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Department:
Co-operative Governance and Traditional Affairs
PROVINCE OF KWAZULU-NATAL



water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA



uMgungundlovu District Municipality

Development of Universal Access Plan for Water & Sanitation in KwaZulu-Natal

Final

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Department:
Co-operative Governance and Traditional Affairs
PROVINCE OF KWAZULU-NATAL

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LDM REPORT

Final Universal Access Plan

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LIST OF ABBREVIATIONS

CoGTA	Department of Cooperative Governance and Traditional Affairs
KZN	Kwa-Zulu Natal
UAP	Universal Access Plan
DWA	Department of Water Affairs
UW	Umgeni
DM	District Municipality
LM	Local Municipality
WSDP	Water Services Development Plan
WSA	Water Service Authorities
IA	Implementing Agent
IIWSP	Interim/Intermediate Water Supply Programme
IDP	Integrated Development Plan
MIG	Municipal Infrastructure Grant
SDF	Spatial Development Framework
RDP	Reconstruction and Development Programme
WTW	Water Treatment Works
WTP	Water Treatment Plant
WWTW	Waste Water Treatment Works
GIS	Geographic Information System
LOS	Level of Service
VIP	Ventilated Improved Pit

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1 EXECUTIVE SUMMARY

KwaZulu-Natal (KZN) Department of Cooperative Governance and Traditional Affairs (CoGTA) strategic priorities 2013/14 Programme 3 (Development Planning), the Department is mandated to prepare a Universal Access Plan (UAP) with a specific focus on citizen's access to water, sanitation as contained in the MEC's 2013/14 Vote 11 Budget Speech of the 30th May 2013.

In order to prepare a UAP, an all-inclusive conceptual water service plan was required for the ten (10) District Municipalities (DM's) of KZN (excluding the eThekweni Metropolitan Municipality) and also for the three Water Utilities in KZN, namely; Umgeni Water, Umhlatuze Water and Uthukela Water. The UAP for electricity has been undertaken by Eskom and does not form part of this report and findings.

All District Municipalities have set clear objectives to ensure that all citizens have access to basic levels of service which include:

- Upgrading or refurbishment of existing water services treatment works;
- Upgrading or refurbishment of existing water services schemes;
- Operate and maintain existing schemes and treatment works in a sustainable manner;
- Complete existing water services projects;
- Remove water services backlogs by implementing new projects.

The scope of this assignment was to determine the backlogs to access to basic water and sanitation needs within each District municipalities and thus provide an overall cost within each District municipality.

As part of this Universal Access Plan (UAP) assignment to determine the backlogs in water and sanitation; all documentation such as Water Services Development Plan (WSDP), Integrated Development Plan (IDP) and Water Service Master Plan (WSMP) had to be reviewed as these are strategic planning instruments which guides and informs all planning, budgeting, management and decisions making in the District Municipality. The Water Services Development Plan is also intended to address the sector planning needs of each of the Local Municipalities.

In order to identify the backlogs, draft water supply footprints were digitised forming water supply polygons by using existing water infrastructure available from Umgeni Water and the District Municipality. These water supply polygons were then used at the engagement meeting at uMgungundlovu. The water and sanitation attributes were confirmed and updated by the

operational and maintenance staff of uMgungundlovu, and water and sanitation backlogs identified. Also, captured at the engagement meeting were the existing water schemes and associated water and sanitation infrastructure. Due to time constraints and lack of engagement meetings with the District Municipality, not all water and sanitation infrastructure has been captured. An additional phase to this UAP project should be conducted in order to capture outstanding information.

Geographic Information System (GIS) analysis was used to capture all infrastructural attributes and the 2011 Eskom household points used to determine the backlogs numbers per water supply polygon. Statistics SA census data was used to calculate the average growth rate per annum between 2001/ 2011. The percentage growth was then applied to the 2011 to 2014 household's counts to determine the current estimated household counts. The Department of Human Settlement income was also used to determine the required consumptions and capacity requirements. Majority of the backlogs identified fall in the category of informal with no formal connection which equates to maximum per capita consumption of 70 l/c/d. This was the applied to the water supply polygons and the required consumptions identified in order to determine the conceptual bulk schemes.

