although the scale is likely to be small.

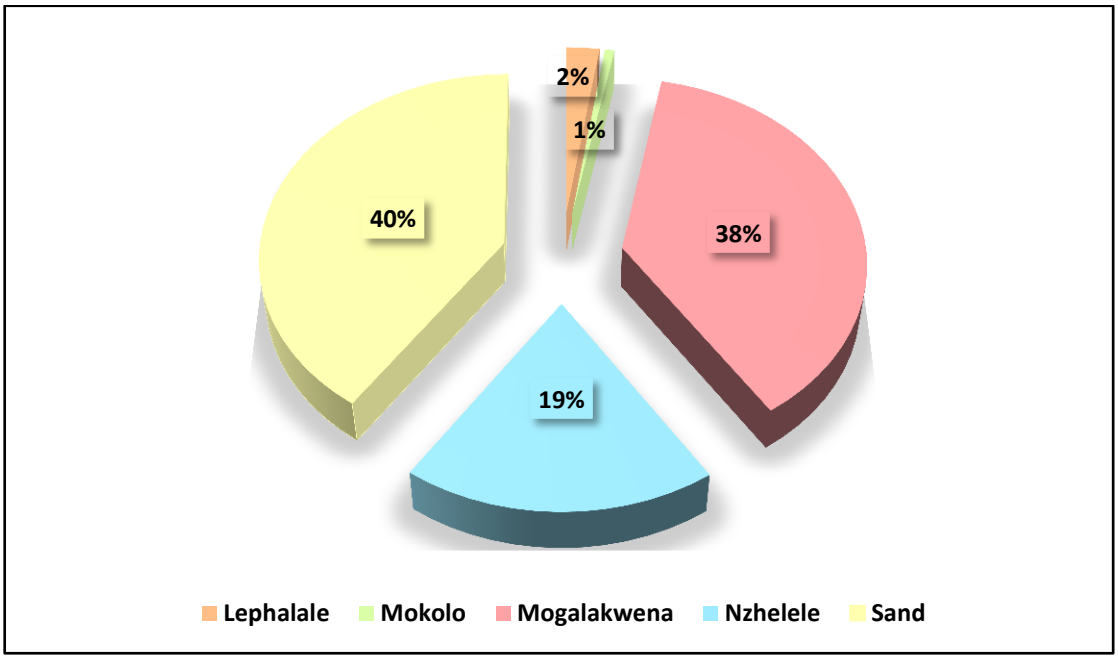


Figure 2.2 Number of settlements in the different catchments

The difference in the two distributions reflects the difference in the average settlement sizes among the five catchments. The average settlement size in the Sand catchment at 3 392 people is larger than the corresponding average in the Mogalakwena catchment at 2 050. Average settlement size for the entire Study Area is 2 663 persons. The Mokolo catchment has the largest settlement size of 12 376 people due to the weighting of Lephalale and Marapong towns.

The Study Area demographics can also be analysed according to district and local municipality configurations. Capricorn DM hosts almost 52% of the project population. Slightly more than 25% of the project population live in Waterberg DM and the remaining 23% live in Vhembe DM (see **Table 2.3** and **Figure 2.3**).

Table 2.3 Project area population per District and Local Municipality (2011)

District	Local Municipality	Census 2011 population	%
Waterberg	Lephalale	96 668	25.1
	Modimolle	59 998	
	Mogalakwena	294 244	
	Mookgophong	25 053	
Sub-total	**Waterberg DM**	**475 963**	
Capricorn	Blouberg	158 415	51.9
	Aganang	131 695	
	Molemole	96 631	
	Polokwane	597 887	
Sub-total	**Capricorn DM**	**984 628**	
Vhembe	Mutale	32 994	23.0
	Thulamela	29 951	
	Musina	79 121	
	Makhado	295 007	
Sub-total	**Vhembe DM**	**437 073**	
Total		**1 897 664**	**100.0**

Source: Stats SA, Census 2011

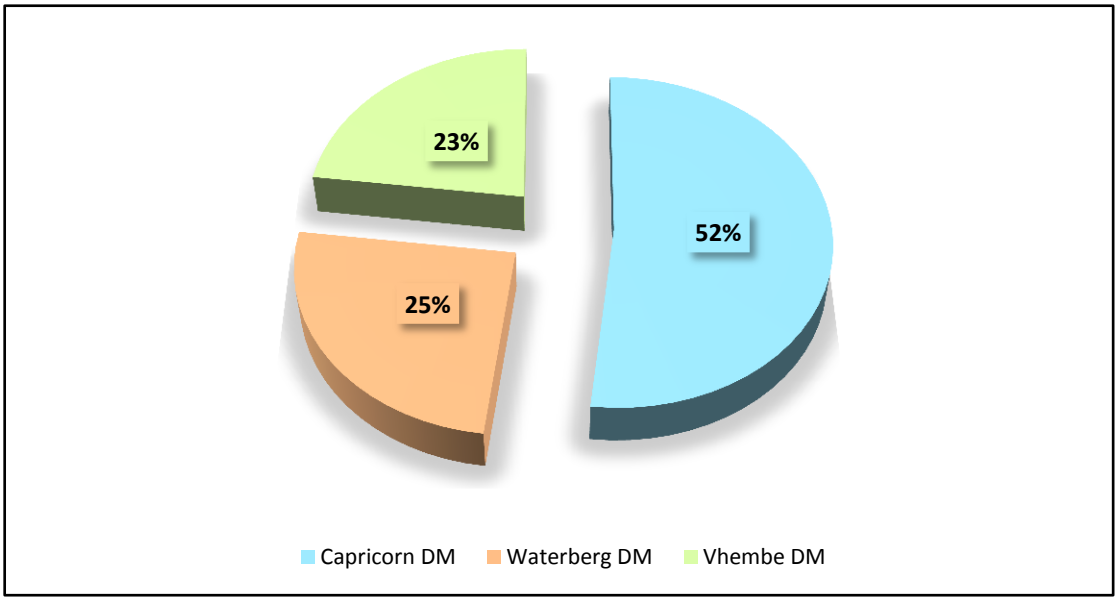


Figure 2.3 Project area population according to District Municipalities

Polokwane LM in the Capricorn DM is the largest single project host, with almost 600 000 people or 32% of the project population. Makhado and Mogalakwena LMs are also significant, with approximately 16% of the project population each. Mookgopong and Thulamela LMs contribute the smallest part of the project population, with less than 2% of the total each.

Another dimension for the analysis of Study Area demographics is to consider the urban-rural configuration. This can be done on the basis of the spatial classification of all settlements according to the Limpopo Spatial Rationale. For the purpose of this analysis the three different classes of growth points (provincial, district and municipal) are considered as urban and all the remaining settlements are classified as rural. It implies that squatter settlements will also be classified as urban if they are attached to a growth point. The urban-rural profile of the Study Area is reflected in **Table 2.4** and **Figure 2.4,** and the settlement classifications are indicated per catchment in the appendices.

Table 2.4 Urban-rural population profile per catchment (2011)

Catchment	Urban %	Rural %	Population
Lephalala	**7**	**93**	**65 658**
Mokolo	96	4	68 238
Mogalakwena	30	70	606 499
Nzhelele	27	73	200 027
Sand	39	61	1 025 167
Total	**710 827**	**1 254 761**	**19 655 885**
Total %	**36.2**	**63.8**	**100.0**

Source: Calculations by Glen Steyn & Associates from planning population and settlement classification in the Limpopo Spatial Rationale

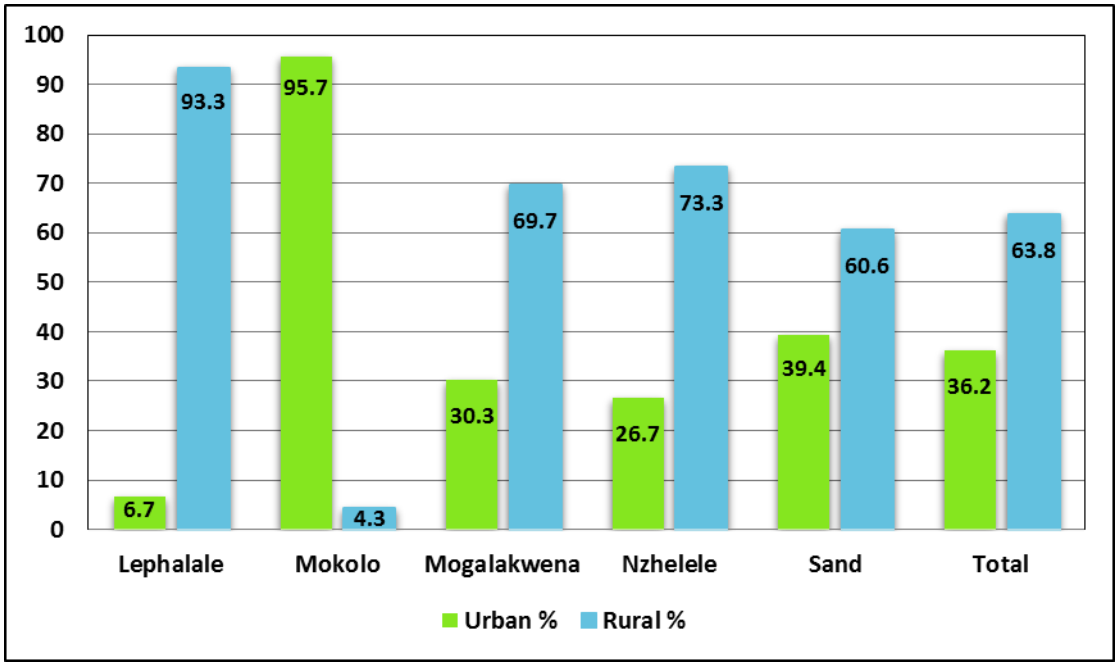


Figure 2.4 Urban rural profile of the Study Area

[5] This planning population differs from the DWS and Stats SA figures and is described in the section that follows

It is evident that the Study Area is predominantly rural with almost 64% of all residents living in settlements that fall in this classification. Mokolo catchment is the most urbanised, followed by the Sand catchment. Lephalala and Nzhelele catchments are the least urbanised.

This information provides a useful spatial context to planning for the upgrading of water and sanitation services. Unit costs of service delivery are generally lower in urban areas due to the higher settlement densities that are achieved. Population growth rates are also higher, because young families are migrating away from remote rural settlements towards urban places.

2.2 POPULATION GROWTH PROJECTIONS

The basis for the population projections that follow is the 2011 ***planning population***[6], which is derived from DWS settlement names and household numbers for 2011, but on Census household sizes. An upward adjustment of 4% was made to allow for circular migration. Census household numbers were used in towns, because these are considered to be more accurate than the DWS rooftop count. This approach is used in order to reduce the risk of undercounting households and to accommodate visitors in the water requirement projections. The 2011 planning population figure for the Study Area is ***1 965 588*** as indicated in **Table 2.5** (compared to the original DWS estimate of 1 941 592). Summaries of planning population numbers and growth projections per settlement for the different catchments for the period 2011-2040 are contained the appendices. Full details are provided in the accompanying spreadsheet.

A comparison of population numbers per settlement between Census 2001 and Census 2011 reflects a pattern of differential growth according to the position of a settlement on the Provincial hierarchy[7] of spatial development. These differential growth patterns differ across local municipalities. They provide a useful mechanism to use actual population growth rates from one census to another (2001-2011) to project future population growth for settlements on the database of DWS.

Economic growth points are at the top end of the hierarchy and they tend to grow faster than other settlements, especially when there is infrastructure and project investment in the growth point, such as in Lephalale town. These growth rates often exceed the natural rate and are driven mainly by migration inflows. Their classification in the Spatial Rationale is 'first order' and they include provincial (PGP), district (DGP) and municipal growth points (MGPs).

Small, remote settlements are at the other end of the hierarchy. They have no economic base and the lowest population growth rates, which are negative in some cases due to outmigration of young adults. Their settlement classification is fourth or fifth order, depending on their location relative to other settlements.

[6] This instrument was also used to calculate the level of urbanisation referred to in the section above
[7] Limpopo Spatial Rationale, 2006

Fourth order indicates some interaction with other settlements in the vicinity, whereas fifth order applies to settlements that are isolated.

Population concentration points (PCP) are classified as 'second order' on the settlement hierarchy. They refer to large, rural settlements or clusters of several smaller settlements that do not have an economic base. Residents commute to growth points or to other places nearby for work.

Local service points (LSP) are classified as 'third order' within the spatial hierarchy. They are located at road intersections between small, rural settlements and provide a limited, local retail and service function. Population growth rates for second and third order settlements are slightly positive to flat, unless they are located in close proximity to economic growth points. In this case their population growth rates are higher.

The Limpopo Spatial Rationale, 2006, provides a detailed description and classification of all settlements according to various positions within the spatial hierarchy. These classifications per settlement are reflected in the appendices and on the spreadsheets containing detailed planning information per catchment that accompanies this report.

The population growth projections that are used in this report from 2012 to 2040 are based on the actual averages per settlement classification per LM between 2001 and 2011, as well as on anticipated large project investments that will attract migration towards new jobs. Natural population growth rates are in long-term decline, but significant migratory shifts are occurring, away from remote rural areas towards urban areas and especially towards economic growth points. These shifts are reflected in the population projections at the settlement level and are summarised at the catchment level in **Table 2.5**.

Table 2.5 Summary of projected population growth rates per catchment

Catchment	Planning population 2011	Average annual population grow rate 2011-2020 %	Average annual population grow rate 2021-2030 %	Average annual population grow rate 2031-2040 %
Lephalala	**65 658**	0.46	0.49	0.49
Mokolo	68 238	1.66	1.64	1.74
Mogalakwena	606 499	0.18	0.22	0.5
Nzhelele	200 027	0.51	0.53	0.58
Sand	1 025 167	1.28	1.1	1.3
Total	**1 965 588**	**0.85**	**0.79**	**0.94**

Source: Projections by Glen Steyn and Associates, based on Census 2001, Census 2011, DWS Form G settlements in Limpopo and the Limpopo Spatial Rationale

The Study Area is expected to grow at less than 1% per year until 2040. Population growth will be concentrated in the Mokolo and Sand catchments, which is where water requirements will also increase most rapidly albeit from a lower base in Mokolo. Population growth in the Lephalala catchment is expected to be very low at 0.46%/a between 2011 and 2020, because there are no growth point settlements in this catchment.

In the Mokolo catchment, by contrast, average population growth remains above 1.6%/a for the entire forecast period and rises above 1.7%/a between 2030 and 2040. This is mainly the result of anticipated in-migration that could be driven by coal mining and electricity generation investments west of the Lephalale-Marapong urban complex. The Integrated Project Scoping Report that was compiled for Lephalale in 2010 was used to develop an understanding of the future employment requirements[8] and population growth estimates were made from these requirements. Within the Mokolo catchment, Lephalale town is expected to grow at 2.5%/a and Marapong[9] at 1.5%/a.

Within the Sand catchment, the average population growth rate ranges from 1.1% to 1.3% per year across the different stages of the project horizon, but this average disguises a wide range from negative growth rates in many remote rural settlements, to an average rate of 5% per year for Musina town. High, but gradually declining growth rates are also expected for Polokwane City. Population growth in Louis Trichardt could accelerate from 2020 when new coal mines in the Soutpansberg come into operation.

Within the Mogalakwena catchment, population growth for Mokopane and Mahwelereng towns were elevated to 2%/a to accommodate anticipated in-migration for new mining projects on the Platreef. Most of the other settlements in this catchment are likely to experience out-migration and negative population growth.

Low population growth is also expected for the Nzhelele catchment, due to the scattered settlement pattern, as well as the absence of growth points and job-creating investment projects. Some of the anticipated coal mining developments in the Nzhelele catchment are in close proximity to the eastern boundary of the Sand catchment. Residential growth in response to the new mines is likely to be located in Louis Trichardt town, which is in the Sand catchment, rather than in the existing rural settlements that are close to the mines. The local municipality will have to be vigilant to prevent the mushrooming of informal squatter settlements on the fringes of the new mines. Mine recruitment procedures must also be informed by the potential impacts on the local residential settlement pattern.

As indicated before, this planning population concept that was used for the population growth projections was also used by DWS in Limpopo in 2013 to reconcile their demographic information with that of Statistics South Africa. It was also used as the demographic basis for the projection of future domestic water requirements in the Capricorn District Water Services Master Plan of 2014.

[8] The timing of some of the anticipated project start and completion dates have changed and these changes were taken into consideration

[9] Future in-migration to Marapong could be capped by the fact that 1,800 construction workers at Medupi will become redundant from 2016 onwards and a similar number in the following year. Many of these workers are likely to stay in the area in the hope of finding work at new projects

3 DOMESTIC WATER AND SANITATION SERVICE LEVELS

3.1 WATER SERVICE LEVELS

Almost 18.4% of households in the Limpopo Province have piped water inside their dwellings. This service level is considerably higher at 23.8% in the Study Area, but it varies between the catchments. In Mokolo, for example, almost 51% of households have piped water inside their dwellings as indicated in the Table 3.1, while Lephalala has only 9.9%.

Table 3.1 Household water service levels in the Limpopo WMA North (2011)

Service Level	Lephalala	Mogala-kwena	Mokolo	Nzhelele	Sand	Total	Level %
Piped water inside dwelling	**1 326**	**25 605**	**8 050**	**9 899**	**74 414**	**119 294**	**24**
Piped water inside yard	3 860	60 972	5 263	15 733	102 274	188 102	37
Street tap less than 200 m from dwelling	6 247	28 434	941	17 771	49 536	102 929	21
Street tap between 200m and 500m from dwelling	1 261	8 326	417	6 923	15 605	32 532	7
Street tap between 500m and 1000m from dwelling	374	3 253	227	3 299	5 841	12 994	3
Street tap more than 1 km from dwelling	57	1 351	274	2 009	2 683	6 374	1
No access to piped (tap) water	262	11 180	660	9 171	18 582	39 855	8
Total	**13 387**	**138 707**	**15 833**	**64 825**	**268 935**	**502 080**	**100**
HHs Below RDP %	15	17	10	33	16	18	18
Inside Dwelling %	10	19	51	15	28	24	24
Yard Connections %	29	44	33	24	38	37.4	37.4
Street tap <200m %	47	21	6	27	18	20.5	20.5

Source: Stats SA, Census 2011

It should be pointed out that the incidence of piped water inside dwellings (23.8% on average) is lower than the projected urbanisation rate of 36.2% for the Study Area. It means that the water service level in some places that are classified as urban is limited to yard connections. Lephalala is the only catchment with a dwelling connection level that is higher than its urbanisation rate, despite the fact that it has the lowest incidence of dwelling connections of all the catchments in the Study Area.

It is assumed that most of the households in settlements that are classified as urban but that do not have dwelling connections, will have yard connections. Dwelling and yard connections together account for 61.2% of households in the Study Area, compared to the urbanisation rate of 36.2%. The implication is that at least 25% of households in the Study Area have dwelling or yard connections despite the fact that they live in settlements that are classified as rural.