To address these short term water and sanitation backlogs, conceptual water supply schemes were developed and costed according to the infrastructure rates given by Umgeni Water and SMEC South Africa's current water and sanitation projects undertaken. A total of 30 conceptual bulk schemes have been identified to address the water and sanitation backlogs ranging from schemes with small water treatment plants to bulk lines, reservoirs to reticulation and stand pipes connections to boreholes with tanks and hand-pumps. The selections of these conceptual schemes incorporated different factors such as income levels with consumption requirements, local topography, and number of households affected, spacing of the polygons without access to water, and the adjacent polygons with access to water.

This UAP encompassed the identification of gaps/backlogs in water and sanitation service delivery, and the provision of conceptual plans focusing on regional and bulk schemes with the associated cost estimates for the supply of these services. In areas where regional and bulk schemes aren't viable or where an interim water supply is needed, an alternative local scheme has been identified for prioritisation.

uMgungundlovu District Municipality, in terms of the Water Services Act, is the Water Services Authority in respects of its area of jurisdiction, apart from The Msunduzi. According to the 2011 census, there has been an increase in the number of households with water inside their yards as well as access to communal stands. Although Msunduzi falls within the uMgungundlovu District Municipality, they function as their own WSA and no engagement meetings were held or confirmed with them. At the engagements with uMgungundlovu, no representatives for the Mpofana Local Municipality were present due to unrest in the Municipality. It is for this reason that the GIS data received from Umgeni Water was used in order to determine accessibility to water and sanitation for these two Local Municipalities. An additional phase to this UAP project should be conducted in order to verify the access to water and sanitation and to capture water and sanitation infrastructure.

Table 1: Local Municipality with Population Distribution and Household Figures

Municipality	KZN Code	Population Size	Households
Impendle	KZN224	33 105	8 202
Mkhambathini	KZN226	63 142	1 4963
Mpofana	KZN223	38 103	10 452
Richmond	KZN227	65 793	16 440
Msunduzi	KZN225	618 536	163 992
uMngeni	KZN222	92 710	30 490
uMshwathi	KZN 221	106 374	28 124
uMgungundlovu District Municipality		1 017 763	272 663

The Statics SA Census 2011 indicates that the current population for the uMgungundlovu District Municipality is currently at 1 017 763 with the total number of households at 272 663 as listed in table 1 above. The current average growth rate is estimated at 0.84% from the 2011 Census. Table 4 below indicates the water backlogs identified from the 2011 Census data for the uMgungundlovu District Municipality.

Table 4: Census 2011 Water Services Backlogs

Municipality	Number of Households	Water Served Households	Water Backlogs Households	Percentage of Water Backlogs
Impendle	8206	6102	2104	25.64%
Mkhambathini	14961	9076	5885	39.34%
Mpofana	10454	8429	2025	19.37%
Richmond	16438	12231	4207	25.59%
The Msunduzi	163992	151284	12708	7.75%
uMngeni	30492	27645	2847	9.34%
uMshwathi	28118	21295	6823	24.27%
uMgungundlovu District Municipality	272661	236062	36599	13%

The total water backlogs identified from the Census data for the uMgungundlovu District Municipality is 36599 households which equates to 13% of the District Municipality and the total backlogs identified from the engagements with the uMgungundlovu District Municipality using the Eskom household points are 8512 households, which is 4% of the District Municipality. There were no engagements with Mpofana and Msunduzi and the backlogs in these areas have been assumed based on spatial and GIS data. There is a possibility that the backlogs could be higher once actual engagements are done to confirm backlogs. Table 5 below indicates the water backlogs identified at the engagement meetings.

Table 5: Water Service Backlogs Captured at Engagement with District Municipality

Municipality	2011 Eskom Household Dwellings	Growth Rate %	Factor	2014 Escalated ESKOM Household Dwellings	Water Backlogs Households	Percentage of Water Backlog
Impendle	6962	-1.34	1	6962	1652	23.73%
Mkhambathini	12411	0.67	1.0067	12494	4902	39.23%
Mpofana	8336	0.34	1.0034	8364	491	5.87%
Richmond	14114	0.4	1.004	14170	321	2.27%
The Msunduzi	114562	1.12	1.0112	115845	157	0.14%
uMngeni	23284	2.27	1.0227	23813	990	4.16%
uMshwathi	19824	-0.19	1	19824	0	0.00%
uMgungundlovu District Municipality	199493	-	-	201473	8512	4%

The backlogs for sanitation in the uMgungundlovu District Municipality from Census data reflects a total of 103299 households which equates to approximately 38% of the District Municipality and a total number of 40610 households were indicated as having backlogs from the engagement meetings which equates to approximately 20% of the District Municipality. There were no engagements with Mpofana and Msunduzi and the backlogs in these areas have been assumed based on spatial and GIS data. Table 6 indicates the sanitation backlogs identified from the 2011 Census data and Table 7 indicates the sanitation backlogs captured at the engagement meetings. Backlogs identified in Richmond indicates 92% which is an increase compared to Census data which indicates 56% and this is mainly due to the fact that Pits was indicated for a majority of the Municipality, and this forms part of a backlog as it is below that of RDP standards.

Table 6: Census 2011 Sanitation Backlogs

Municipality	Households	Sanitation Served	Backlogs	Percentage Backlogs
Impendle	8206	2675	5529	67.39%
Mkhambathini	14961	7797	7166	47.89%
Mpofana	10454	6432	4022	38.47%
Richmond	16438	7165	9273	56.41%
The Msunduzi	163992	113019	50975	31.08%
uMngeni	30492	17632	12855	42.17%
uMshwathi	28118	14647	13479	47.92%
uMgungundlovu District Municipality	272661	169367	103299	37.88%

Table 7: Sanitation Backlogs Captured at Engagement with District Municipality

Municipality	Water Borne	VIP	Pits	None	Private	Septic Tanks	Total Households	Percentage Backlogs
Impendle	0	6345	0	0	617	0	6962	8.86%
Mkhambathini	0	8872	0	0	3622	0	12494	28.99%
Mpofana	0	5104	0	491	2769	0	8364	38.98%
Richmond	938	168	10545		2520	0	14170	92.20%
The Msunduzi	115551	0	0	157	138	0	115845	0.25%
uMngeni	11426	0	1116	0	6595	4676	23813	52.02%

Municipality	Water Borne	VIP	Pits	None	Private	Septic Tanks	Total Households	Percentage Backlogs
uMshwathi	520	11939	0	0	4996	2369	19824	37.15%
uMgungundlovu District Municipality	128434	32428	11661	647	21257	7045	201473	20.16%
	160862		40610					
	80%		20%					
	Access		Backlog					

Conceptual schemes to eradicate the water backlogs have been proposed and costed accordingly in order to determine the total amount of funding needed for the District Municipality. The total cost for the proposed schemes is approximately R224 million. The cost to eradicate the sanitation backlogs was based on data obtained from service providers who are currently eradicating backlogs in the Harry Gwala District municipality. The rates used ranged between R6000 to R7000 to supply and lay a VIP per household, and hence we used a fixed rate of R7000. The total cost to eradicate sanitation backlogs is approximately R284 million.

Table 10 and 11 below indicates the estimated water backlogs infrastructure costs and the estimated sanitation backlogs infrastructure costs based on the conceptual schemes respectively. Figure 10 indicates the planned estimated infrastructure expenditure for eradicating both water and sanitation backlogs over the next five years.

Table 10: Water Infrastructural Costs

Local Municipality	Total
Impendle	R 18 238 401
Mkhambathini	R 155 753 776
Mpofana	R 30 162 049
Richmond	R 9 097 252
The Msunduzi	R 2 497 566
uMngeni	R 8 366 713
uMshwathi	R -
Total	R 224 115 757

Table 11: Sanitation Infrastructural Costs

Local Municipality Name	Rate/VIP	Remaining Expenditure
Impendle	R 7 000	R 4 319 000
Mkhambathini	R 7 000	R 25 354 746
Mpofana	R 7 000	R 22 820 326
Richmond	R 7 000	R 90 907 180
The Msunduzi	R 7 000	R 2 059 814
uMngeni	R 7 000	R 86 708 597
uMshwathi	R 7 000	R 51 555 000
Totals		R 283 724 664

The total cost with the study fees for the proposed water schemes is approximately R235 Million. The total cumulative cost to eradicate the water backlogs with 30 proposed schemes and the sanitation backlogs over the 5 years is approximately R565 Million which includes escalation. A cumulative summary of these costs is indicated in the Figure 10 below. Due to time constraints and lack of engagement meetings, this study was done at a high level for obtaining water and sanitation accessibility. A more in depth study must be done to verify the accessibility of water and sanitation in the district and the existing infrastructure as this will affect the number of backlogs, as well as the costing to eradicate them.