Household water services that are less than a street tap within 200m of the house are considered to be below Reconstruction and Development Programme (RDP) standards. This applies to 18.3% of households in the WMA, but once again the incidence ranges from 33% below RDP in Nzhelele catchment, to only 10% below RDP in the Mokolo catchment. This information is illustrated in **Figure 3.1**.

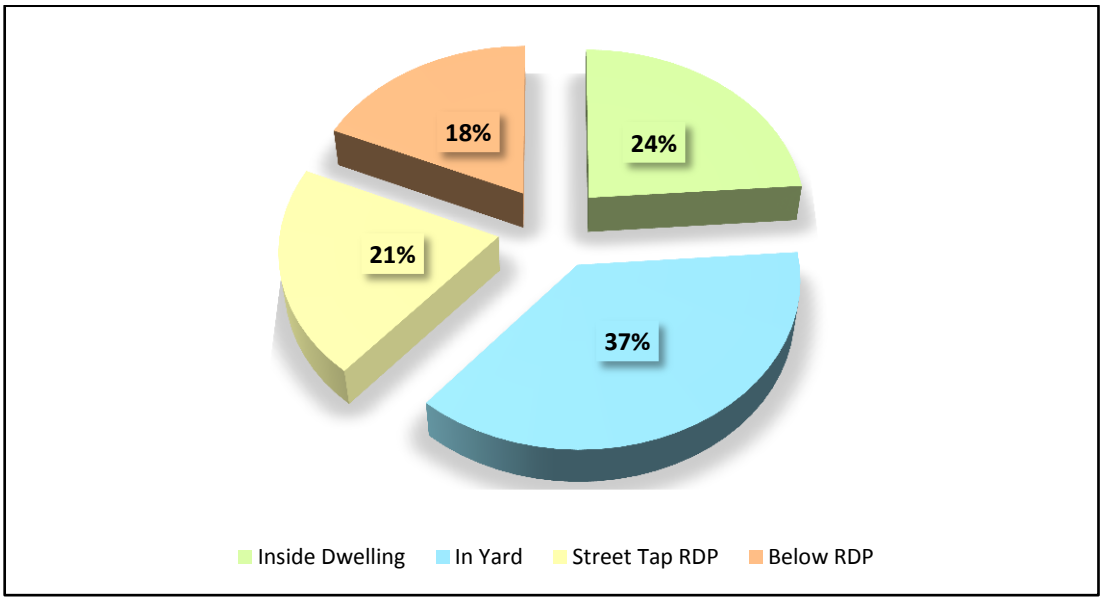


Figure 3.1 Household water service levels in Limpopo WMA North (2011)

The high service level (piped water inside dwellings) for the Mokolo and Sand catchments can be seen in **Figure 3.1**, as well as the high incidence of water services below RDP standards in the Nzhelele catchment. The Lephalala catchment has the highest incidence of standpipes within 200 meters of dwellings, which is within the RDP standard prescription.

Almost 74% of households in the Study Area are connected to a water scheme, compared to 62.7% for Limpopo Province. Scheme connections serve more than 90% of households in the Mokolo catchment, but less than 60% in the Nzhelele catchment (see **Table 3.2**).

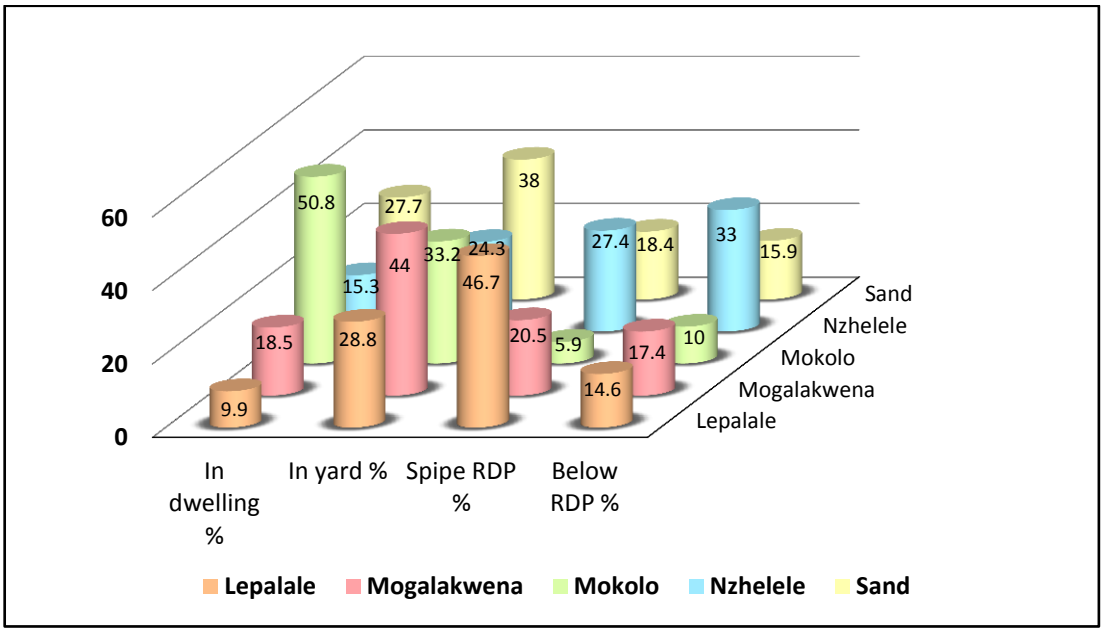


Figure 3.2 Household water service levels per catchment

Table 3.2 Primary household sources of water in Limpopo WMA North (2011)

Source of Water	Lephalala	Mogala-kwena	Mokolo	Nzhelele	Sand	Total	Level %
Regional / local water scheme (operated by WSP)	**9 639**	**98 774**	**14 304**	**38 404**	**209 073**	**370 194**	**74**
Borehole	2 549	20 294	509	8 626	28 367	60 345	12
Spring	13	922	8	2 593	796	4 332	1
Rain water tank	43	820	26	186	1 132	2 207	0
Dam / pool / stagnant water	405	3 437	114	5 008	5 081	14 045	3
River/stream	22	1 710	15	3 032	2 099	6 878	1
Water vendor	236	3 290	73	4 469	12 349	20 417	4
Water tanker	405	5 296	461	971	4 851	11 984	2
Other	71	3 454	321	1 507	5 137	10 490	2
Total	**13 383**	**137 997**	**15 831**	**64 796**	**268 885**	**500 892**[10]	**100**
Scheme %	72.0	71.0	90.3	59.2	77.7	73.7	73.7
Borehole %	19.0	14.6	3.2	13.3	10.5	12.0	12.0
Spring/Pool/Stream	3.3	4.4	0.9	16.4	3.0	5.0	5.0

Source: Stats SA, Census 2011

The second most important primary water source is boreholes, from which 12% of households in the Study Area are served (compared to 14.8% for Limpopo Province). Lephalala catchment relies more heavily on boreholes, 19% of households.

[10] There are small variations in the datasets for different indicators in Stats SA Census 2001, which will not have a material effect for development planning purposes

Five percent of households, on average in the Study Area obtain their water from springs, pools or streams, compared to 11.7% in the Limpopo Province. More than 16% of households in the Nzhelele catchment are obliged to collect their water from springs, pools or streams. This applies to less than 1% of households in the Mokolo catchment.

Water service levels per catchment represent an important point of reference for the projection of residential water requirements.

3.2 SANITATION SERVICE LEVELS

Provincially, 62.2% of households are below RDP sanitation service levels in the sense that they have no sanitation facilities, or their pit latrines have no ventilation, or they have to use buckets or some other unimproved sanitation system.

The incidence of households below RDP sanitation service levels in the Study Area (53.7%) is lower than the provincial average, but again with considerable variation across the Study Area. In the Mokolo catchment, for example, only 22.1% of households are below RDP sanitation service levels, but in Mogalakwena catchment this is 61%, which is close to the provincial average (see **Table 3.3** and **Figure 3.3**).

The incidence of flush toilets (sewerage system and septic tanks) is 32.2%, which is below the urbanisation rate of 36.2%. The implication is that some households living in settlements that are classified as growth points and by implication as towns or urban areas, are using pit latrines.

Table 3.3 Sanitation service level for Limpopo WMA North (2011)

Sanitation Service Level	Lephalala	Mogala-kwena	Mokolo	Nzhelele	Sand	Total	Level %
None	195	5 193	801	2 554	9 458	18 201	3.6
Flush toilet (connected to sewerage system)	355	34 296	11 793	8 275	99 053	153 772	30.6
Flush toilet (with septic tank)	799	2052	259	548	4 621	8 279	1.6
Chemical toilet	20	1 211	21	502	1 349	3 103	0.6
Pit toilet with ventilation (VIP)	6 796	15 463	269	18 169	25 522	66 219	13.2
Pit toilet without ventilation	5 128	77 419	2 182	33 948	125 094	243 771	48.5
Bucket toilet	23	1046	129	301	1 355	2 854	0.6
Other	59	1232	381	489	2 454	4 615	0.9
Total	**13 383**	**137 997**	**15 831**	**64 796**	**268 885**	**502 187**	**100.0**
HHs Below RDP %	**40.4**	**61.0**	**22.1**	**57.5**	**51.4**	**53.7**	**53.7**

Source: Stats South Africa, Census 2011

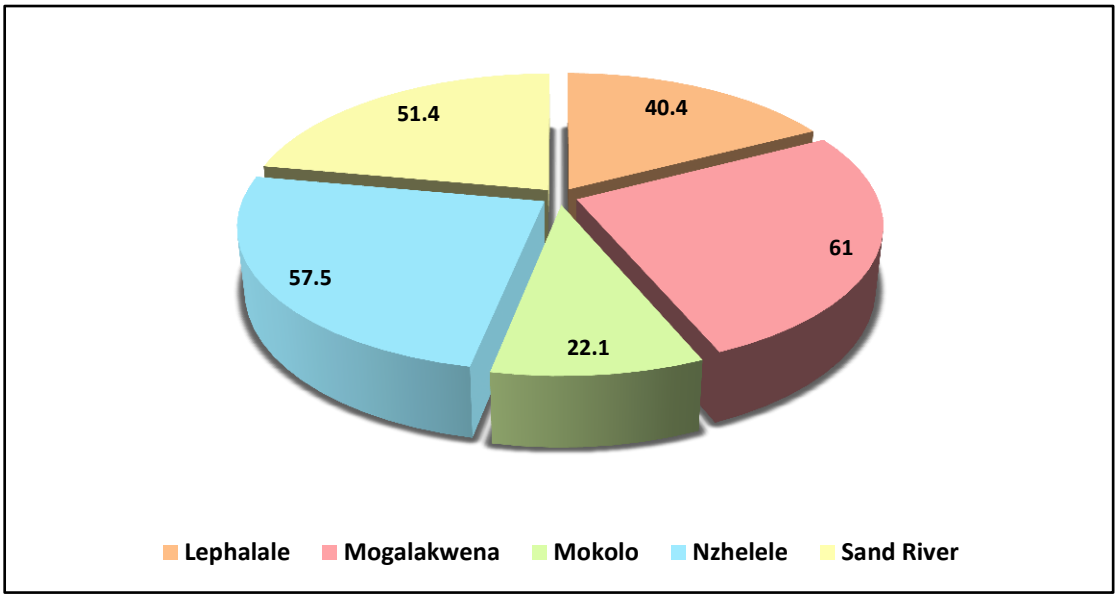


Figure 3.3 Households per catchment below RDP sanitation service levels (2011)

Pit toilets without ventilation are the most used level of sanitation. Their upgrading could be the basis of a sanitation improvement strategy in sparsely populated parts of the WMA. More than 50% of households in the Mogalakwena and Nzhelele catchments have pit toilets without ventilation.

Flush toilets are the conventional sanitation service standard for urban areas. The Free Basic Sanitation Implementation Strategy of 2009 was approved by the Minister of Water Affairs to guide Water Service Authorities (WSAs) in providing free basic sanitation to all citizens by 2014. The recommendation in terms of this strategy is 15 ℓ/c/d where there is water-borne sanitation.

For the sake of this domestic water requirement scenario formulation, the water implications of anticipated improvements in household sanitation service levels are assumed to be covered in the higher per capita water allocations according to the different water service levels. No additional provision is therefore made for the water requirements of improvements to sanitation service levels. However, it appears from some literature[11] that greater attention is required at the policy, planning and implementation levels to deal with challenges related to sanitation services.

[11] Basic Sanitation in South Africa, 2011

4 DOMESTIC WATER REQUIREMENT PROJECTIONS

It is evident from the 2011 census information provided above that the Study Area had a population of approximately 1.9 million people. The census results indicate that 24% of households had piped water in their dwellings, 38% had piped water in their yards and the remaining 38% had to use communal stand pipes or other sources.

Policy prescriptions set water consumption rates at 60 ℓ/c/d[12] for RDP services, 80 ℓ/c/d for yard connections and 180 ℓ/c/d for home connections. This is confirmed by information on actual consumption from municipalities, such as Polokwane[13], where home connection consumption was only slightly higher at 200 ℓ/c/d. The information enables a high-level estimate to be made for direct residential water consumption of almost 189 Mℓ/d for the Study Area in 2011. Provision must be made for water losses, which is assumed to be 25%[14] of direct consumption in urban areas and 30% in rural areas. These losses are primarily related to leaks in water networks, from the purification works to the consumer; and to wastage at street taps.

On the basis of the urban-rural ratio of 36:64, the weighted water loss is estimated to be 28.2% for the WMA.

Provision must also be made for peak demand, which is assumed to be 20% of direct consumption on the basis of water balance estimates in Polokwane LM. This peak demand factor is assumed to be constant across the project planning horizon.

Based on these assumptions, the total residential water requirement for the Study Area for 2011 can be estimated at approximately 102 million m^3/a. The calculations are reflected in **Table 4.1** for the entire planning period from 2011 to 2040.

The estimated population growth for the Study Area is 0.85%/a[15] from 2011 to 2020. This projection is based on all the projections at the settlement level as summarised in **Table 2.5**.

[12] Indicated by the DWS Director for Water Sector Support in Limpopo, August 2015
[13] See, for example, the Water Consumption Profile for Polokwane LM, Aug 2014
[14] Based on actual water consumption in Polokwane LM during 2013/14. The Sub-regional Infrastructure Master Plan for Makhado LM assumes 30% water losses. The estimate of non-revenue water at the national level is 36.8% of which 25% is assumed to be from physical losses. No official information is available in the Study Area for municipalities other than Polokwane
[15] The growth rate will be higher that this average in urban centres, such as Lephalale town, but considerably lower in small, scattered and remotely located rural settlements

Table 4.1 Residential water demand projections for Limpopo WMA North: Base-case

Year	Indicator	Home connections	Yard connections	Communal	Total
2011 losses 28.2%	Planning population	467 810	744 958	752 820	1 965 588
	Level of service	0.238	0.379	0.383	1.000
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	84 206	59 597	45 169	188 972
	Provision for water losses and peak demand	40 587	28 726	21 772	91 084
	Total residential requirement (million m³/a)	**45.5**	**32.2**	**24.4**	**102.2**
2020 losses 25.7%	Annual population growth rate %: 2011-2020				0.849
	Level of service	0.22	0.49	0.29	1.00
	Planning population	465 476	1 036 741	613 582	2 115 799
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	83 786	82 939	36 815	203 540
	Provision for water losses and peak demand	38 290	37 903	16 824	93 018
	Total residential requirement (million m³/a)	**44.6**	**44.1**	**19.6**	**108.2**
2030 losses 23%	Annual population growth rate %: 2021-2030				0.79
	Level of service	0.20	0.61	0.19	1.00
	Planning population	456 590	1 392 600	433 761	2 282 950
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	82 186	125 334	26 026	233 546
	Provision for water losses and peak demand	35 340	53 894	11 191	100 425
	Total residential requirement (million m³/a)	**42.9**	**65.4**	**13.6**	**121.9**
2040 losses 20%	Annual population growth rate %: 2031-2040				0.94
	Level of service	0.20	0.70	0.10	1.00
	Planning population	499 467	1 748 134	249 733	2 497 335
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	89 904	157 332	14 984	262 220
	Provision for water losses and peak demand	35 962	62 933	5 994	104 888
	Total residential requirement (million m³/a)	**45.9**	**80.4**	**7.7**	**134.0**

Estimates by Glen Steyn & Associates, 2015

It can be assumed, furthermore, that water service levels will increase progressively. This high-level scenario assumes that street tap water service levels will be reduced by one percentage point per year from 38% of the Study Area population in 2011 to 29% in 2020. Yard connection service levels must rise commensurately, to 49% in 2020. This assumption about the projected rate of service level improvement is based on the fact that the level of dwelling and yard connections in Limpopo improved by 11.3% from 41% in 2001 to 52.3%[16] in 2011. Water connection in dwellings is kept at the level of 2011, so that all the service level improvement is from street tap to yard connections.

The scenario also assumes that water losses can be reduced by 1% of the loss per year by way of effective conservation and demand management. There are no official guidelines relating to targets for water conservation and demand management although a situation is envisaged where water losses should be less than 20% of the water supplied. The assumption of a 1% reduction in losses per year makes it possible for the 20% loss target to be reached in a gradual manner by 2040. It must be emphasised that there will be capital cost and institutional capacity implications for this target to be reached.

On the basis of these assumptions the estimated residential water requirement could grow to 108.2 million m^3/a by 2020.

In the event that water losses cannot be reduced to 25.7%, but remains at 28.2%, then water requirements could grow by an additional 2 million m^3/a to 110 million m^3/a. The projection is also sensitive to the rate at which service levels are improved. In the event that communal water services are upgraded more rapidly so that 25% of households remain at that level instead of 29% as the scenario assumes, then an additional 1 million m^3/a of water will be required by 2020.

Population growth rates are in long-term decline. Population projections at the settlement level indicate that the average Study Area population growth rate could be 0.79% per year from 2021 to 2030. It is assumed that yard connections can be increased to 61% of all households during this period and that street tap service levels will decline commensurately to 19% of all households. Per capita water consumption is assumed to increase to 90l per day for yard connection service levels. Water losses continue to be reduced at the rate of 1% of losses per year to 23% of direct consumption by 2030. Residential water requirements in the Study Area rise to 122 million m^3/a by 2030 on the basis of these assumptions.

If it is not possible to reduce water losses to 23% from 28.2% during the first period, then the total water requirement for the Study Area in 2030 will be higher at 126.3 million m^3/a.

For the last part of these water requirement projections it is estimated that the Study Area population will grow on average by 0.94% per year between 2030 and

[16] Stats SA Census 2001 and 2011

2040. Yard connection services are raised to 70% of all households and only 10% remain reliant on street taps. The provision for water losses is reduced to 20% of direct consumption as a result of effective conservation and demand management. Projected residential water requirements increase to 134 million m^3/a in the Study Area on the basis of these assumptions.

An alternative scenario is to assume that water losses cannot be reduced at all and that the improvement in water service levels will be slower, so that 20% of households are still on communal services by 2040. In this event, the projected residential water requirement will be 137.8 million m^3/a as indicated in **Table 4.2** compared to 134 million m^3/a in the base case.

The impact of not reducing water losses is more significant than the slower rate of service level improvement. An additional 7.8 million m^3/a will be required by 2040 if water losses are not reduced at all from current levels of approximately 28% of direct consumption. Only 4 million m^3/a will be saved by the slower rate of development that is projected in the alternative scenario. Loss reduction is therefore a more effective strategy to contain water requirements than to slow down the improvement of service levels.

The results of the two scenarios are very similar and it is therefore reasonable to use the base case for the purpose of estimating and projecting residential water requirements.

Residential water requirements from the five catchments are significantly different due to the difference in population numbers and water service levels. The Sand catchment accounted for 54.6% of residential water requirements in the WMA in 2011 and for 51% of the population. By contrast, Lephalala catchment accounted for only 2.7% of the residential water requirements in the WMA and for 3% of the population. This is illustrated in **Figure 4.1**.

The composition of residential water requirements per catchment is likely to change over time as some catchments have greater water service delivery backlogs to eradicate and others have higher population (and economic) growth rates. The Sand catchment, for example, can be expected to increase its relative residential water requirements in the WMA to 58.1% by 2040 due to rapid population growth that will be driven by urbanisation and new project investments.

Table 4.2 Alternative scenario for residential water requirements

Year	Indicator	Home connections	Yard connections	Communal	Total
2011	Planning population	467 810	744 958	752 820	1 965 588
	Level of service	0.238	0.379	0.383	1.000
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	84 206	59 597	45 169	188 972
	Provision for water losses and peak demand	40 587	28 726	217 726	91 084
	Total residential requirement (million m³/a)	**45.5**	**32.2**	**24.4**	**102.2**
2020	Annual population growth rate %: 2011-2020				0.85
	Level of service	0.22	0.48	0.30	1.00
	Planning population	465 476	1 015 583	634 740	2 115 799
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	83 786	81 247	38 084	203 117
	Provision for water losses and peak demand	40 385	39 161	18 357	97 902
	Total residential requirement (million m³/a)	**45.3**	**43.9**	**20.6**	**109.9**
2030	Annual population growth rate %: 2021-2030				0.79
	Level of service	0.20	0.55	0.25	1.00
	Planning population	456 590	1 255 623	570 738	2 282 950
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	82 186	113 006	34 244	229 437
	Provision for water losses and peak demand	39 614	54 469	16 506	110 588
	Total residential requirement (million m³/a)	**44.5**	**61.1**	**18.5**	**124.1**
2040	Annual population growth rate %: 2031-2040				0.94
	Level of service	0.20	0.60	0.20	1.00
	Planning population	499 467	1 498 401	499 467	2 497 335
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	89 904	134 856	29 968	254 728
	Provision for water losses and peak demand	43 334	65 001	14 445	122 779
	Total residential requirement (million m³/a)	**48.6**	**72.9**	**16.2**	**137.8**

Table 4.3 Residential water requirement projections per catchment (million m^3/a)

Catchment	2011	2020	2030	2040
Lephalala	2.8	3.2	3.6	3.9
Mokolo	4.6	5.2	6.1	7.0
Mogalakwena	29.9	30.2	32.4	33.3
Nzhelele	9.0	9.7	11.1	12.0
Sand	55.8	60.7	69.4	77.8
Total	**102.2**	**109.0**	**122.6**	**134.0**
Sand % of total	54.6	55.7	56.6	58.1
Lephalala % of total	2.7	2.9	3.0	2.9
Mokolo % of total	4.5	4.8	5.0	5.2
Mogalakwena % of total	29.3	27.7	26.4	24.9
Nzhelele % of total	8.8	8.9	9.0	8.9

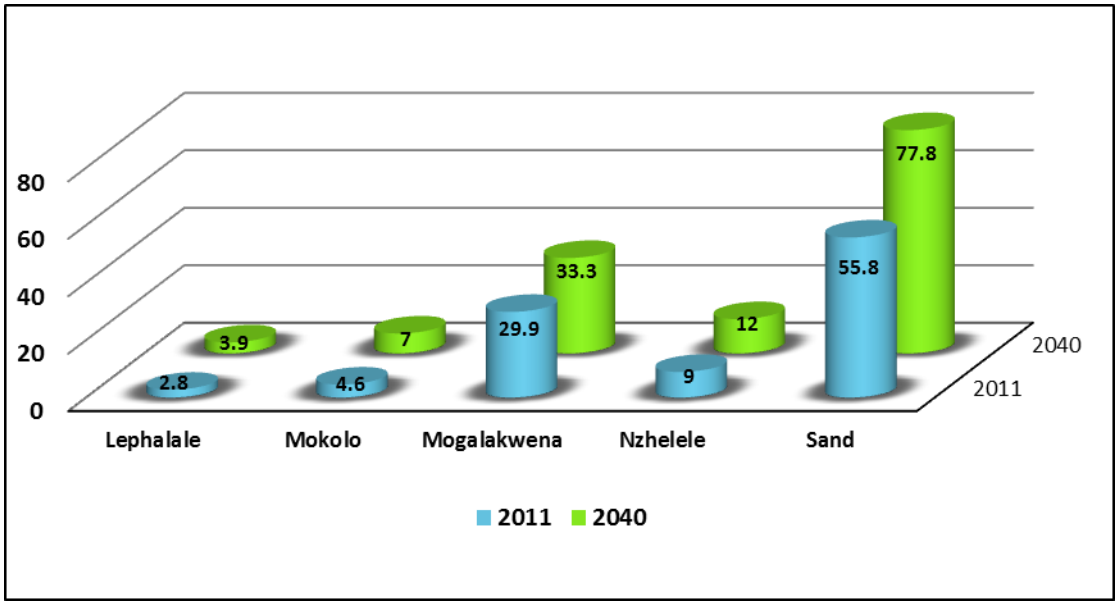


Figure 4.1 Residential water requirements per catchment (million m^3/a)

Projections of residential water demand are disaggregated per catchment in Table 4.4 to Table 4.8. These projections are based on the planning populations of the settlements in the catchment, the water service levels and the anticipated population growth rates per settlement. Water losses are estimated to be the weighted average of 25% for urban and 30% for rural settlements in the Study Area in 2011. A 1% reduction in water losses is assumed per year due to effective water demand and conservation management. It is assumed furthermore, that losses will not exceed 20% by 2040. The assumptions underlying the projections are similar to the assumptions that were discussed for the total WMA residential water requirements that are contained in Table 4.1.

Table 4.4 Projected residential water requirements or the Lephalala catchment

Year	Indicator	Home connections	Yard connections	Communal	Total
2011 losses 29.7%	Planning population	6 504	18 932	40 223	65 658
	Level of service	0.10	0.29	0.61	1.00
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	1 171	1 515	2 413	5 099
	Provision for water losses and peak demand	582	753	1 199	2 534
	Total residential requirement (million m³/a)	**0.6**	**0.8**	**1.3**	**2.8**
2020 losses 27%	Annual population growth rate %: 2011-2020				0.46
	Level of service	0.15	0.40	0.45	1.00
	Planning population	10 257	27 352	30 771	68 379
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	1 846	2 188	1 846	5 881
	Provision for water losses and peak demand	868	1 028	868	2 764
	Total residential requirement (million m³/a)	**1.0**	**1.2**	**1.0**	**3.2**
2030 losses 24.3%	Annual population growth rate %: 2021-2030				0.49
	Level of service	0.15	0.60	0.25	1.00
	Planning population	10762	43 047	17 936	71 745
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	1937.1	3 874	1 076	6 888
	Provision for water losses and peak demand	858.1	1 716	477	3 051
	Total residential requirement (million m³/a)	**1.0**	**2.0**	**0.6**	**3.6**
2040 losses 20%	Annual population growth rate %: 2031-2040				0.49
	Level of service	0.15	0.75	0.10	1.00
	Planning population	11 294	56 472	7 530	75 296
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	2 033	5 083	452	7 567
	Provision for water losses and peak demand	813	2 033	181	3 027
	Total residential requirement (million m³/a)	**1.0**	**2.6**	**0.2**	**3.9**

The rapid increase in the projected water requirements from 2011 to 2040 is driven mainly by the expected improvement in water service levels from the poor level that prevails at present. Population growth is expected to remain low because settlements are small and scattered and without any local economic base to retain or attract people of working age.

The Mokolo catchment, see **Table 4.5**, is expected to be very different. Current service levels are high and rapid population growth is expected as a result of investments in the coal mining and electricity generation industries. These investments are considered in the industrial water requirement section below.

Lephalale town is expected to host many people who will be working on the pipeline of new projects in the adjacent Matlabas catchment.

Table 4.5 Projected residential water requirements for the Mokolo catchment

Year	Indicator	Home connections	Yard connections	Communal	Total
2011 losses 25.2%	Planning population	34 694	22 683	10 861	68 238
	Level of service	0.51	0.33	0.16	1.00
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	6 245	1 815	651.6	8 711
	Provision for water losses and peak demand	2 823	820	295	3 938
	Total residential requirement (million m³/a)	**3.3**	**1.0**	**0.3**	**4.6**
2020 losses 23%	Annual population growth rate %: 2011-2020				1.66
	Level of service	0.50	0.40	0.10	1.00
	Planning population	39 219	31 375	7 844	78 438
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	7 059	2 510	471	10 040
	Provision for water losses and peak demand	3 036	1 079	202	4 317
	Total residential requirement (million m³/a)	**3.7**	**1.3**	**0.2**	**5.2**
2030 losses 20.6%	Annual population growth rate %: 2021-2030				1.64
	Level of service	0.48	0.42	0.10	1.00
	Planning population	43 828	38 349	9 131	91 308
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	7 889	3 451	548	11 888
	Provision for water losses and peak demand	3 203	1401.3	222	4 827
	Total residential requirement (million m³/a)	**4.0**	**1.8**	**0.3**	**6.1**
2040 losses 20%	Annual population growth rate %: 2031-2040				1.74
	Level of service	0.46	0.44	0.10	1.00
	Planning population	49 315	47 171	10 721	107 206
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	8 877	4 245	643	13 765
	Provision for water losses and peak demand	3 551	1 698	257	5 506
	Total residential requirement (million m³/a)	**4.5**	**2.2**	**0.3**	**7.0**

The Mogalakwena catchment, see Table 4.6, has the second largest population in the WMA, but the lowest population growth rate due to outmigration. The Mokopane-Mahwelereng urban complex is the exception within this catchment. It has a substantial pipeline of potential investment projects, which may result in rapid population growth and increased water requirements at this growth point.

Table 4.6 Projected residential water requirements for the Mogalakwena catchment

Year	Indicator	Home connections	Yard connections	Communal	Total
2011 losses: 28.5%	Planning population	111 958	266 601	227 939	606 499
	Level of service	0.18	0.44	0.38	1.00
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	20 153	21 328	13 676	55 157
	Provision for water losses and peak demand	9 774	10 344	6 633	26 751
	Total residential requirement (million m³/a)	**10.9**	**11.6**	**7.4**	**29.9**
2020 losses 26%	Annual population growth rate %: 2011-2020				0.18
	Level of service	0.18	0.52	0.30	1.00
	Planning population	110 935	320 478	184 891	616 303
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	19 968	25 638	11 094	56 700
	Provision for water losses and peak demand	9 185	11 794	5 103	26 082
	Total residential requirement (million m³/a)	**10.6**	**13.7**	**5.9**	**30.2**
2030 losses 23.3%	Annual population growth rate %: 2021-2030				0.22
	Level of service	0.16	0.64	0.20	1.00
	Planning population	100 793	403 173	125 992	629 958
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	18 143	36 286	7 560	61 988
	Provision for water losses and peak demand	7 856	15 712	3 273	26 841
	Total residential requirement (million m³/a)	**9.5**	**19.0**	**4.0**	**32.4**
2040 losses 20%	Annual population growth rate %: 2031-2040				0.5
	Level of service	0.15	0.75	0.10	1.00
	Planning population	97 282	486 412	64 855	648 549
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	17 511	43 777	3 891	65 179
	Provision for water losses and peak demand	7 004	17 510	1 557	26 072
	Total residential requirement (million m³/a)	**8.9**	**22.4**	**2.0**	**33.3**

Population growth in the Nzhelele catchment, see Table 4.7, is also expected to be low due to the scattered and low-order settlement pattern. No significant investment projects are anticipated other than coal mines by Coal of Africa Limited (CoAL). New residential developments associated with these new mines are expected to be located in the nearby Louis Trichardt town, which is in the adjacent Sand catchment.

The increase in projected residential water requirements within the Nzhelele catchment is mostly a function of anticipated improvements in water service levels.

Table 4.7 Projected residential water requirements for the Nzhelele catchment

Year	Indicator	Home connections	Yard connections	Communal	Total
2011 losses: 28.7%	Planning population	30 545	48 546	120 935	200 027
	Level of service	0.15	0.24	0.60	1.00
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	5 498	3 884	7 256	16 638
	Provision for water losses and peak demand	2 678	1 891	3 534	8 103
	Total residential requirement (million m³/a)	**3.0**	**2.1**	**3.9**	**9.0**
2020 losses 26%	Annual population growth rate %: 2011-2020				0.51
	Level of service	0.15	0.45	0.40	1.00
	Planning population	31 377	94 131	83 672	209 180
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	5 648	7 531	5 020	18 199
	Provision for water losses and peak demand	2 598	3 464	2 309	8 371
	Total residential requirement (million m³/a)	**3.0**	**4.0**	**2.7**	**9.7**
2030 losses: 23.4%	Annual population growth rate %: 2021-2030				0.53
	Level of service	0.15	0.60	0.25	1.00
	Planning population	33 032	132 126	55 053	220 210
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	5 946	11 891	3 303	21 140
	Provision for water losses and peak demand	2 580	5 161	1 434	9 175
	Total residential requirement (million m³/a)	**3.1**	**6.2**	**1.7**	**11.1**
2040 losses 20%	Annual population growth rate %: 2031-2040				0.58
	Level of service	0.15	0.75	0.10	1.00
	Planning population	34 935	174 673	23 290	232 897
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	6 288	15 721	1 397	23 406
	Provision for water losses and peak demand	2 515	6 288	559	9 363
	Total residential requirement (million m³/a)	**3.2**	**8.0**	**0.7**	**12.0**

The Sand catchment accounts for the bulk of the current and projected residential water requirements in the WMA as indicated in Table 4.8. The population is large, population growth is high and there is scope for increased levels of water service delivery.

Table 4.8 Projected residential water requirements for the Sand catchment

Year	Indicator	Home connections	Yard connections	Communal	Total
2011 losses: 28%	Planning population	283 621	389 807	351 739	1 025 167
	Level of service	0.28	0.38	0.34	1.00
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	51 052	31 185	21 104	103 341
	Provision for water losses and peak demand	24 505	14 969	10 130	49 604
	Total residential requirement (million m³/a)	**27.6**	**16.8**	**11.4**	**55.8**
2020 losses: 25.5%	Annual population growth rate %: 2011-2020				1.28
	Level of service	0.25	0.50	0.25	1.00
	Planning population	285 875	571 749	285 875	1 143 499
	Consumption rate (ℓ/c/d)	180	80	60	
	Total consumption (kℓ/d)	51 458	45 740	17 153	114 350
	Provision for water losses and peak demand	23 413	20 812	7 804	52 029
	Total residential requirement (million m³/a)	**27.3**	**24.3**	**9.1**	**60.7**
2030 losses: 23%	Annual population growth rate %: 2021-2030				1.10
	Level of service	0.23	0.57	0.20	1.00
	Planning population	292 038	723 746	253 946	1 269 729
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	52 567	65 137	15 237	132 941
	Provision for water losses and peak demand	22 604	28 009	6 552	57 165
	Total residential requirement (million m³/a)	**27.4**	**34.0**	**8.0**	**69.4**
2040 losses 20%	Annual population growth rate %: 2031-2040				1.28
	Level of service	0.214	0.686	0.100	1.000
	Planning population	306 745	983 304	143 339	1 433 387
	Consumption rate (ℓ/c/d)	180	90	60	
	Total consumption (kℓ/d)	55 214	88 497	8 600	152 312
	Provision for water losses and peak demand	22 086	35 399	3 440	60 925
	Total residential requirement (million m³/a)	**28.2**	**45.2**	**4.4**	**77.8**

Water conservation and demand management will have a significant impact on residential water requirements. If losses cannot be reduced from the estimated current levels of 28% of direct consumption, then the projected residential water requirements could increase by 4.5 million m^3/a over the forecast period. Under these conditions the projected requirement in 2040 will be 82.3 million m^3/a instead of 77.8 million m^3/a when gradual improvements in water losses to 20% are assumed.

No provision is made for residential water requirements in the Matlabas catchment at this stage, because it is assumed that all employees at new projects

will reside in Lephalale town. Their residential water requirements are therefore reflected in the Mokolo catchment.

In the event that settlement development is formalised and implemented before 2040, it will become necessary to reallocate commensurate residential water requirements from Mokolo to the Matlabas catchment.

5 HOUSEHOLD INCOME DISTRIBUTION

Income distribution information from Census 2011 can be classified according to three income groups. Severe poverty conditions are assumed to prevail for households earning less than R 19 600/a or R 1 633/month. These households will generally be unable to pay for the cost of municipal services, although they may be in a position to contribute time and labour for community work as payment for municipal services. On average, 55.5% of households in Limpopo Province fall into this category.

The incidence of severe poverty in the Study Area is lower at 51%. Within this WMA, the income distribution of households at the catchment level is reflected in Table 5.1. The highest percentage of households in severe poverty (54.5%) is to be found in the Nzhelele catchment, followed by Mogalakwena catchment with 54.3%. Mokolo catchment has the lowest incidence of absolute poverty at 31.6%, followed by Lephalala with 47%.

Low to middle-income households are classified as those with incomes between R 19 601 and R 76 400/a. These households should be in a position to contribute at least a portion of the cost of municipal services, even though they may be unable to pay the full cost. On average, 30.6% of households in Limpopo Province fall into this group. The incidence is slightly higher at 31.9% in the Study Area.