The projects listed in the Integrated Development Plan and those set out by the Department of Water Affairs which are shown in Annexure A and D are regional bulk schemes which are long term solutions to address backlogs and improve current water and sanitation infrastructure. These projects have are funded through the Municipal Infrastructure Grant and Municipal Water Infrastructure Grant which we have not considered when proposing conceptual alternate schemes to eradicate current backlogs. There could be overlapping of the proposed conceptual schemes to the regional bulk schemes and thus overlapping of infrastructure costs. The main reason that infrastructure cost could be overlapped is due to our mandate to develop conceptual schemes to eradicate the backlogs identified at the engagement meeting with the district municipalities. The staff could not identify the boundaries of the regional bulk schemes nor provide information on start and completion dates.

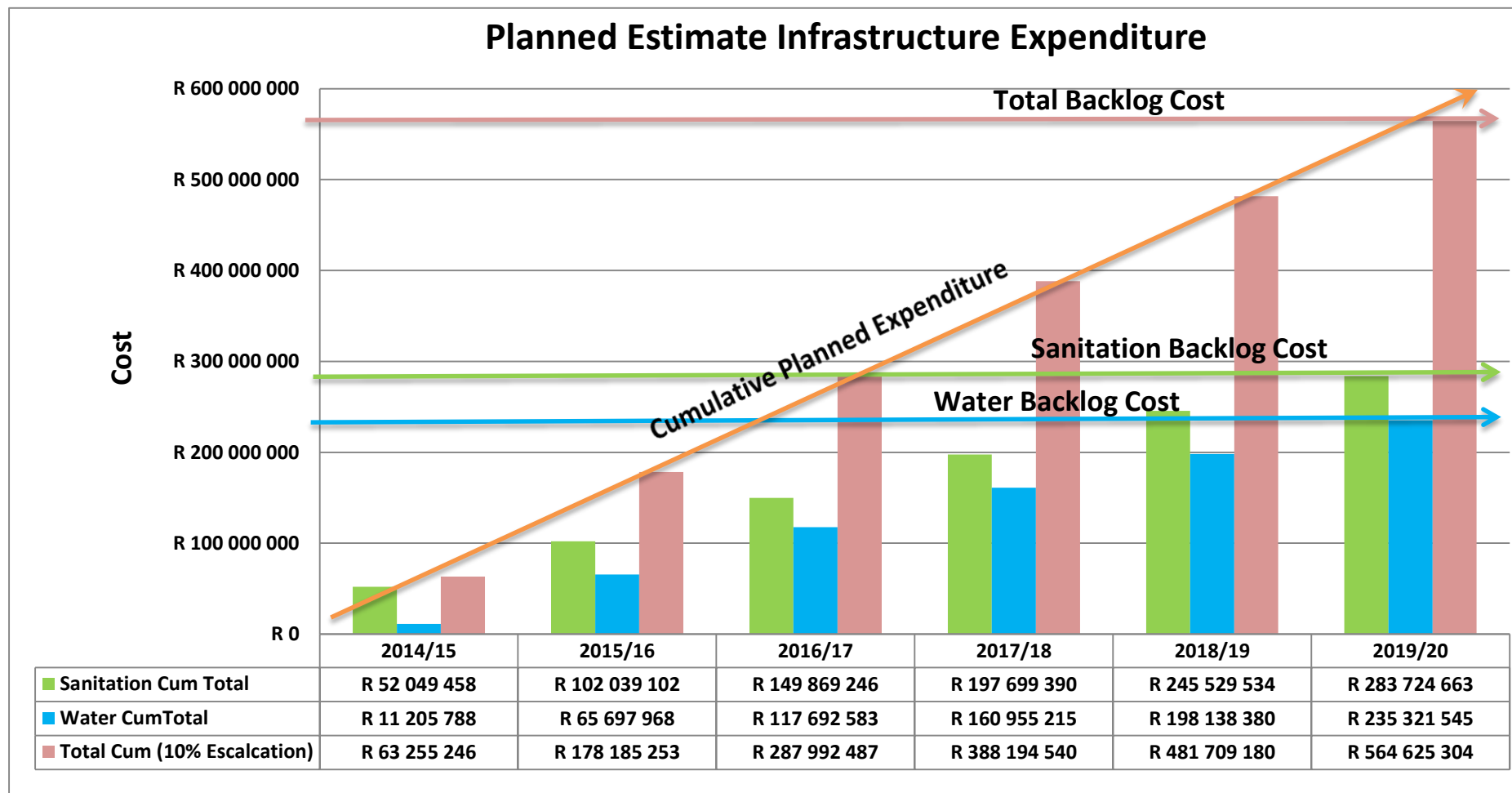


Figure 10: Water and Sanitation 5 Year Budget Plan

2 INTRODUCTION

In terms of the 'Department of Cooperative Governance and Traditional Affairs' (CoGTA's) strategic priorities 2013/14 Programme 3 (Development Planning), the Department has been mandated to prepare a Universal Access Plan (UAP) with a specific focus on access to water and sanitation.