Table 5.1 Household income distribution per catchment in the Study Area

Income Level (Rand)	Lephalala	Mogala-kwena	Mokolo	Nzhelele	Sand	Total	Level %
No income	1 629	20 293	2 388	7 511	38 040	69 861	14
1 - 4 800	630	7 420	391	4 310	13 759	26 510	5
4801 - 9 600	1 327	14 889	738	8 216	25 533	50 703	10
9 601 - 19 600	2 707	32 996	1 503	15 080	56 249	108 535	22
19 601 - 38 200	3 002	31 924	2 748	14 434	54 715	106 823	21
38 201 - 76 400	2 036	14 159	2 458	5 851	28 651	53 155	11
76 401 - 153 800	1 323	8 578	2 073	3 905	19 971	35 850	7
153 801 - 307 600	561	5 665	1 790	2 950	16 694	27 660	6
307 601 - 614 400	124	2 318	1 249	1 526	10 041	15 258	3
614 001 - 1 228 800	28	511	400	376	3 194	4 509	1
1 228 801 - 2	7	182	102	98	812	1 201	0
2 457 601 or more	5	156	56	103	643	963	0
Unspecified	1	1		1	10	13	0
Total	**13 380**	**139 166**	**15 896**	**64 402**	**268 384**	**501 228**	**100**
Poverty %	**47**	**54**	**32**	**55**	**50**	**51**	**51**
Mid Income %	**38**	**33**	**33**	**32**	**31**	**32**	**32**
High Income %	**15**	**13**	**36**	**14**	**19**	**17**	**17**

Source: Stats SA, Census 2011

Households earning more than R 76 400/a are classified as high-income for the purpose of this analysis. The group represents 13.9% of all households in Limpopo Province, making it the smallest of the three income groups. Households in this group should be expected to pay full cost recovery rates for the services that they receive. The Study Area has 17.1% of its households in this high-income group, but it varies considerably from a low of 12.6% in the Mogalakwena catchment to a high of 35.7% in the Mokolo catchment. This household income distribution information is reflected in Figure 5.1 and Figure 5.2.

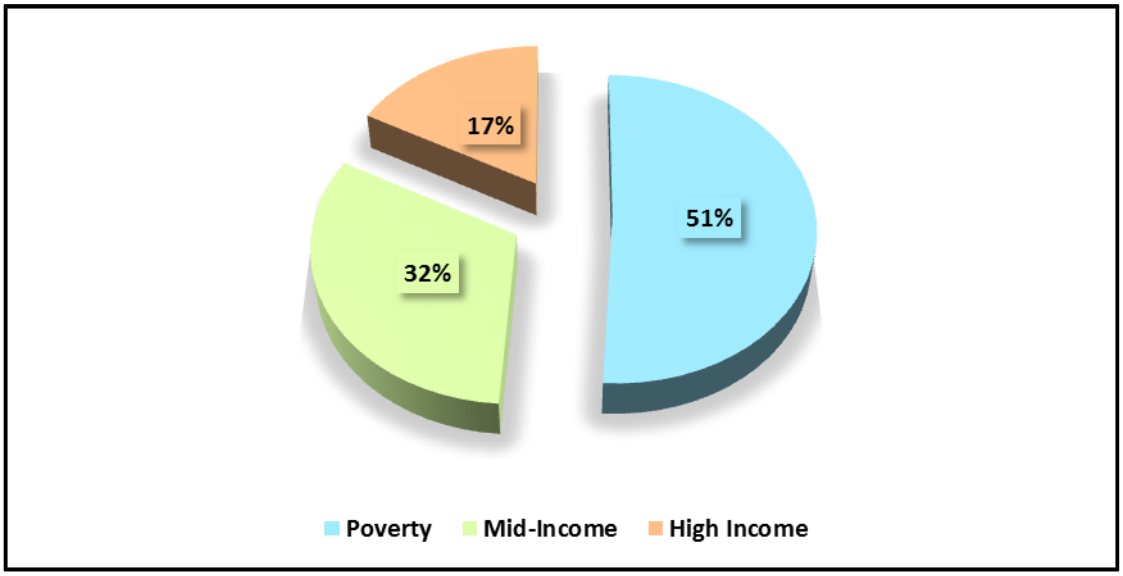


Figure 5.1 Primary household income groups in the Study Area

The wide disparity between catchments is evident. A more detailed analysis at the municipal level within catchment units can be conducted in order to identify the pockets of affordability more specifically if that is required for project planning purposes.

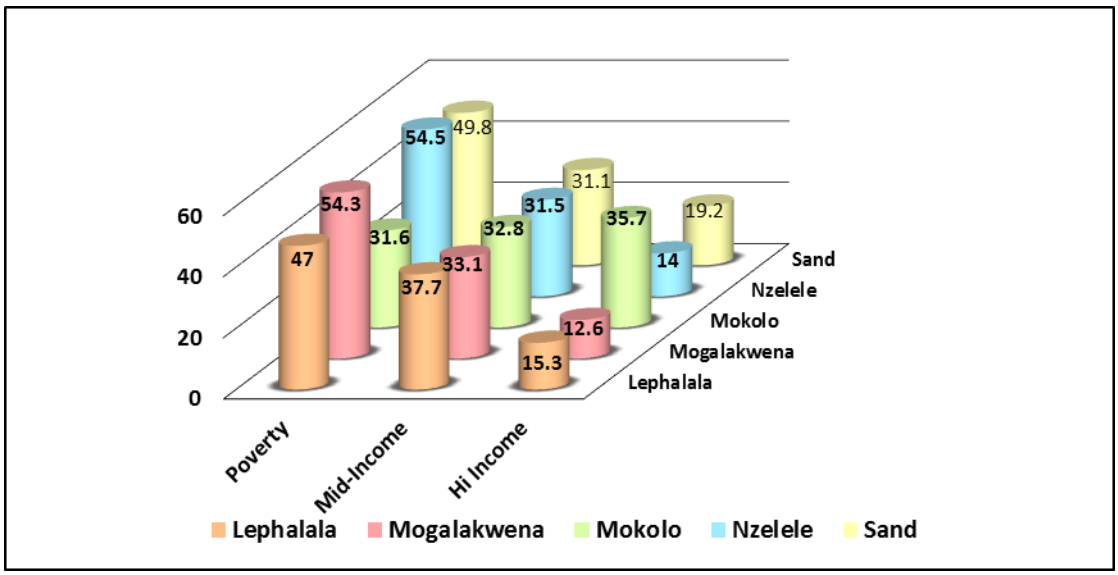


Figure 5.2 Household income distribution per catchment (2011 %)

Almost 63% of households in the Study Area have home or yard water connections, whereas 51% cannot afford to pay for water. This means that at least 12% of households have water services that are above their affordability levels and they probably use more water than the official Department's planning allocation of 60 ℓ/c/d. Affordability constraints could restrict rapid improvements in water service levels beyond RDP standards. This has a direct impact on the service delivery targets that are used in the scenario planning process. However, as indicated, the water requirement projections are more sensitive to assumptions about the reduction in water losses than to the rate of improvement in water service delivery.

6 INDUSTRIAL WATER REQUIREMENTS

The purpose of this section is to estimate the first order nature and magnitude of non-domestic water requirements for the Limpopo-North Water Reconciliation Strategy. It is primarily mining and industrial requirements, but includes retail, offices and services, as well as schools. This will be added to domestic requirements. Agricultural requirements are not included in this estimate.

Current and new mining and industrial developments are located primarily in the Sand, Mokolo and Mogalakwena catchments. There are no significant mining or industrial developments in the Matlabas, Lephalala or Nzhelele catchments.

Within the Sand catchment, Polokwane LM currently has the largest non-domestic water requirement, amounting to approximately 9.50 million m^3/a[17], including retail, offices and the University. This requirement could grow to 16.80 million m^3/a by 2035 and to 18.26 million m^3/a by 2040, mostly due to new mining and industrial developments. **Table 6.1** provides some detail on these projections. Communal livestock requirements are excluded for the purpose of this report.

Table 6.1 Total estimated water requirement in Polokwane LM: 2014-2035 (million m^3/a)

	User Group	2014	2020	2030	2035
1	Domestic	44.66	49.99	62.87	72.76
2	Angloplat Smelter	0.73	0.73	1.10	1.10
3	Industry	3.24	4.05	6.07	7.59
4	Mining	0.37	1.10	1.46	1.46
5	Communal livestock	0.99	0.99	0.99	0.99
6	Shopping centres	0.84	0.89	0.98	1.03
7	Office blocks	0.72	0.76	0.83	0.88
8	Schools	0.79	0.79	0.79	0.79
9	Hospitals	0.35	0.37	0.40	0.42
10	Clinics	0.04	0.04	0.04	0.04
12	University of the North	0.55	0.68	1.03	1.08
12	Other (Prison, health clubs, police, municipality)	1.83	1.94	2.13	2.24
	Total	**55.09**	**62.32**	**78.70**	**90.37**

Source: Telephonic enquiries and estimates by Glen Steyn and Associates, 2014

Current water sources are mainly from the Ebenezer Dam and Olifantspoort Weir, which will be adequate until 2026, provided that proposed infrastructure expansions are implemented.

[17] Socio-economic Report for the Proposed Upgrade of Ebenezer and Olifantspoort Schemes, LNW Aug 2014

Four[18] new coal mines are expected to be developed by CoAL in the Soutpansberg, commencing with the Makhado Mine in 2016. The will require an average of 3.65 million m^3/a of water for each mine at full capacity and all four mines are expected to be fully operational by 2030. A preliminary schedule for the operational commencement dates of the mines is provided in **Table 6.2**. Life of mine in each case is approximately twenty years. Operational overlaps between the four mines imply that water will be required for 60 years and will peak at 14.24 million m^3/a when all the mines are in operation.

Table 6.2 Estimated water requirements for mining in Makhado (million m^3/a)

Mine	2011	2020	2030
Makhado	0	3.32	3.32
Chapudi	0	0.00	4.02
Mopane	0	0.00	2.78
Generaal	0	0.00	4.02
Total	**0**	**3.32**	**14.13**

*Source: Company records from Coal of Africa Ltd and confirmed in January 2014. The anticipated location of the four mines, between the towns of Musina and Makhado, is reflected in **Figure 10**.*

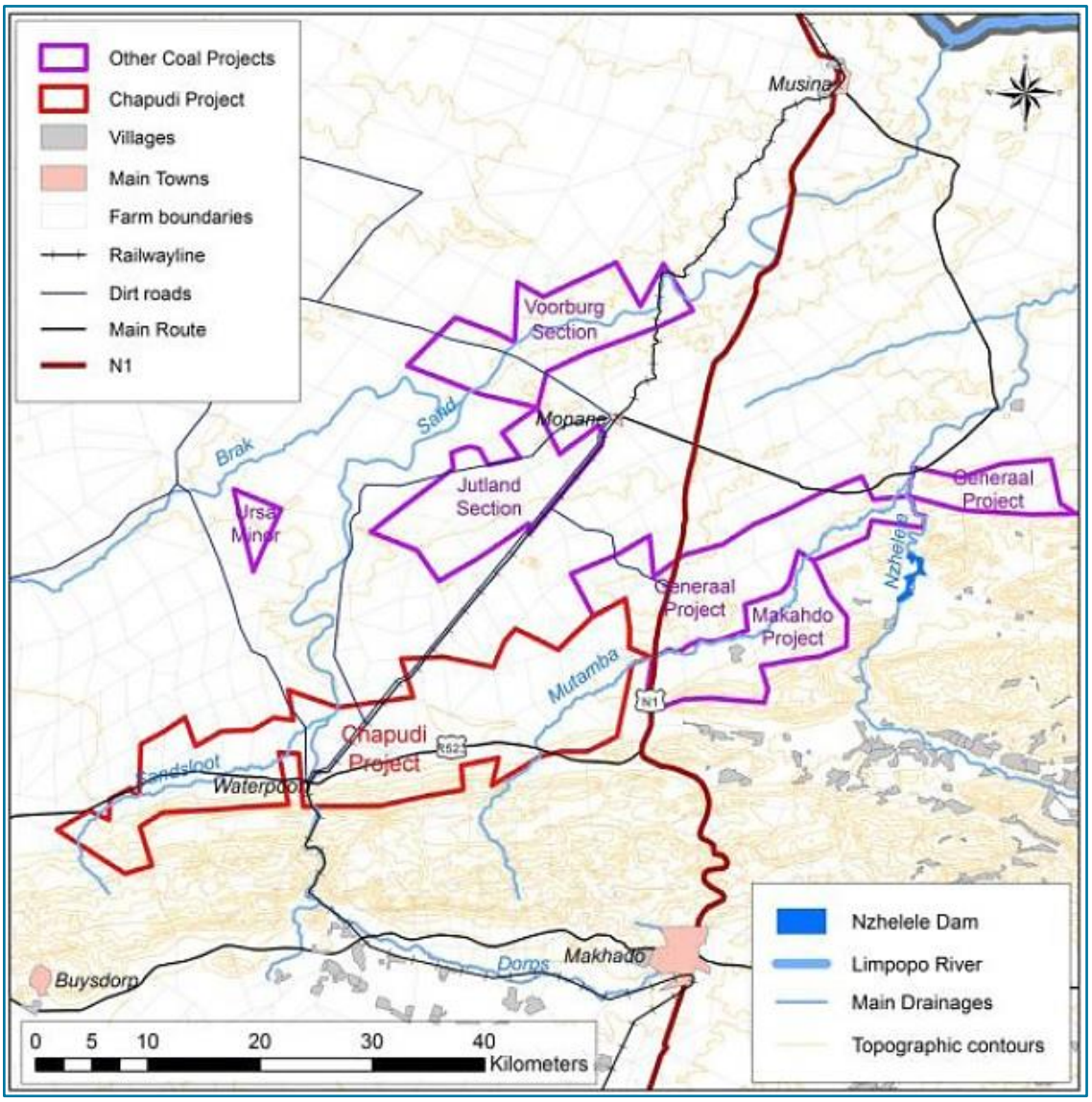
Current industrial and retail water requirements for Makhado LM are estimated to be 1.10 million m^3/a and could grow to 1.83 million m^3/a in 2020 and to 5.48 million m^3/a in 2040 in response to coal mining developments in the Soutpansberg, as referred to above.

Venetia Diamond Mine in Musina is in the process of being expanded. The current water requirement is 4.38 million m^3/a[19], which is not expected to change, because the expanded mine will have a shaft underground. This will be less water-intensive than the existing opencast mine.

A Special Economic Zone (SEZ) with a focus on logistics and trade is currently being planned for Musina by the National Department of Trade and Industry. Preliminary estimates from the Pre-feasibility Study suggest a water requirement of 14.61 million m^3/a from 2020. The development of the Limpopo Eco-Industrial Park (LEIP) is also under consideration in Musina. Initial estimates of water requirements are also 14.61 million m^3/a.

The total non-domestic water requirements for the Sand catchment over the forecast period are summarised in **Table 6.3**. This table excludes agriculture.

[18] Musina-Makhado Water Supply Scheme: Socio-economic component, 2014
[19] Engineering News, 1 Nov 2013



Source: WSM Leshika: Chapudi Groundwater Specialist Report 2013

Figure 6.1 Project locality of proposed new coal mines

Table 6.3 Summary of projected non-domestic water requirements in the Sand catchment (million m^3/a)

User	2011	2020	2030	2040
Polokwane LM	9.50	10.96	14.61	18.26
New CoAL mines	0.00	3.65	14.61	14.61
Makhado LM	1.10	1.83	3.65	5.48
Venetia Mine	4.38	4.38	4.38	4.38
Musina SEZ	0.00	7.30	14.61	14.61
LEIP	0.00	7.30	14.61	14.61
Total	**14.97**	**35.43**	**66.47**	**71.95**

Source: Estimates by Glen Steyn and Associates, 2015

Mines and industries that are located west of Lephalale town in the Mokolo catchment, currently use approximately 18.26 million m^3/a[20]. The two main drivers of industrial water requirement are Grootegeluk Coal Mine (Exxaro) and Matimba Power Station (Eskom). This figure could increase to 36.52 million m^3/a by 2020 and to 54.79 million m^3/a by 2030 due to a pipeline of projects that are currently underway. It includes the Medupi Power Station and expansion of Grootegeluk Coal Mine. Additional projects are still in the planning stage, such as the new Thabametsi Coal Mine of Exxaro[21] and the associated Independent Power Producer. Sources within the catchment are at full capacity and new developments will be supplied by the *Mokolo-Crocodile (West) River Water Augmentation Project* (MCWAP). It is therefore only the current mining and industrial water requirement that is reflected in this report.

A large opencast platinum mine, owned by Anglo American Platinum Ltd, currently operates in the Mogalakwena catchment. A significant expansion of the existing mine, as well as a pipeline of new platinum, iron and vanadium projects[22] are currently at different stages of planning, construction and development. Construction of the Platreef Mine commenced in 2014. The first blast[23] was in March 2015.

Current mining and industrial water consumption is likely to be in the order of 10.96 million m^3/a[24], some of which is sourced from wastewater treatment works and from boreholes. Mining and industrial consumption could increase to 25.57 million m^3/a by 2030 if the pipeline of planned projects is implemented. Water for new developments is planned to be provided from the *Olifants River Water Resources Development Project* (ORWRDP) and is not reflected in this report.

No mining and industrial water requirements are anticipated for the Matlabas, Lephalala and Nzhelele catchments as indicated above.

Water requirements for schools can be estimated from the number of children in the Study Area who are between the ages of 5 and 19 years. This is 30.8%[25] of the population, which amounts to 584 500 learners. They will need 10 ℓ/c/d, or 2.15 million m^3/a in total. Provision for 0.8 million m^3/a has already been made for Polokwane LM (Sand catchment, see **Table 6.1**), which requires provision to be made for an additional 1.35 million m^3/a for schools. Total non-domestic water requirements, excluding agriculture, are reflected in **Table 6.4**.

[20] Lephalale Integrated Project Scoping Report, 2010
[21] Exxaro Annual Report, 2014
[22] Scoping study completed by Bushveld Minerals in December 2014
[23] Ivanhoe Company website
[24] Personal communication with water services planners, company executives and consultants in the area during May 2015
[25] Derived from Census 2011 as a weighted average for the three DMs

Table 6.4 Total estimated non-domestic[26] water requirements in Limpopo WMA North (million m³/a)

Catchment	2011	2020	2030	2040
Sand	14.97	35.43	66.47	71.95
Mokolo[27]	18.26	18.26	18.26	18.26
Mogalakwena[28]	10.96	10.96	10.96	10.96
Matlabas	0.00	0.00	0.00	0.00
Lephalala	0.00	0.00	0.00	0.00
Nzhelele	0.00	0.00	0.00	0.00
Additional provision for schools	1.35	1.35	1.35	1.35
Total	**45.55**	**66.00**	**97.04**	**102.52**

Table 6.5 reflects the sum of residential and non-residential water requirements, but excluding agriculture. Residential water requirements are derived from the base-case planning scenario, see Table 4.1.

Table 6.5 Total estimated water requirements (million m³/a) in Limpopo WMA North[29]

Users	2011	2020	2030	2040
Residential	102.2	108.2	121.9	134.0
Non-residential[30]	45.6	66.0	97.0	102.5
Total	**147.8**	**174.2**	**218.9**	**236.5**

The total base-case projection for the Study Area increases from 147.8 million m³/a in 2011 to 236.5 million m³/a in 2040. Domestic water requirements are currently significantly higher than non-domestic requirements. The difference will decrease over time if all the planned mining and industrial projects are implemented and assuming that water conservation and demand management will be effective. In the absence of any improvement in water losses, domestic requirements could be 31.5 million m³/a higher in 2040.

Irrigation requirements are yet to be added and will exceed the combined requirements of domestic and non-domestic users that are reflected in Table 6.5.

[26] Excluding agriculture
[27] Excluding the water requirements that will be supplied from the Crocodile West
[28] Excluding the water requirements that will be supplied from the ORWRDP
[29] Excluding agriculture
[30] Excluding agriculture

7 SUMMARY

Limpopo WMA North covers six catchments, three DMs and 12 LMs. The Study Area had a population of approximately 1.9 million people in 2011. The Sand catchment alone accounts for more than 51% of the Study Area population and more than 40% of all the settlements. Matlabas catchment has no settlements and its farming community makes their own provision for household water consumption. Capricorn DM hosts almost 52% of the project population. Slightly more than 25% of the project population live in Waterberg DM and the remaining 23% live in Vhembe DM. Polokwane LM in the Capricorn DM is the largest single project host, with almost 600 000 people or 32% of the project population. Makhado and Mogalakwena LMs are also important hosts, with approximately 16% of the project population each.

The project population is expected to grow at less than 1% per year until 2040. Population growth will be concentrated in the Mokolo and Sand catchments, which is broadly where water requirements will also increase most rapidly. Population growth in the Lephalala catchment is expected to be very low at 0.46% per year between 2011 and 2020, because there are no growth point settlements or significant new economic activities anticipated in this catchment.

Almost 23% of households in the WMA have piped water inside their dwellings, compared to 18.3% for the entire Limpopo Province. This service level varies between the catchment units. In Mokolo almost 51% of households have piped water inside their dwellings while Lephalala has only 9.9%. Household water services that are less than a standpipe within 200m of the house are considered to be below RDP standards. This applies to 17.7% of households in the WMA, but the incidence ranges from 33% below RDP in the Nzhelele catchment, to only 10% below RDP in the Mokolo catchment. Almost 74% of households in the Study Area are connected to a water scheme, compared to 62.7% for Limpopo Province. Scheme connections are more than 90% of households in the Mokolo catchment, but below 60% in the Nzhelele catchment. Sanitation service levels are considerably worse than water service levels, although better than the provincial average.

Total residential water consumption for the Study Area for 2011 can be estimated at approximately 102 million m^3/a. The assumptions underlying this estimate are discussed in the report. Residential consumption is projected to increase to 108 million m^3/a in 2020 and to 122 million m^3/a in 2030. By 2040, residential water consumption could reach 134 million m^3/a.

Approximately 51% of households in the Study Area are considered too poor to pay for their water consumption. Only 17% can afford to pay the full cost of water services and the remaining 32% can pay for a portion of their water services. Almost 63% of households in the Study Area have home or yard water connections, whereas 51% cannot afford to pay for water. This means that at least 12% of households have water services that are above their affordability

levels and they probably use more water than the monthly RDP prescription of 6kℓ per household.

Household income levels may improve modestly over the forecast period as coal mining prospects are developed, especially in Lephalale and Makhado LMs. Household expectations regarding improved municipal services may rise more rapidly than affordability levels.

Non-residential water demand in the Study Area is estimated to have been 45.6 million m^3/a in 2011 and could increase to 102.5 million m^3/a by 2040 due to a pipeline of anticipated project investments in places such as Polokwane, Makhado, Musina and the Waterberg Coalfield.

The total domestic water requirements for the Study Area, residential and non-residential, are estimated to grow to about 237 million m^3/a in 2040 from 148 million m^3/a in 2011.

Table 7.1 Total estimated domestic water requirements (million m^3/a) in Limpopo WMA North

Users	2011	2020	2030	2040
Residential	102.2	108.2	121.9	134.0
Non-residential[31]	45.6	66.0	97.0	102.5
Total	**147.8**	**174.2**	**218.9**	**236.5**

The projection is sensitive to assumptions about new project establishment and commencement dates. The risk is that these projects may take longer to be completed, which will flatten the water requirement trajectory, at least over the front end of the planning period.

There is also a risk that current water losses cannot be reduced from an estimated 28.2% of direct consumption to 20% in 2040. If this cannot be achieved, or if losses worsen, then residential water requirements could be at least 4 million m^3/a higher than the base case projection for 2040.

Irrigation requirements are **not** included in the projection above.

[31] Excluding agriculture

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Appendix A

Population projections per catchment

Table A.1 Population projections for Lephalala

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Zwartwater	160	160	1.00	160	1	160	LSP
Tom Burke	235	256	1.10	282	1.1	310	LSP
Sefetlhogo	2 475	2 453	0.99	2 428	0.98	2 380	4th order
Morwe	1 689	1 674	0.99	1 657	0.98	1 624	4th order
Botshabelo	1 430	1 405	0.98	1 376	0.97	1 335	5th order
Lebu	554	544	0.98	533	0.97	517	5th order
Moong	1 035	1 017	0.98	996	0.97	967	5th order
Mothlasedi	2 101	2 298	1.10	2 528	1.1	2 780	PCP
Ga-Seleka	8 159	8 924	1.10	9 816	1.1	10 798	PCP
Kauletsi	2 321	2 300	0.99	2 277	0.98	2 232	4th order
Magadimela	226	222	0.98	218	0.97	211	5th order
Tshelamfake	395	388	0.98	380	0.97	369	5th order
Letlora	1 329	1 305	0.98	1 279	0.97	1 241	5th order
Kgobagadimo	1 701	1 686	0.99	1 669	0.98	1 636	4th order
Khopanong	1 011	993	0.98	973	0.97	944	5th order
Botsalanong	1 489	1 476	0.99	1 461	0.98	1 432	4th order
Segale	453	445	0.98	436	0.97	423	5th order
Ga-Mocheko	881	865	0.98	848	0.97	823	5th order
Lepurupurung	1 002	1 096	1.10	1 205	1.1	1 326	LSP
Thabo Mbeki	4 430	5 294	1.22	6 459	1.22	7 880	LSP
Tlapa le Borethe	506	497	0.98	487	0.97	472	5th order
Senoela	1 059	1 040	0.98	1 020	0.97	989	5th order
Mongalo	881	865	0.98	848	0.97	823	5th order
Reabetswe	1 026	1 007	0.98	987	0.97	958	5th order
Hlagalakwena	838	823	0.98	806	0.97	782	5th order
Mmaletswai	1 743	1 727	0.99	1 710	0.98	1 676	4th order
Ditaung	592	582	0.98	570	0.97	553	5th order
Mokuruanyane Martinique	1 277	1 266	0.99	1 253	0.98	1 228	4th order
Mokuruanyane Neckar	936	928	0.99	918	0.98	900	4th order
Mokuruanyane Abbottspoort	4 256	4 217	0.99	4 175	0.98	4 092	4th order
Kiti	838	823	0.98	806	0.97	782	5th order
Keletse le mma	1 175	1 154	0.98	1 131	0.97	1 097	5th order
Dipompopong	814	799	0.98	783	0.97	760	5th order
Motsweding	1 035	1 017	0.98	996	0.97	967	5th order
Ga-Maeteletsa	1 256	1 245	0.99	1 233	0.98	1 208	4th order
Bangalong	934	917	0.98	899	0.97	872	5th order
Ga-Monyeki	4 027	4 405	1.10	4 845	1.1	5 330	PCP
Setateng	9 387	10 266	1.10	11 293	1.1	12 422	PCP
Total	**65 658**	**68 379**	**0.49**	**71 745**	**0.49**	**75 296**	

Table A.2 Population projections for Mokolo

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Lephalale	21 385	27 066	1.28	34 645	1.28	44 346	PGP
Marapong	26 227	30 425	1.16	35 293	1.16	40 940	PGP
Marapong Squatter	1 091	1 412	1.30	1 836	1.30	2 386	PGP
Mabatlane	14 426	14 426	1.00	14 426	1.00	14 426	MGP
Mabatlane Squatter	2 202	2 202	1.00	2 202	1.00	2 202	MGP
Mabaleng	1 844	1 844	1.00	1 844	1.00	1 844	LSP
Mabaleng Squatter	1 062	1 062	1.00	1 062	1.00	1 062	LSP
Total	**68 238**	**78 438**	**1.16**	**91 308**	**1.17**	**107 206**	

Table A.3 Population projections for Mogalakwena

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Alldays	3 031	3 470	1.20	4 164	1.20	4 996	MGP
Taaiboschgroet	6 240	6 396	1.05	6 716	1.05	7 052	LSP
Juniorsloop	698	685	0.98	672	0.98	658	4th order
Royston	979	961	0.98	942	0.98	923	4th order
Voorhout	503	494	0.98	484	0.98	474	5th order
Donkerhoek	679	667	0.98	654	0.98	641	5th order
Longden	1 892	1 858	0.98	1 821	0.98	1784	4th order
Grootpan	2 427	2 384	0.98	2 336	0.98	2 289	4th order
Simpson	1 839	1 806	0.98	1 770	0.98	1 734	4th order
Sais	1 172	1 151	0.98	1 128	0.98	1 105	4th order
Slaaphoek	948	931	0.98	912	0.98	894	4th order
Thlonasedimong	1 523	1 593	1.051	1 674	1.051	1 759	MGP
Ga-Raphokola	3 779	3 779	1.00	3 779	1.00	3 779	PCP
Wegdraai	2 063	2 026	0.98	1 985	0.98	1 946	4th order
Berseba	406	398	0.98	390	0.98	383	5th order
Gideon	917	901	0.98	883	0.98	865	5th order
Eldorado	2 377	2 485	1.051	2 612	1.051	2 745	MGP
Esaurinca	1 843	1 810	0.98	1 774	0.98	1 739	4th order
Fonteine Du Champ	538	528	0.98	518	0.98	507	5th order
Louisenthal	966	948	0.98	929	0.98	911	5th order
Pax	2 063	2 026	0.98	1 985	0.98	1 946	4th order
Johannesburg	146	143	0.98	140	0.98	137	5th order
De Vrede	3 201	3 201	1.00	3 201	1.00	3 201	PCP
Kromhoek	6 103	6 103	1.00	6 103	1.00	6 103	PCP
Thorp	794	780	0.98	764	0.98	749	5th order
Archibald	604	593	0.98	581	0.98	570	5th order
Genua	481	472	0.98	463	0.98	453	5th order
Letswatla	2704	2 655	0.98	2 602	0.98	2 550	4th order
Borwalathoto	1677	1 647	0.98	1 614	0.98	1 581	4th order
The Grange	503	494	0.98	484	0.98	474	5th order
The Glen	842	827	0.98	811	0.98	794	5th order
Burgerregt	2344	2 302	0.98	2 256	0.98	2 211	4th order
Lovely	256	251	0.98	246	0.98	241	5th order
Edwinsdale	1053	1 034	0.98	1 014	0.98	993	4th order
Glenferness	987	970	0.98	950	0.98	931	4th order
Ga-Mamoleka	1137	1 116	0.98	1 094	0.98	1 072	4th order
Berg-en-Dal	1374	1 349	0.98	1 322	0.98	1 296	4th order
Gorkum	2673	2 625	0.98	2 572	0.98	2 521	4th order
Varedig	697	684	0.98	671	0.98	657	5th order
Sekhung	1466	1 440	0.98	1 411	0.98	1 383	4th order
Papegaai	1189	1 168	0.98	1 145	0.98	1 122	4th order
Ga-Mankgodi	1358	1 334	0.98	1 307	0.98	1 281	5th order
Vergelegen	1483	1 457	0.98	1 428	0.98	1 399	4th order
Grootdraai	1198	1 177	0.98	1 153	0.98	1 130	4th order
Baltimore	51	51	1.00	51	1.00	51	LSP

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Mons	1224	1 203	0.98	1 179	0.98	1 155	4th order
Kirstenspruit	785	771	0.98	755	0.98	740	5th order
De La Roche	181	178	0.98	174	0.98	171	5th order
Swarts	714	702	0.98	688	0.98	674	5th order
Non-Parella	679	667	0.98	654	0.98	641	5th order
De Villiersdale	692	680	0.98	666	0.98	653	5th order
De Villiersdale 1	512	502	0.98	492	0.98	482	5th order
De Villiersdale 2	331	325	0.98	318	0.98	312	5th order
Silwermyn	557	547	0.98	536	0.98	526	4th order
Madibeng	886	870	0.98	853	0.98	836	5th order
Driekoppies	1098	1 078	0.98	1 057	0.98	1 036	5th order
Thabanantlhana	93	91	0.98	89	0.98	87	5th order
Mokudung	1290	1 267	0.98	1 242	0.98	1 217	4th order
Ga-Rawesi	887	871	0.98	853	0.98	836	4th order
Aurora	547	537	0.98	526	0.98	516	5th order
Mesehleng 1	780	767	0.98	751	0.98	736	5th order
Mesehleng 2	0	0	0.00	0	0.00	0	
Lekiting	401	394	0.98	386	0.98	378	5th order
Murasie	887	871	0.98	853	0.98	836	4th order
Ga-Letswalo	340	333	0.98	327	0.98	320	5th order
Kgokonyane	578	567	0.98	556	0.98	545	5th order
Nonono	384	377	0.98	369	0.98	362	5th order
Ga-Masekwa	326	320	0.98	314	0.98	308	5th order
Setlaole	163	160	0.98	157	0.98	154	5th order
Rotlokwa	437	429	0.98	420	0.98	412	5th order
Uitkyk 2	185	182	0.98	178	0.98	175	5th order
Ga-Ngwepe	1 233	1 211	0.98	1 187	0.98	1 163	4th order
Uitkyk 1	668	572	0.90	515	0.90	464	5th order
Ga-Mankgodi A	429	368	0.90	331	0.90	298	4th order
Ga-Mankgodi B	215	184	0.90	165	0.90	149	4th order
Ga-Motlakgomo	763	654	0.90	588	0.90	530	4th order
Mohlajeng	1 267	1 086	0.90	978	0.90	880	4th order
Ga-Mantlhodi	2 030	1 740	0.90	1 566	0.90	1 409	4th order
Rozenkranz	795	681	0.90	613	0.90	552	4th order
Ngwanallela	2 089	1 790	0.90	1 611	0.90	1 450	5th order
Pinkie	2 181	1 870	0.90	1 683	0.90	1 514	4th order
Leokaneng	1 752	1 502	0.90	1 352	0.90	1 216	4th order
Mamehlabe	2 149	1 842	0.90	1 658	0.90	1 492	4th order
Ga-Maribana	1 851	1 587	0.90	1 428	0.90	1 285	4th order
Ga-Mosehlong	1 164	998	0.90	898	0.90	808	4th order
Ga-Phagodi	1 645	1 410	0.90	1 269	0.90	1 142	4th order
Lehlohlong	2 149	1 842	0.90	1 658	0.90	1 492	4th order
Ga-Phago	2 455	2 104	0.90	1 894	0.90	1 705	4th order
Ga-Nonyane	1 647	1 647	1.00	1 647	1.00	1 647	PCP
Rapitsi	1 947	1 669	0.90	1 502	0.9	1 352	4th order
Ga-Ramotlokana	1 327	1 137	0.90	1 024	0.90	921	4th order
Ga-Mabitsela	1 585	1 359	0.90	1 223	0.90	1 101	4th order

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Ga-Mmabasotho	2 304	1 975	0.90	1 778	0.90	1 600	4th order
Ramatlwane	1 589	1 362	0.90	1 226	0.90	1 103	4th order
Ga-Modikana	1 534	1 314	0.90	1 183	0.90	1 065	4th order
Eerste geluk	34	29	0.90	26	0.90	24	5th order
Damplaats	749	642	0.90	578	0.90	520	5th order
Helena	191	164	0.90	148	0.90	133	5th order
Ga-Ngwetsana	2 139	2 139	1.00	2 139	1.00	2 139	PCP
Rampuru	1 489	1 773	1.22	2 164	1.22	2 640	MGP
Kgabo Park	1 114	1 326	1.22	1 618	1.22	1 973	MGP
Ga-Ramoshwane	1 404	1 672	1.22	2 040	1.22	2 489	MGP
Ga-Setshaba	1 390	1 192	0.90	1 073	0.90	965	4th order
Ga-Kgoroshi	846	725	0.90	653	0.90	588	4th order
Taung	1 144	981	0.90	883	0.90	794	4th order
Ga-Ramakadi-Kadi	3 341	2 864	0.90	2 577	0.90	2 320	4th order
Chloe A	479	476	1.22	580	1.22	708	MGP
Chloe B	481	412	0.90	371	0.90	334	5th order
Tibana	2 011	2 011	1.00	2 011	1.00	2 011	LSP
Ga-Phaka	1 557	1 335	0.90	1 201	0.90	1 081	4th order
Schoongelegen	1 545	1 325	0.90	1 192	0.90	1 073	4th order
Juno	1 418	1 216	0.90	1 094	0.90	985	4th order
Ga-Lepadima	1 466	1 257	0.90	1 131	0.90	1 018	4th order
Ga-Mokobodi	1 357	1 163	0.90	1 047	0.90	942	5th order
Nokayamatlala	2 372	2 033	0.90	1 830	0.90	1 647	4th order
Boratapelo	1 077	923	0.90	831	0.90	747	4th order
Moetagare	1 526	1 308	0.90	1 177	0.90	1 059	4th order
Goedgevonden	1 156	991	0.90	892	0.90	803	4th order
Hwibi	2 384	2 043	0.90	1 839	0.90	1 655	4th order
Mpone Ntlolane 1	806	691	0.90	622	0.90	560	4th order
Mpone Ntlolane 3	719	616	0.90	555	0.90	499	5th order
Ntlolane 2	1 851	1 587	0.90	1 428	0.90	1 285	4th order
Dibeng	2 364	2 364	1.00	2 364	1.00	2 364	PCP
Phofu	2 295	2 295	1.00	2 295	1.00	2 295	PCP
Waschbank	1 196	1 025	0.90	922	0.90	830	4th order
Ga-Ramakara	834	715	0.90	644	0.90	579	4th order
Maineleng	1 196	1 196	1.00	1 196	1.00	1 196	PCP
Bakone	3 483	3 483	1.00	3 483	1.00	3 483	PCP
Ga-Selolo	1 623	1 623	1.00	1 623	1.00	1 623	PCP
Semaneng	1 414	1 414	1.00	1 414	1.00	1 414	PCP
Manamela 2	1 627	1 627	1.00	1 627	1.00	1 627	PCP
Madietane	3 364	3 364	1.00	3 364	1.00	3 364	PCP
Phetole	2 209	2 209	1.00	2 209	1.00	2 209	PCP
Christiana	1 041	892	0.90	803	0.90	723	4th order
Vlaklaagte	1 041	892	0.90	803	0.90	723	4th order
Magongoa	1 800	1 543	0.90	1 388	0.90	1 250	4th order
Kaalspruit 1	957	820	0.90	738	0.90	664	5th order
Naledi	1 418	1 216	0.90	1 094	0.90	985	4th order
Venus	1 545	1 325	0.90	1 192	0.90	1 073	4th order