Whilst a significant number of municipalities in KwaZulu-Natal are close to achieving universal access regarding key municipal infrastructure services such as water, sanitation and electricity; a need was identified, to formulate a plan to allow for the remaining backlogs to be quantified and the approximate costs of remedying these situations, established.

As a result, CoGTA's 'Municipal Infrastructure Development Business Unit' was directed to undertake the collection of all basic infrastructure backlog data; the verification of this data and the compilation of a Universal Access Plan document with a geo-database and an implementation programme, indicating the relevant milestones and associated infrastructure costs.

CoGTA thus enlisted Umgeni Water (UW), with the assistance of the 'Department of Water Affairs' (DWA), to act as the Implementing Agent (IA) for this project. This was aligned with the DWA's mandate to provide potable water to the people of South Africa; as well as the development of bulk Infrastructure Master Plans (IMP's) by water utilities such as Umgeni Water, uThukela Water, Umhlathuze Water.

In terms of Section 1 of the Water Services Act, 1997, the District Municipalities are the mandated Water Service Authorities (WSA's) that are required to develop 'Integrated Development Plans' (IDP's) and 'Water Services Development Plans' (WSDP's). In addition to these water supply plans, there are currently several other supporting programmes which include the DWA's 'Total Water Services Business Master Planning Process'; the 'All Town Study/Reconciliation Studies', the 'Prioritisation of Water Services to 24 District Municipalities', the 'Interim/Intermediate Water Supply Programme' (IIWSP) and the 'Municipal Infrastructure Grant' (MIG). Despite these many plans, it was still recognised by CoGTA that the water planning process to date, has not entirely fulfilled the water planning requirements of the province, as well as originally envisaged. Hence, on the 6th September 2013, Umgeni Water was requested by CoGTA to manage the water supply planning programme in KwaZulu-Natal and from this was born the design of the Universal Access Plan (UAP).

LDM was appointed by The Municipal Infrastructure Development Business Unit of CoGTA, to develop these Universal Access Plans, for Water & Sanitation, within five of the ten Districts, namely, iLembe, Harry Gwala, Umzinyathi, Uthungulu and uMgungundlovu. The process of developing these plans included the collection of infrastructure backlog data; the capture of water supply footprints and their verification; and confirmations of the existing bulk, reticulation networks and proposed new schemes; for each of the five awarded Districts. Also crucial, was the identification and mapping of 'gaps" of settled or residential areas that are without access to an acceptable level of water and sanitation services; and also the provision of conceptual plans focusing on regional and bulk schemes for the provision of these services. In areas where regional and bulk schemes are currently not feasible or where an interim water supply is needed, a local scheme was opted be used.

3 MAIN DELIVERABLES

In order to develop these Universal Access Plans, specific to each District Municipality, the following guidelines have been set by Umgeni Water:

- Assessment of water planning status quo;
- Identification of existing water supply schemes;
- Identification of already proposed future water supply options;
- Development of continuous water supply footprint areas covering the entire province, showing demographics, as well as current and required levels of service;
- Planned supply schemes (at a conceptual level) that can be constructed to supply all areas;
- Reconciliation of existing and proposed water supply and demand options;
- Provision of an updated geo-database including meta data of all relevant information; and finally the,
- Compilation of a UAP report for each District Municipality.

4 UMGUNGUNDLOVU DISTRICT MUNICIPALITY

The uMgungundlovu District Municipality (DC22) is located in Central KwaZulu-Natal bordering Lesotho, Sisonke, Ugu, EThekweni, iLembe, uMzinyathi, and the uThukela District Municipalities. uMgungundlovu consists of seven Local Municipalities, namely, Impendle, Mkhambathini, Mpofana, Richmond, Msunduzi, uMngeni, and uMshwathi.

Figure 1 below shows the orientation of these local municipalities within the District.