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Sefahlane	1 093	936	0.90	843	0.90	759	4th order
Sepanapudi	1 855	1 590	0.90	1 431	0.90	1 288	4th order
Waterplaats	455	390	0.90	351	0.90	316	5th order
Monotwane 1	1 267	1 086	0.90	978	0.90	880	4th order
Ga-Madiba	862	739	0.90	665	0.90	599	4th order
Monotwane 2	710	609	0.90	548	0.90	493	5th order
Mohlonong	1 212	1 039	0.90	935	0.90	841	4th order
Glen Roy	783	671	0.90	604	0.90	543	5th order
Diana	1 152	988	0.90	889	0.90	800	4th order
Jupiter	2 976	2 551	0.90	2 296	0.90	2 066	4th order
Manyapye	1 514	1 297	0.90	1 168	0.90	1 051	4th order
Utjane	1 549	1 549	1.00	1 549	1.00	1 549	PCP
Sebora	1 828	1 828	1.00	1 828	1.00	1 828	PCP
Matlaleng	193	193	1.00	193	1.00	193	PCP
Mandela Park	942	942	1.00	942	1.00	942	PCP
Maune	791	791	1.00	791	1.00	791	PCP
Moshate	832	832	1.00	832	1.00	832	PCP
Mapateng	1 606	1 606	1.00	1 606	1.00	1 606	PCP
Ngopane	492	492	1.00	492	1.00	492	PCP
Boetse	1 184	1 184	1.00	1 184	1.00	1 184	PCP
Ga-Kgasha	1 766	1 766	1.00	1 766	1.00	1 766	PCP
Ga-Matlapa	1 875	1 607	0.90	1 447	0.9	1 302	4th order
Breda	989	971	0.98	952	0.98	933	5th order
Duren	208	205	0.98	201	0.98	197	5th order
Monte Christo	907	891	0.98	873	0.98	856	5th order
Polen	1 429	1 404	0.98	1 376	0.98	1 348	4th order
Khala	454	446	0.98	437	0.98	428	5th order
Mattanau	405	397	0.98	389	0.98	382	5th order
Lennes	392	385	0.98	378	0.98	370	5th order
Preezburg	809	795	0.98	779	0.98	763	5th order
Sodoma	1 381	1 357	0.98	1 330	0.98	1 303	4th order
Setuphulane	1 285	1 262	0.98	1 237	0.98	1 212	4th order
Thabaleshoba	1 804	1 772	0.98	1 736	0.98	1 702	4th order
Tipeng	1 516	1 489	0.98	1 460	0.98	1 430	4th order
Galakwena	793	779	0.98	763	0.98	748	5th order
Sterkwater	1 155	1 134	0.98	1 111	0.98	1 089	4th order
Ga-Tlhako	1 582	1 554	0.98	1 522	0.98	1 492	4th order
Taueatswala	3 477	3 415	0.98	3 347	0.98	3 280	4th order
Rebone	4 321	4 721	1.10	5 193	1.1	5 713	MGP
Uitzicht	2 362	2 320	0.98	2 273	0.98	2 228	4th order
Vergenoeg	1 281	1 258	0.98	1 233	0.98	1 208	4th order
Galelia	817	803	0.98	787	0.98	771	5th order
Blinkwater	1 826	1 793	0.98	1 757	0.98	1 722	4th order
Makobe	1 673	1 643	0.98	1 611	0.98	1 578	4th order
Bavaria	1 760	1 729	0.98	1 694	0.98	1 660	4th order
Matjitjileng	1 538	1 511	0.98	1 480	0.98	1 451	4th order
Ga-Mushi	1 402	1 377	0.98	1 349	0.98	1 322	5th order

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Ga-Chere	850	835	0.98	818	0.98	802	5th order
Vianna	1 795	1 763	0.98	1 728	0.98	1 693	4th order
Rapadi	1 303	1 280	0.98	1 254	0.98	1 229	4th order
Ga-Monare	1 499	1 472	0.98	1 443	0.98	1 414	4th order
Senita	703	690	0.98	677	0.98	663	5th order
Dipere	772	759	0.98	743	0.98	729	5th order
Nkidikitlana	1 978	1 943	0.98	1 904	0.98	1 866	4th order
Marken	290	290	1.00	290	1.00	290	LSP
Uitspan	933	916	0.98	898	0.98	880	4th order
Skilpadskraal	1 403	1 378	0.98	1 350	0.98	1 323	4th order
Lesodi	2 815	2 765	0.98	2 709	0.98	2 655	4th order
Mamatlakala	2 044	2 007	0.98	1 967	0.98	1 928	4th order
Mathekga	732	719	0.98	704	0.98	690	5th order
Moshuka	535	526	0.98	515	0.98	505	5th order
Skrikfontein A	1 011	993	0.98	973	0.98	954	4th order
Skrikfontein B	384	377	0.98	370	0.98	362	5th order
Raadslid	1 142	1 121	0.98	1 099	0.98	1 077	4th order
Nelly	1 442	1 417	0.98	1 388	0.98	1 360	4th order
Wydhoek	1 469	1 442	0.98	1 413	0.98	1 385	4th order
Paulos	1 577	1 549	0.98	1 518	0.98	1 488	4th order
Malapila	826	811	0.98	795	0.98	779	5th order
Kromkloof	1 612	1 583	0.98	1 552	0.98	1 521	4th order
Segole 1	813	799	0.98	783	0.98	767	5th order
Segole 2	1 630	1 601	0.98	1 569	0.98	1 537	4th order
Grasvlei	1 983	1 947	0.98	1 908	0.98	1 870	4th order
Tiberius	1 848	1 815	0.98	1 778	0.98	1 743	4th order
Mphelelo	683	670	0.98	657	0.98	644	5th order
Kgopeng	372	365	0.98	358	0.98	351	5th order
Ramosesane	286	281	0.98	275	0.98	270	5th order
Diphichi	756	743	0.98	728	0.98	713	5th order
Matebeleng	632	621	0.98	608	0.98	596	4th order
Vlakfontein	396	389	0.98	382	0.98	374	5th order
Vlakfontein 2	155	153	0.98	149	0.98	146	5th order
Tennerif	2 440	2 397	0.98	2 349	0.98	2 302	4th order
Seirappes	1 429	1 404	0.98	1 376	0.98	1 348	4th order
Hlogoyanku	1 935	1 900	0.98	1 862	0.98	1 825	4th order
Lekhureng	2 501	2 456	0.98	2 407	0.98	2 359	4th order
Chipana	1 146	1 126	0.98	1 103	0.98	1 081	4th order
Ham 1	2 667	2 619	0.98	2 567	0.98	2 515	4th order
Claremont	535	526	0.98	515	0.98	505	5th order
Taolome	544	534	0.98	523	0.98	513	5th order
Good Hope East	155	153	0.98	149	0.98	146	5th order
Good Hope	384	377	0.98	370	0.98	362	5th order
Van Wykspan	634	622	0.98	610	0.98	598	5th order
Elensfontein	200	197	0.98	193	0.98	189	5th order
Pudiyakgopa	2 928	2 876	0.98	2 818	0.98	2 762	4th order
Marulaneng	4 294	4 696	1.10	5 166	1.10	5 683	PCP

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Galakwenastroom	1 617	1 588	0.98	1 556	0.98	1 525	4th order
Jakkalskuil	1 264	1 241	0.98	1 216	0.98	1 192	4th order
Bohwidi	1 582	1 554	0.98	1 522	0.98	1 492	4th order
Kabeane	1 111	1 091	0.98	1 069	0.98	1 048	4th order
Harmansdal	887	871	0.98	854	0.98	837	5th order
Mabula	309	304	0.98	298	0.98	292	4th order
Mabuladihlare 1	2 510	2 465	0.98	2 416	0.98	2 367	4th order
Lusaka Ngoru	593	582	0.98	570	0.98	559	5th order
Dikgokgopeng	662	650	0.98	637	0.98	625	5th order
Basterspad	924	907	0.98	889	0.98	871	5th order
Bakenberg Basogadi	279	306	1.10	336	1.10	370	MGP
Bakenberg Kwanaite	1 527	1 670	1.10	1 837	1.10	2 021	MGP
Bakenberg Matlaba	2 675	2 926	1.10	3 218	1.10	3 540	MGP
Bakenberg Mautjana	712	779	1.10	856	1.10	942	MGP
Bakenberg Mmotong	2 009	2 197	1.10	2 417	1.10	2 659	MGP
Bakenberg Mothwathwase	1 680	1 838	1.10	2 021	1.10	2 223	MGP
Malokongskop	1 037	1 019	0.98	998	0.98	978	4th order
Rooiwal	1 878	1 845	0.98	1 808	0.98	1 771	4th order
Ditlotswane	967	950	0.98	931	0.98	912	4th order
Sepharane	1 277	1 254	0.98	1 229	0.98	1 204	4th order
Kaditshwene	1 560	1 532	0.98	1 501	0.98	1 471	4th order
Leyden	3 434	3 372	0.98	3 305	0.98	3 239	4th order
Rantlakane	2 588	2 542	0.98	2 491	0.98	2 441	4th order
Makekeng	1 939	1 904	0.98	1 866	0.98	1 829	4th order
Millenium Park	1 233	1 211	0.98	1 187	0.98	1 163	4th order
Witrivier	2 310	2 268	0.98	2 223	0.98	2 178	4th order
Phafola	2 179	2 140	0.98	2 097	0.98	2 055	4th order
Sekuruwe	2 523	2 478	0.98	2 428	0.98	2 380	4th order
Mohlotlo Ga-Puka	2 310	2 268	0.98	2 223	0.98	2 178	4th order
Mohlotlo Ga-Sekhaolelo	2 423	2 379	0.98	2 332	0.98	2 285	4th order
Mabusela	1 508	1 481	0.98	1 451	0.98	1 422	4th order
Kwakwalata	564	554	0.98	543	0.98	532	5th order
Masoge	629	618	0.98	606	0.98	594	5th order
Mesopotania	2 022	1 986	0.98	1 946	0.98	1 907	4th order
Fothane	728	715	0.98	700	0.98	686	4th order
Matopa	1 163	1 143	0.98	1 120	0.98	1 097	4th order
Magope	617	606	0.98	594	0.98	582	5th order
Maala Parekisi	750	736	0.98	721	0.98	707	4th order
Ga-Tshaba	827	904	1.10	995	1.10	1 094	PCP
Skimming	2 676	2 628	0.98	2 575	0.98	2 524	4th order
Hans	2 331	2 290	0.98	2 244	0.98	2 199	4th order
Lelaka	290	285	0.98	279	0.98	274	5th order
Seema	519	510	0.98	500	0.98	490	5th order
Ga-Chokoe	826	811	0.98	795	0.98	779	5th order
Matlou	2 232	2 232	1.00	2 232	1.00	2 232	LSP
Masahleng	1 486	1 459	0.98	1 430	0.98	1 402	4th order

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Danisane	2 946	2 893	0.98	2 835	0.98	2 778	4th order
Masenya	723	710	0.98	696	0.98	682	4th order
Ga-Molekana	4 589	5 019	1.10	5 521	1.10	6 073	PCP
Machikiri	1 469	1 442	0.98	1 413	0.98	1 385	4th order
Ga-Mokaba	2 314	2 272	0.98	2 227	0.98	2 182	4th order
Mmalepeteke	3 111	3 056	0.98	2 995	0.98	2 935	4th order
Sekgoboko	3 795	3 728	0.98	3 653	0.98	3 580	4th order
Ramorulane	1 121	1 226	1.10	1 349	1.10	1 484	PCP
Mabuela	2 510	2 465	0.98	2 416	0.98	2 367	4th order
Mmahlogo	1 010	1 105	1.10	1 216	1.10	1 337	PCP
Ga-Pila Sterkwater	4 122	4049	0.98	3 968	0.98	3 888	4th order
Tshamahansi	14 153	13 900	0.98	13 622	0.98	13 350	4th order
Ga-Magongoa	1 917	1 883	0.98	1 845	0.98	1 808	4th order
Kgobudi	4 732	4 648	0.98	4 555	0.98	4 464	4th order
Masodi	9 722	9 548	0.98	9 357	0.98	9 170	4th order
Masehlaneng	3 909	3 839	0.98	3 762	0.98	3 687	4th order
Maruteng	5 412	6 186	1.16	7 176	1.16	8 324	PGP
Moshate	5 469	6 385	1.16	7 407	1.16	8 592	PGP
Madiba	8 375	8 309	0.98	8 142	0.98	7 979	4th order
Mahwelereng	31 329	36 577	1.16	42 429	1.16	49 218	PGP
Mokopane	35 291	41 202	1.16	47 795	1.16	55 442	PGP
Makapans Valley	204	201	0.98	197	0.98	193	5th order
Makapans Valley Scattered	294	289	0.98	283	0.98	278	5th order
Sekgakgapeng	9 434	11 014	1.16	12 777	1.16	14 821	PGP
Mookgophong	6 394	7 465	1.16	8 659	1.16	10 045	PGP
Mookgophong Naboomspruit	7 829	9 140	1.16	10 603	1.16	12 299	PGP
Mookgophong Phomolong	9 180	10 718	1.16	12 433	1.16	14 422	PGP
Phomolong Squatter	3 312	3 866	1.16	4 485	1.16	5 203	PGP
Phagameng	36 851	40 536	1.00	40 536	1.00	40 536	PGP
Modimolle	8 468	8 891	1.00	8 891	1.00	8 891	PGP
Total	**606 499**	**616 303**	**1.02**	**629 958**	**1.03**	**648 549**	

Table A.4 Population projections for Nzhelele

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Sigonde	641	670	1.05	703	1.05	739	3rd & 4th
Gundu West	112	117	1.05	123	1.05	129	3rd & 4th
Bale North	237	248	1.05	260	1.05	273	3rd & 4th
Tshenzhelani Tsha Fhasi	125	130	1.05	137	1.05	144	3rd & 4th
Bale	1 098	1148	1.05	1 206	1.05	1 266	3rd & 4th
Lwathuda	832	870	1.05	913	1.05	959	3rd & 4th
Mataula	1 477	1 544	1.05	1 621	1.05	1 703	3rd & 4th
Mapakoni	774	809	1.05	850	1.05	892	3rd & 4th
Zwigodini Madipa	121	126	1.05	132	1.05	139	3rd & 4th
Matshena	1 281	1 340	1.05	1 407	1.05	1 477	3rd & 4th
Masea	919	961	1.05	1 009	1.05	1 060	3rd & 4th
Tshiungani	1 206	1 261	1.05	1 325	1.05	1 391	3rd & 4th
Muswodi Dipeni	2 296	2 401	1.05	2 521	1.05	2 647	3rd & 4th
Muswodi Tshisimani	2 043	2 136	1.05	2 243	1.05	2 355	3rd & 4th
Folovhodwe	4 139	4 503	1.05	4 728	1.05	4 965	PCP
Gumela	462	483	1.05	507	1.05	532	3rd & 4th
Musunda	370	387	1.05	407	1.05	427	3rd & 4th
Tshitanzhe	300	313	1.05	329	1.05	345	3rd & 4th
Helula	166	174	1.05	183	1.05	192	3rd & 4th
Ha-Mabila	458	478	1.05	502	1.05	528	3rd & 4th
Ngalavhani	395	413	1.05	434	1.05	456	3rd & 4th
Mufulwi	749	783	1.05	822	1.05	863	3rd & 4th
Tshikotoni	129	135	1.05	142	1.05	149	3rd & 4th
Mafhohoni	62	65	1.05	69	1.05	72	3rd & 4th
Tshilovi	62	65	1.05	69	1.05	72	3rd & 4th
Tsaanda 2	424	444	1.05	466	1.05	489	3rd & 4th
Dzumbama	250	261	1.05	274	1.05	288	3rd & 4th
Tshitandani	329	344	1.05	361	1.05	379	3rd & 4th
Mafhohoni	162	170	1.05	178	1.05	187	3rd & 4th
Mafhohoni South	75	78	1.05	82	1.05	86	3rd & 4th
Tshumulungwi	678	709	1.05	744	1.05	782	3rd & 4th
Mavhode	820	857	1.05	900	1.05	945	3rd & 4th
Madatshitshi	478	500	1.05	525	1.05	552	3rd & 4th
Goma	71	74	1.05	78	1.05	82	3rd & 4th
Gombani	312	326	1.05	343	1.05	360	3rd & 4th
Fefe	495	518	1.05	544	1.05	571	3rd & 4th
Mavhuwa	395	413	1.05	434	1.05	456	3rd & 4th
Gogogo	790	826	1.05	868	1.05	911	3rd & 4th
Madzororo	58	61	1.05	64	1.05	67	3rd & 4th
Mufongodi	100	104	1.05	110	1.05	115	3rd & 4th

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Matshavhawe 2	241	252	1.05	265	1.05	278	3rd & 4th
Tshixwadza	495	518	1.05	544	1.05	571	3rd & 4th
Luheni	1 240	1 296	1.05	1 361	1.05	1 429	3rd & 4th
Mangwele	270	283	1.05	297	1.05	312	3rd & 4th
Dzamba Tshiwisa	200	209	1.05	219	1.05	230	3rd & 4th
Mazwimba	121	126	1.05	132	1.05	139	3rd & 4th
Khakhu Thondoni	1 186	1 240	1.05	1 302	1.05	1 367	3rd & 4th
Mphagane	844	883	1.05	927	1.05	974	3rd & 4th
Makuleni	1 593	1 666	1.05	1 749	1.05	1 837	3rd & 4th
Tshifume	670	700	1.05	735	1.05	772	3rd & 4th
Sheshe	882	922	1.05	968	1.05	1 017	3rd & 4th
Maname	308	305	0.99	302	0.99	299	3rd & 4th
Thononda	1 927	1 909	0.99	1 890	0.99	1 871	3rd & 4th
Thonoda Lusidzana	256	253	0.99	251	0.99	248	3rd & 4th
Tshithuthuni	1 890	1 873	0.99	1 854	0.99	1 836	3rd & 4th
Lutomboni	515	510	0.99	505	0.99	500	3rd & 4th
Mudunungu	1 760	1745	0.99	1 727	0.99	1 710	3rd & 4th
Tshisinisa	150	149	0.99	147	0.99	146	3rd & 4th
Mandala A	544	539	0.99	533	0.99	528	3rd & 4th
Tshatharu	953	945	0.99	935	0.99	926	3rd & 4th
Musanda Thondoni	105	105	0.99	103	0.99	102	3rd & 4th
Mandala Tshantha	2 138	2 118	0.99	2 097	0.99	2 076	3rd & 4th
Tshikombani	1 420	1 407	0.99	1 393	0.99	1 379	3rd & 4th
Mbadoni	28	28	0.99	28	0.99	28	3rd & 4th
Malamba	158	157	0.99	155	0.99	154	3rd & 4th
Tshiheni	1 310	1 298	0.99	1 285	0.99	1 272	3rd & 4th
Ha-Matshareni	211	209	0.99	207	0.99	205	3rd & 4th
Dopeni	6 741	6 681	0.99	6 614	0.99	6 548	3rd & 4th
Shanzha	1 509	1 495	0.99	1 480	0.99	1 466	3rd & 4th
Tshivhilidulu	807	800	0.99	792	0.99	784	3rd & 4th
Makhavhani	2 036	2 018	0.99	1 998	0.99	1 978	3rd & 4th
Musanda Thondoni	65	64	0.99	64	0.99	63	3rd & 4th
Mandala B	657	651	0.99	645	0.99	638	3rd & 4th
Makanga	519	515	0.99	509	0.99	504	3rd & 4th
Domboni	191	189	0.99	187	0.99	185	3rd & 4th
Tshivhambe	262	287	1.10	315	1.10	347	1st
Matserere	1 622	1 608	0.99	1 592	0.99	1 576	3rd & 4th
Tshikhalani	162	161	0.99	159	0.99	158	3rd & 4th
Tshifhedzakhanga	211	209	0.99	207	0.99	205	3rd & 4th
Mutavhani	280	277	0.99	275	0.99	272	3rd & 4th
Thondoni	349	346	0.99	342	0.99	339	3rd & 4th
Khalavha	446	442	0.99	438	0.99	433	3rd & 4th

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Malale	3 331	3 966	1.22	4 839	1.22	5 904	3rd & 4th
Matshakatini	3 175	3 780	1.22	4 612	1.22	5 626	3rd & 4th
Ngonavhanyai	331	325	0.98	319	0.98	312	3rd & 4th
Garasite	286	280	0.98	275	0.98	269	3rd & 4th
Khomela	757	744	0.98	729	0.98	714	3rd & 4th
Phembani	472	463	0.98	454	0.98	445	3rd & 4th
Ndouvhada	406	398	0.98	390	0.98	383	3rd & 4th
Dolidoli	488	480	0.98	470	0.98	461	3rd & 4th
Natalie	112	110	0.98	108	0.98	105	3rd & 4th
Sane	501	492	0.98	482	0.98	472	3rd & 4th
Tshitwi	128	126	0.98	123	0.98	121	3rd & 4th
Afton	219	215	0.98	211	0.98	207	3rd & 4th
Straighthardt	940	923	0.98	904	0.98	886	3rd & 4th
Maranikhwe	435	427	0.98	418	0.98	410	3rd & 4th
Musekwa Korporasi	325	325	1.00	325	1.00	325	LSP
Musekwa	637	626	0.98	614	0.98	601	3rd & 4th
Pfumembe Tsha Fhasi	186	183	0.98	179	0.98	176	3rd & 4th
Pfumembe	865	850	0.98	833	0.98	816	3rd & 4th
Makushu	1 515	1 488	0.98	1 458	0.98	1 429	3rd & 4th
Maangani	857	841	0.98	825	0.98	808	3rd & 4th
Mamuhohi	558	583	1.05	613	1.05	643	PCP
Mudimeli	3 224	3 167	0.98	3 103	0.98	3 041	3rd & 4th
Mamvuka	3 191	3 134	0.98	3 072	0.98	3 010	3rd & 4th
Manyii	1 484	1 484	1.00	1 484	1.00	1 484	LSP
Matsa A	2 939	2 886	0.98	2 829	0.98	2 772	3rd & 4th
Maname Paradise	2 239	2 199	0.98	2155	0.98	2 112	3rd & 4th
Tshikuwi	5 156	5 156	1.00	5 156	1.00	5 156	LSP
Matsa B	807	793	0.98	777	0.98	761	3rd & 4th
Ha Matsa	878	862	0.98	845	0.98	828	3rd & 4th
Tshirolwe Ext 2	1507	1480	0.98	1450	0.98	1421	3rd & 4th
Tshirolwe Ext1	1 068	1 049	0.98	1 028	0.98	1 007	3rd & 4th
Tshituni	357	374	1.05	392	1.05	412	PCP
Dzanani	2 572	2 690	1.05	2 824	1.05	2 965	MGP
Makhado	20 954	24 950	1.20	29 940	1.20	35 928	PGP
Tshituni B	1 116	1167	1.05	1 225	1.05	1 287	PCP
Siyawoadza	185	193	1.05	203	1.05	213	PCP
Ha-Mapila	835	873	1.05	917	1.05	963	PCP
Mapakophele	542	567	1.05	595	1.05	625	PCP
Tshithuni Tshafhasi	1 325	1 385	1.05	1 454	1.05	1 527	PCP
Tshituni Tshantha	3 304	3 455	1.05	3 627	1.05	3 809	PCP
Thembaluvhilo	4 946	5 172	1.05	5 430	1.05	5 702	PCP
Ha-Matidza	3 312	3 463	1.05	3 636	1.05	3 818	PCP

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Ramavhoya	707	739	1.05	776	1.05	815	PCP
Ha-Rabali |(& ward 38)	3 064	3 203	1.05	3 364	1.05	3 532	MGP
Ha-Maphaha (& ward 38)	4 893	5 116	1.05	5 372	1.05	5 640	MGP
Matanda Zone 2	706	738	1.05	775	1.05	814	MGP
Mamuhoyi	1 780	1 861	1.05	1 954	1.05	2 051	MGP
Mandiwana	1 247	1 304	1.05	1 369	1.05	1 437	MGP
Divhani	1 381	1 444	1.05	1 516	1.05	1 592	PCP
Mavhunga	2 706	2 829	1.05	2 971	1.05	3 119	PCP
Tshiswenda	446	466	1.05	489	1.05	514	PCP
Tshilimbane	50	49	0.98	48	0.98	47	3rd & 4th
Tshiendeulu	948	931	0.98	912	0.98	894	3rd & 4th
Dzata Ruins	124	122	0.98	120	0.98	117	3rd & 4th
Magoloni	173	181	1.05	190	1.05	200	MGP
Tshikhudo	900	941	1.05	988	1.05	1 038	MGP
Dzanani	2 572	2 690	1.05	2 824	1.05	2 965	MGP
Ha-Manngo	2 172	2 271	1.05	2 384	1.05	2 504	MGP
Tshavhalovhedzi	3 472	3 631	1.05	3 812	1.05	4 003	MGP
Siloam	1 829	1 913	1.05	2 008	1.05	2 109	MGP
Ha-Mphaila	908	950	1.05	997	1.05	1 047	MGP
Ha-Funyufunyu	2 779	2 906	1.05	3 051	1.05	3 203	MGP
Makungwi	931	974	1.05	1 023	1.05	1 074	PCP
Mauluma	3 099	3 241	1.05	3 403	1.05	3 573	PCP
Raliphaswa	3 400	3 555	1.05	3 733	1.05	3 920	MGP
Khunda	195	191	0.98	187	0.98	183	3rd & 4th
Manyuwa	91	89	0.98	88	0.98	86	3rd & 4th
Dzumbathoho	1 457	1 524	1.05	1 600	1.05	1 680	PCP
Phadzima	679	667	0.98	653	0.98	640	3rd & 4th
Mazuwa	919	961	1.05	1 009	1.05	1 060	PCP
Tshitavha	1 718	1 687	0.98	1 653	0.98	1 620	3rd & 4th
Tshedza	1 819	1 902	1.05	1 997	1.05	2 096	PCP
Matshavhawe	915	898	0.98	880	0.98	863	3rd & 4th
Piesanghoek	1 006	988	0.98	968	0.98	949	3rd & 4th
Gudumabama	1 507	1 480	0.98	1 450	0.98	1 421	3rd & 4th
Maelula	1 252	1 310	1.05	1 375	1.05	1 444	PCP
Maelula	803	840	1.05	882	1.05	926	PCP
Murunwa	2 192	2 292	1.05	2 407	1.05	2 527	PCP
Matakani	666	697	1.05	732	1.05	768	PCP
Vuvha	2 893	2 842	0.98	2 785	0.98	2 729	3rd & 4th
Total	**200 027**	**209 180**	**1.05**	**220 210**	**1.06**	**232 897**	

Table A.5 Population projections for Sand River

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Musina	9 966	14 051	1.30	18 267	1.30	23 747	1st order
Harper	0	0	0.00	0	0.00	0	1st order
Lost City (Campbell)	604	851	1.30	1 106	1.30	1 438	1st order
Musina Military Base	190	268	1.30	348	1.30	452	1st order
Nancefield	32 007	46 873	1.30	60 935	1.30	79 215	1st order
Mopane	207	486	1.30	632	1.30	821	3rd & 4th
Makhado	20 954	24 950	1.20	29 940	1.20	35 928	PGP
Tshikota	7 396	8 806	1.20	10 567	1.20	12 680	PGP
Tshikota Squatter	79	94	1.20	113	1.20	136	PGP
Alexandra	186	183	0.98	179	0.98	176	3rd & 4th
Muraleni Block B	368	362	0.98	355	0.98	347	3rd & 4th
Muraleni Block C	1 834	1 801	0.98	1 765	0.98	1 730	3rd & 4th
Midoroni	3 268	3 417	1.05	3 588	1.05	3 767	PCP
Tshikhodobo	1 100	1 150	1.05	1 208	1.05	1 268	PCP
Dzumbathoho	1 457	1 524	1.05	1 600	1.05	1 680	MGP
Tshikwarane	1 726	1 805	1.05	1 895	1.05	1 990	PCP
Zamenkom	1 921	1 886	0.98	1 848	0.98	1 812	3rd & 4th
Ha-Manavhela	1 273	1 331	1.05	1 397	1.05	1 467	PCP
Raphulu	831	869	1.05	912	1.05	958	PCP
Thembaluvhilo	935	978	1.05	1 027	1.05	1 078	PCP
Muduluni	1 244	1 301	1.05	1 366	1.05	1 435	PCP
Maebane	3 978	4 160	1.05	4 368	1.05	4 586	PCP
Makhitha	741	728	0.98	713	0.98	699	3rd & 4th
Dzumbathoho	1 429	1 494	1.05	1 569	1.05	1 648	PCP
Madaheni	1 490	1 463	0.98	1 434	0.98	1 405	3rd & 4th
Diiteleni	17	16	0.98	16	0.98	16	3rd & 4th
Diiteleni	2 397	2 506	1.05	2 631	1.05	2 763	PCP
Ha-Madodonga	1 126	1 106	0.98	1 084	0.98	1 062	3rd & 4th
Lufukula	1 784	1 752	0.98	1 717	0.98	1 683	3rd & 4th
Buysdorp	1 191	1 191	1.00	1 191	1.00	1 191	LSP
Thalane	146	146	1.00	146	1.00	146	LSP
Madabani	2 587	2 541	0.98	2 490	0.98	2 440	3rd & 4th
Ha-Mamburu	439	431	0.98	422	0.98	414	3rd & 4th
Ravele	5 219	5 457	1.05	5 730	1.05	6 016	PCP
Gogobole	5 311	5 554	1.05	5 831	1.05	6 123	PCP
Ramahantsha	3 400	3 555	1.05	3 733	1.05	3 920	PCP
Tshiozwi	4 079	4 265	1.05	4 478	1.05	4 702	PCP
Madombidza Zone 1	1 829	1 913	1.05	2 008	1.05	2 109	MGP
Madombidzha Zone 2	3 006	3 143	1.05	3 300	1.05	3 465	MGP
Madombidzha Zone 3	9 996	10 452	1.05	10 975	1.05	11 524	MGP
Rathidili	2 114	2 210	1.05	2 321	1.05	2437	MGP
Ha-Magau	2 541	2 496	0.98	2 446	0.98	2397	3rd & 4th
Raliphaswa	699	730	1.05	767	1.05	805	MGP
Mutavhanoni	892	933	1.05	979	1.05	1028	MGP
Makhado Air Force	1 055	1 037	0.98	1 016	0.98	996	3rd & 4th

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Base							
Bandelierkop	75	73	0.98	72	0.98	70	3rd & 4th
Vivo	59	59	1.00	59	1.00	59	LSP
Indermark	10 624	10 624	1.00	10 624	1.00	10624	LSP
Ga-Kibi	560	550	0.98	539	0.98	528	5th order
The Grange	503	494	0.98	484	0.98	474	5th order
The Glen	842	827	0.98	811	0.98	794	5th order
Burgerregt	2 344	2 302	0.98	2 256	0.98	2211	4th order
Glenferness	987	970	0.98	950	0.98	931	4th order
Edwinsdale	1 053	1 034	0.98	1 014	0.98	993	4th order
Lovely	256	251	0.98	246	0.98	241	5th order
Avon	9 365	10 233	1.10	11 256	1.10	12382	MGP
Bul Bul	366	359	0.98	352	0.98	345	5th order
Sewale North	57	56	0.98	55	0.98	54	5th order
Sewale South	1 340	1 340	1.00	1 340	1.00	1340	PCP
Dantzig 1	3 402	3 402	1.00	3 402	1.00	3402	PCP
Dantzig 2	4	4	0.98	4	0.98	4	5th order
Blouberg	3 481	3 481	1.00	3 481	1.00	3481	PCP
Ga-Tshabalala	1 515	1 515	1.00	1 515	1.00	1515	PCP
Thalahane	2 561	2 561	1.00	2 561	1.00	2561	PCP
Ga-Mamohwibidu	1 887	1 887	1.00	1 887	1.00	1887	PCP
Kwaring	1 935	1 935	1.00	1 935	1.00	1935	PCP
Brodie Hill	2 440	2 397	0.98	2 349	0.98	2302	4th order
Ga-Mampote	939	922	0.98	904	0.98	886	5th order
Kgatalala	216	212	0.98	208	0.98	204	5th order
Sesalong	368	368	1.00	368	1.00	368	PCP
Kutumpa	1 817	1 817	1.00	1 817	1.00	1817	PCP
Ga-Malokela	1 935	1 935	1.00	1 935	1.00	1935	PCP
Kobe	4 934	4 934	1.00	4 934	1.00	4934	PCP
Sebotlana	1 045	1 026	0.98	1 005	0.98	985	4th order
Nieuwe Jerusalem	110	108	0.98	106	0.98	104	5th order
Ga-Ntshireletsa	388	381	0.98	373	0.98	366	5th order
Ga-Hlako	1 874	1 840	0.98	1 804	0.98	1768	4th order
Bodie	3 296	3 237	0.98	3 172	0.98	3109	4th order
Dithabaneng	556	546	0.98	535	0.98	524	5th order
Mongalo	1 221	1 200	0.98	1 176	0.98	1152	5th order
Udney 1	397	390	0.98	382	0.98	374	5th order
Ga-Motshemi	1 019	1 000	0.98	980	0.98	961	5th order
Ga-Mmatemana	1 128	1 108	0.98	1 086	0.98	1064	4th order
Mophamamana	908	892	0.98	874	0.98	857	4th order
Ditatsu	1 120	1 100	0.98	1 078	0.98	1 056	5th order
Ga-Rammutla 2	485	0	0.98	0	0.98	0	5th order
Schroelen 2	238	234	0.98	229	0.98	225	5th order
Ga-Mamolele	463	455	0.98	446	0.98	437	5th order
Ga-Mashalane	926	909	0.98	891	0.98	873	4th order
Matshira	775	775	1.00	775	1.00	775	PCP
Pickum 1	263	263	1.00	263	1.00	263	PCP

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Pickum 2	1 054	1 035	0.998	1 033	0.998	1 031	5th order
Tswatsane	675	663	0.998	661	0.998	660	5th order
Ga-Rammutla 1	948	931	0.998	929	0.998	927	5th order
Ga-Tefu	472	463	0.998	462	0.998	462	5th order
Schroelen	84	82	0.998	82	0.998	82	5th order
Puraspan	3 885	4 062	1.05	4 265	1.05	4 478	MGP
Dalmeny	35	35	0.998	35	0.998	35	5th order
Bochem	494	485	0.998	484	0.998	483	5th order
Bochem North	1 577	0	1.10	0	1.10	0	MGP
Bochum	2 932	3 491	1.20	4 189	1.20	5 027	MGP
Witten	5 017	5 247	1.05	5 509	1.05	5 784	MGP
Cumbrae (Senwabarwana)	5 802	6 908	1.20	8 290	1.20	9 948	MGP
Borkum	66	65	0.98	64	0.98	62	5th order
Werden	97	95	0.98	93	0.98	92	5th order
Ga-Maselela	1 856	1 823	0.98	1 787	0.98	1 751	4th order
Ga-Maboth	3 063	3 009	0.98	2 948	0.98	2 889	4th order
Schoongezicht	626	615	0.98	603	0.98	591	5th order
Ga-Mabeba	692	680	0.98	666	0.98	653	5th order
Mokumuru	811	797	0.98	781	0.98	765	5th order
Gamakgwata	101	100	0.98	98	0.98	96	5th order
Ga-Mokopane	821	806	0.98	790	0.98	774	4th order
Manye	1 071	1 052	0.98	1 031	0.98	1 010	4th order
Brilliant	503	485	0.96	466	0.96	447	5th order
Manyelo	60	58	0.96	56	0.96	53	5th order
Schoonveld 2	188	181	0.96	174	0.96	167	5th order
Schoonveld 1	507	489	0.96	469	0.96	450	5th order
Sakoleng	661	637	0.96	612	0.96	587	5th order
Reinland	165	159	0.96	153	0.96	147	5th order
Ga-Sako	623	601	0.96	577	0.96	554	5th order
Ga-Kgare	559	539	0.96	518	0.96	497	5th order
Brussels	977	942	0.96	904	0.96	868	4th order
Bouwlust	511	492	0.96	473	0.96	454	5th order
Ga-Mokgehle	529	511	0.96	490	0.96	471	5th order
Koekoek	526	507	0.96	487	0.96	467	5th order
Schellenberg A	94	91	0.96	87	0.96	83	5th order
Schellenberg B	222	214	0.96	205	0.96	197	5th order
Ga-Moleele	676	652	0.96	626	0.96	601	5th order
Ga-Poopedi	375	362	0.96	348	0.96	334	5th order
Ga-Broekmane	1 643	1 585	0.96	1 521	0.96	1461	4th order
Koniggratz	4 459	4 459	1.00	4 459	1.00	4459	PCP
Mohodi	2 780	2 780	1.00	2 780	1.00	2780	PCP
Fatima	3 704	3 704	1.00	3 704	1.00	3704	PCP
Wurthsdorp	8 982	8 982	1.00	8 982	1.00	8982	PCP
Ga-Madikana	4 269	4 269	1.00	4 269	1.00	4269	PCP
Mogwadi	2 494	2 725	1.10	2 997	1.10	3297	DGP
Makgalong A	267	257	0.96	247	0.96	237	5th order

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Makgalong B	184	177	0.96	170	0.96	164	5th order
Makgato	3 647	3 517	0.96	3 376	0.96	3241	4th order
Sekakene	3 758	3 625	0.96	3 480	0.96	3340	4th order
Mangata	1 897	1 897	1.00	1 897	1.00	1897	PCP
Matseke	5 189	5 426	1.05	5 697	1.05	5982	MGP
Mphakane	20 669	21 613	1.05	22 693	1.05	23828	MGP
Ga-Phasha	1 457	1 405	0.96	1 349	0.96	1295	4th order
Ramakgopa	18 413	18 413	1.00	18 413	1.00	18413	PCP
Ramatshowe	2 740	2 740	1.00	2 740	1.00	2740	PCP
Mokganya	65	65	1.00	65	1.00	65	PCP
Eisleben	5 933	5 827	0.98	5 711	0.98	5596	LSP
Nthabiseng	3 026	3 306	1.10	3 637	1.10	4000	DGP
Capricorn Park LCH	2 081	2 274	1.10	2 501	1.10	2751	DGP
Morebeng	387	423	1.10	465	1.10	512	DGP
Terbrugge A	385	330	0.90	297	0.90	268	4th order
Terbrugge B	238	204	0.90	184	0.90	165	4th order
Mohlajeng	1 267	1 086	0.90	978	0.90	880	4th order
Kanana	1 760	1 509	0.90	1 358	0.90	1222	4th order
Ga-Moropa	1 093	936	0.90	843	0.90	759	4th order
Sekuruwe 2	396	339	0.90	305	0.90	275	5th order
Ga-Kolopo	1 367	1 171	0.90	1 054	0.90	949	4th order
Ga-Maribana	1 851	1 587	0.90	1 428	0.90	1285	4th order
Modderput	94	80	0.90	72	0.90	65	5th order
Marowe	3 309	2 837	0.90	2 553	0.90	2298	4th order
Vischkuil	574	492	0.90	443	0.90	399	5th order
Kaalspruit 1	957	820	0.90	738	0.90	664	5th order
Ga-Rankhuwe	2 014	1 726	0.90	1 554	0.90	1398	4th order
Ga-Piet	1 502	1 287	0.90	1 158	0.90	1043	4th order
Wachtkraal	1 541	1 321	0.90	1 189	0.90	1070	4th order
Manyapye	1 514	1 297	0.90	1 168	0.90	1051	4th order
Utjane	1 549	1 549	1.00	1 549	1.00	1549	PCP
Bergnek	1 171	1 136	0.96	1 091	0.96	1047	4th order
Leshikishiki	1 270	1 221	0.95	1 160	0.95	1102	5th order
Polokwane - Elmadal S/H	223	239	1.07	256	1.07	274	PCP
Thokgwaneng	5 553	5 945	1.07	6 361	1.07	6 806	LSP
Polokwane - Leeukuil S/H	2 288	2 449	1.07	2 621	1.07	2 804	PCP
Matobole	2 617	2 801	1.07	2 997	1.07	3 207	LSP
Sepanapudi	831	820	1.00	820	1.00	820	5th Order
Maratapelo	1 892	2 434	1.25	3 043	1.25	3 803	DGP
Dichueneng	621	608	0.97	590	0.97	572	4th order
Ga-Maja	1 377	1 350	0.97	1 309	0.97	1 270	4th order
Ga-Phiri	512	502	0.97	487	0.97	473	4th order
Motowabogobe	3 810	4 138	1.10	4 552	1.10	5 007	PCP
Kopermyn	2 652	2 615	0.96	2 510	0.96	2 410	5th order
Ga-Mathiba	1 924	1 867	0.96	1 792	0.96	1 721	4th order
Ga-Thaba	2 395	2 324	0.96	2 231	0.96	2 141	4th order

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Marulaneng	1 163	1 432	1.20	1 718	1.20	2 062	DGP
Klipspruit	125	122	0.96	117	0.96	112	4th order
Mphogodiba	62	66	1.07	71	1.07	76	PCP
Ga-Lekgothoane	1 070	1 038	0.96	997	0.96	957	4th order
Ga-Mogano	2 088	2 026	0.96	1 945	0.96	1 867	4th order
Bethel	453	440	0.96	422	0.96	405	4th order
Sebyeng	1 236	1 195	0.95	1 135	0.95	1 078	5th order
Marobo	937	1 153	1.20	1 383	1.20	1 660	DGP
Mmakata	1 229	1 315	1.07	1 407	1.07	1 506	PCP
Lithupaneng	2 682	2 579	0.95	2 450	0.95	2 327	5th order
Makatiane	1 081	1 039	0.95	987	0.95	938	5th order
Sekgweng	1 304	1 254	0.95	1 191	0.95	1 132	5th order
Tsebela	889	862	0.96	828	0.96	795	4th order
Magokubung	164	157	0.95	149	0.95	142	5th order
Mamatsha	3 767	3 622	0.95	3 441	0.95	3 268	5th order
Ga-Molalemane	216	210	0.96	201	0.96	193	4th order
Zion City Moria	4	4	1.07	5	1.07	5	PCP
St Engena's ZCC	633	678	1.07	725	1.07	776	PCP
Maripathekong	2 052	2 525	1.20	3 030	1.20	3 636	DGP
Ga-Molepo	1 945	1 887	0.96	1 812	0.96	1 739	4th order
Ga-Ramphere	1 844	1 789	0.96	1 718	0.96	1 649	4th order
Lekgadimane	1 046	1 006	0.95	955	0.95	908	5th order
Makgeng	418	401	0.95	381	0.95	362	5th order
Makubung	994	956	0.95	908	0.95	863	5th order
Mankgaile	2 609	2 508	0.95	2 383	0.95	2 264	5th order
Tholongwe	98	94	0.95	90	0.95	85	5th order
Mountain View	1 965	2 104	1.07	2 251	1.07	2 409	PCP
Makgopeng	379	364	0.95	346	0.95	329	5th order
Subiaco	293	284	0.96	273	0.96	262	4th order
Maboi	2 979	2 864	0.95	2 721	0.95	2 585	5th order
Ga-Sebati	2 472	2 398	0.96	2 302	0.96	2 210	4th order
Laaste Hoop Ward 7	3 448	3 315	0.95	3 150	0.95	2 992	5th order
Laaste Hoop Ward 7A	2 884	2 773	0.95	2 634	0.95	2 503	5th order
Manthorwane	1 015	1 249	1.20	1 499	1.20	1 798	DGP
Manthorwane Extension	506	622	1.20	747	1.20	896	DGP
Quayle	194	188	0.96	181	0.96	174	4th order
Nobody-Mothapo	10 156	10 873	1.07	11 634	1.07	12 449	PCP
Polokwane - Mooifontein S/H	3 487	3 734	1.07	3 995	1.07	4 275	PCP
Polokwane - Dalmada S/H	434	465	1.07	498	1.07	532	PCP
Polokwane – Myngenoegen	2 027	2 170	1.07	2 322	1.07	2 485	PCP
Polokwane – Palmietfontein	370	396	1.07	424	1.07	454	PGP
Polokwane - Roodepoort S/H	468	454	0.96	436	0.96	418	4th order
Ga-Magowa	4 201	4 076	0.96	3 913	0.96	3 756	4th order
Moshate	2 217	2 374	1.07	2 540	1.07	2 718	PCP

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Makgwareng	1 085	1 043	0.95	991	0.95	941	5th order
Phomolong	2 110	2 259	1.07	2 417	1.07	2 586	PCP
Ga-Ramogale	2 492	2 418	0.96	2 322	0.96	2 229	4th order
Mankweng B	2 949	2 835	0.95	2 693	0.95	2 559	5th order
Mankweng C	5 894	5 666	0.95	5 383	0.95	5 114	5th order
Mankweng E	2 867	2 757	0.95	2 619	0.95	2 488	5th order
Mankweng G Ext	2 580	3 175	1.20	3 809	1.20	4 571	DGP
Mankweng D	4 761	4 578	0.95	4 349	0.95	4 131	5th order
Mankweng Hospital	215	207	0.95	197	0.95	187	5th order
Mankweng G	3 582	3 444	0.95	3 271	0.95	3 108	5th order
Mankweng A	3 031	2 914	0.95	2 768	0.95	2 630	5th order
Mankweng F	4 382	4 300	0.95	4 085	0.95	3 881	5th order
University of the North	4 996	6 148	1.20	7 377	1.20	8 853	DGP
Ga-Makanye	7 802	7 570	0.96	7 267	0.96	6 976	4th order
Ga-Thoka	11 207	10 874	0.96	10 439	0.96	10 021	4th order
Ga-Mahlantlhe	415	402	0.96	386	0.96	371	4th order
Toronto Zondo	2 788	2 985	1.07	3 194	1.07	3 418	PCP
Ga-Silwane	6 895	6 690	0.96	6 423	0.96	6 166	4th order
Matshela-Pata	2 678	2 867	1.07	3 068	1.07	3 283	LSP
Losmycherry	1 089	1 047	0.95	995	0.95	945	5th order
Thabakgone	1 506	1 612	1.07	1 725	1.07	1 846	PCP
Melkboom	122	138	1.18	163	1.18	192	MGP
Ga-Moropo	1 774	1 722	0.96	1 653	0.96	1 587	4th order
Makengkeng	202	195	0.95	185	0.95	176	5th order
Lebowa	73	70	0.95	67	0.95	64	5th order
Leswane	904	887	0.95	843	0.95	801	5th order
Moshate	1 109	1 187	1.07	1 270	1.07	1 359	PCP
Masealama	479	590	1.20	708	1.20	850	DGP
Kgwara	816	791	0.96	760	0.96	729	4th order
Ga-Kama	2 332	2 263	0.96	2 172	0.96	2 085	4th order
Ga-Moswedi	383	372	0.96	357	0.96	343	4th order
Katzenstern	363	352	0.96	338	0.96	324	4th order
Ga-Mawashasha	770	747	0.96	718	0.96	689	4th order
Thema	111	107	0.95	101	0.95	96	5th order
Bergvley	213	206	0.96	198	0.96	190	4th order
Tsware	784	761	0.96	731	0.96	701	4th order
Ga-Kololo	164	159	0.96	153	0.96	147	4th order
Kgokong	509	494	0.96	474	0.96	455	4th order
Mamotintane	1 812	1 743	0.95	1 655	0.95	1 573	5th order
Ntshichane	1 965	2 104	1.07	2 251	1.07	2 409	PCP
Ga-Maphoto	112	108	0.96	104	0.96	100	4th order
Sentserere	119	115	0.95	109	0.95	104	5th order
Ga-Motholo	1 858	1 803	0.96	1 731	0.96	1 661	4th order
Ga-Potse	847	822	0.96	789	0.96	757	4th order
Masekwatse	483	517	1.07	554	1.07	592	LSP
Masekoleng	389	416	1.07	446	1.07	477	LSP
Badimong	10 371	10 062	0.96	9 660	0.96	9 273	4th order

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Ga-Mamphaka	1 422	1 380	0.96	1 325	0.96	1 272	4th order
Komaneng	2 290	2 202	0.95	2 092	0.95	1 987	5th order
Monywaneng	1 171	1 253	1.07	1 341	1.07	1 435	PCP
Mohlakeng	397	425	1.07	455	1.07	487	PCP
Segwasi	1 419	1 377	0.96	1 322	0.96	1 269	4th order
Mongwaneng	749	802	1.07	858	1.07	918	PCP
Thune	1 645	1 596	0.96	1 533	0.96	1 471	4th order
Nobody-Mothiba	8 638	9 248	1.07	9 895	1.07	10 588	PCP
Cottage	784	761	0.96	731	0.96	701	4th order
Makotopong 1	3 797	3 651	0.95	3 468	0.95	3 295	5th order
Makotopong 2	5 149	4 950	0.95	4 703	0.95	4 468	5th order
Kgwareng	366	355	0.96	341	0.96	327	4th order
Lenyenye	1 567	1 507	0.95	1 431	0.95	1 360	5th order
Madiga	2 807	2 699	0.95	2 564	0.95	2 435	5th order
Moduwane	691	740	1.07	791	1.07	847	PCP
Mphalong	124	133	1.07	142	1.07	152	PCP
Maselaphaleng	201	215	1.07	230	1.07	246	LSP
Mnashemong	2 540	2 719	1.07	2 910	1.07	3 113	PCP
Mehlakong	939	1 081	1.17	1 265	1.17	1 480	MGP
Makgwareng	805	774	0.95	735	0.95	699	5th order
Sefateng	851	825	0.96	792	0.96	761	4th order
Mantheding	2 152	2 649	1.2	3 178	1.2	3 814	DGP
Sebayeng A	7 414	8 536	1.17	9 987	1.17	11 685	MGP
Sebayeng B	8 441	9 718	1.17	11 370	1.17	13 303	MGP
Ga-Mokgopo	3 116	3 024	0.96	2 903	0.96	2 787	4th order
Makgoba 2	560	538	0.95	511	0.95	486	5th order
Dikgale 3	4 183	4 059	0.96	3 896	0.96	3 741	4th order
Dikgale 1	1 475	1 431	0.96	1 373	0.96	1 319	4th order
Dikgale 2	3 099	3 007	0.96	2 887	0.96	2 771	4th order
Dibibe	3 137	3 044	0.96	2 922	0.96	2 805	4th order
Makgoba 1	637	613	0.95	582	0.95	553	5th order
New Pietersburg	8 485	9 084	1.07	9 720	1.07	10 400	PCP
New Pietersburg	26 311	28 168	1.07	30 140	1.07	32 250	PCP
Polokwane	127 538	184 914	1.3	240 388	1.3	312 505	PGP
Palmietfontein C	554	593	1.07	634	1.07	679	PGP
Polokwane - Tweefontein S/H	2 575	2 757	1.07	2 950	1.07	3 156	PGP
Polokwane - SDA3	1 120	1 199	1.07	1 283	1.07	1 373	PGP
Polokwane - Palmietfontein	0	0	0	0	0	0	PGP
Polokwane - Geluk S/H	1 411	1 510	1.07	1 616	1.07	1 729	PCP
Seshego	83 256	110 652	1.3	143 848	1.3	187 002	PGP
Doornspruit	579	561	0.96	539	0.96	517	4th order
Doornspruit Ext	24	24	0.96	23	0.96	22	4th order
Makweya	1 511	1 460	0.95	1 387	0.95	1 318	5th order
Ga-Mapangula	1 335	1 295	0.96	1 244	0.96	1 194	4th order
Ga-Mapangula Ext	125	122	0.96	117	0.96	112	4th order

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Sengatane	2 353	2 283	0.96	2 192	0.96	2 104	4th order
Newlands	2 056	2 201	1.07	2 355	1.07	2 520	PCP
Setotolwane High School	80	78	0.96	75	0.96	72	4th order
Chebeng	3 622	3 514	0.96	3 374	0.96	3 239	4th order
Pax College	430	461	1.07	493	1.07	527	PCP
Vaalkop 1	387	375	0.96	360	0.96	346	4th order
Vaalkop 2	213	206	0.96	198	0.96	190	4th order
Lefahla	151	145	0.95	138	0.95	131	5th order
Blood River	6 477	6 284	0.96	6 033	0.96	5 792	4th order
Blood River Extension	1 426	1 383	0.96	1 328	0.96	1 275	4th order
Chokoe	2 416	2 344	0.96	2 250	0.96	2 160	4th order
Kobo	621	602	0.96	578	0.96	555	4th order
Mabitsela	2 247	2 161	0.95	2 053	0.95	1 950	5th order
Matamanyane	2 834	3 034	1.07	3 246	1.07	3 473	LSP
Setati	1 825	1 754	0.95	1 666	0.95	1 583	5th order
Masobohleng	1 626	1 740	1.07	1 862	1.07	1 993	LSP
Mashita	1 413	1 512	1.07	1 618	1.07	1 732	LSP
Makgove	10 013	9 627	0.95	9 146	0.95	8 689	5th order
Perskebult	4 778	5 115	1.07	5 474	1.07	5 857	PCP
Perskebult Ext 1	1 423	1 524	1.07	1 630	1.07	1 744	PCP
Perskebult Ext 2	496	531	1.07	569	1.07	608	PCP
Mokgokong	2 606	2 790	1.07	2 986	1.07	3 195	PCP
Mabotsa	10 001	9 615	0.95	9 134	0.95	8 677	5th order
Moshate	2 217	2 374	1.07	2 540	1.07	2 718	PCP
Madikote	1 847	1 776	0.95	1 687	0.95	1 602	5th order
Koloti	5 958	5 728	0.95	5 442	0.95	5 170	5th order
Koloti Extension	1 012	973	0.95	924	0.95	878	5th order
Mabukelele	6 522	6 271	0.95	5 957	0.95	5 659	5th order
Ditengteng	997	967	0.95	919	0.95	873	4th order
Komape 1	344	331	0.95	315	0.95	299	5th order
Komape 2	1 365	1 312	0.95	1 246	0.95	1 184	5th order
Komape 3	1 283	1 233	0.95	1 172	0.95	1 113	5th order
Mamadila	1 472	1 416	0.95	1 345	0.95	1 278	5th order
Manamela	1 920	1 846	0.95	1 754	0.95	1 666	5th order
Kgoroshi	1 088	1 055	0.95	1 003	0.95	952	4th order
Kgoroshi (Mphela)	896	869	0.95	826	0.95	784	4th order
Kgorosi (Thansa)	882	856	0.95	813	0.95	772	4th order
Mahwibitswane	956	919	0.95	873	0.95	829	5th order
Ramagaphota	1 756	1 689	0.95	1 604	0.95	1 524	5th order
Polokwane - Doornbult S/H	1 150	1 231	1.07	1 317	1.07	1 410	PCP
Ga-Mabotsa	952	923	0.95	877	0.95	833	4th order
Mabotsa 1	1 636	1 573	0.95	1 494	0.95	1 419	5th order
Mabotsa 2	1 515	1 457	0.95	1 384	0.95	1 315	5th order
Montinti Park	223	239	1.07	256	1.07	274	PCP
Makgodu Ext	1 808	1 738	0.95	1 651	0.95	1 569	5th order
Ramongwane 2	5 821	6 232	1.07	6 668	1.07	7 135	PCP

Settlement	Population 2011	Projected 2020	Growth 2021-2030	Projected 2030	Growth 2031-2040	Projected 2040	Settlement classification
Kgohlwane	5 393	5 232	0.95	4 971	0.95	4 722	4th order
Makibelo	3 134	3 013	0.95	2 863	0.95	2 719	5th order
Ramongwane 1	2 627	2 812	1.07	3 009	1.07	3 220	PCP
Semenya	3 765	4 030	1.07	4 313	1.07	4 614	PCP
Matikireng	713	763	1.07	816	1.07	873	LSP
Total	**1025 167**	**1 143 499**	**1.11**	**1 269 729**	**1.13**	**1 433 387**	