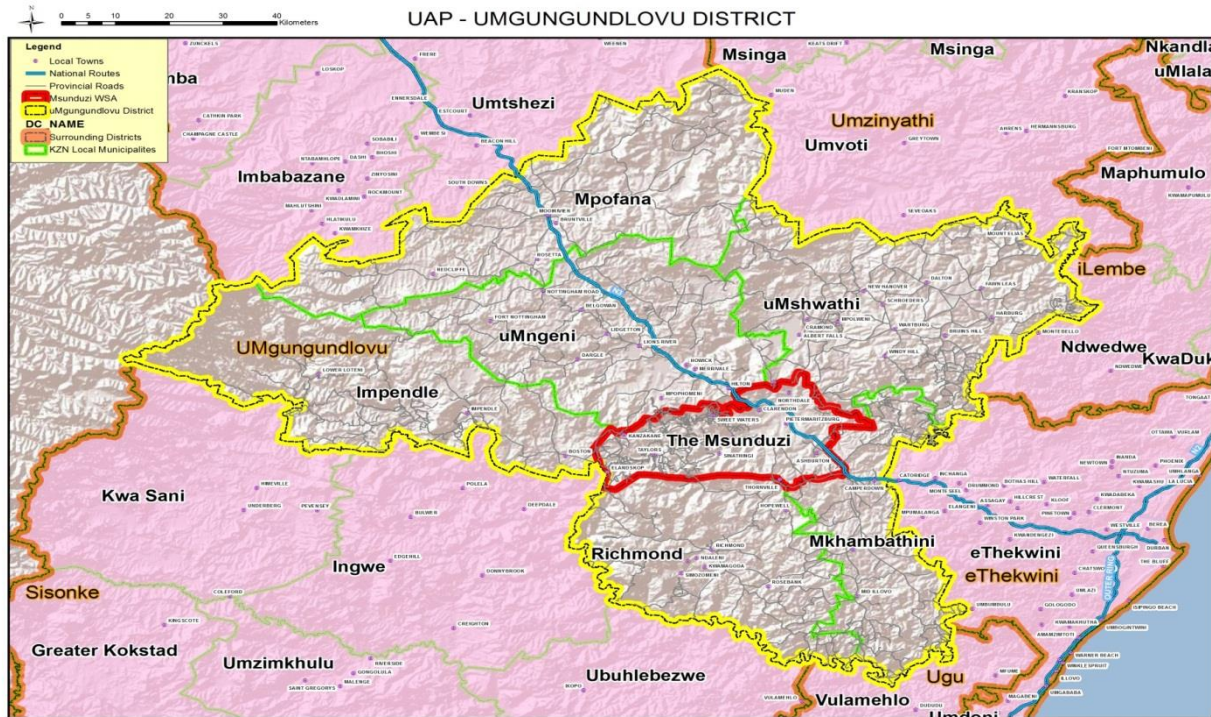


Figure 1: uMgungundlovu District Municipality Locality Map

4.1 Demographic Trends and Settlement Growth

The Statistic SA census 2011 indicates an overall increase in population growth. Msunduzi LM has the highest population in Umgungundlovu District with more than 60% residing in this local municipality. This is mainly due to Msunduzi been the major economic hub of the Umgungundlovu District. For an illustration of the dwellings within the uMgungundlovu District Municipality refer to Map 2 in Annexure B.

Table 1: Local Municipality with Population Distribution and Household Figures

Municipality	KZN Code	Population Size	Households
Impendle	KZN224	33 105	8 202
Mkhambathini	KZN226	63 142	14 963
Mpofana	KZN223	38 103	10 452
Richmond	KZN227	65 793	16 440
Msunduzi	KZN225	618 536	163 992
uMngeni	KZN222	92 710	30 490
uMshwathi	KZN 221	106 374	28 124
uMgungundlovu District Municipality		1 017 763	272 663

Stats SA 2011

5 WATER AND SANITATION STATUS QUO

The uMgungundlovu District Municipality is the Water Service Authority for six of the seven local municipalities within its jurisdiction, apart from the Msunduzi which serves as their own Water Service Authority. This core authoritative function of the municipality is carried and shared among three departments that form the back-bone of water service delivery, namely, Water Services, Project Management Unit (PMU) and Finance; with the delivery itself cutting across all the departments of the municipality.

The Water Services Department is responsible for the planning and design of new projects, and is also responsible for the operations and maintenance of all water and sanitation projects and water schemes. The PMU is responsible for overseeing the implementation and construction of approved projects, as well as signing off on their completion as per the project milestones and deliverables. The Finance Department monitors the expenses of the project by tracking all expenditure items against project specific votes.

5.1 Bulk Water Infrastructure

The uMgungundlovu District Municipality has plans for improving sustainability of water supply through implementation of further bulk schemes. This service provision will affect many households already deemed served and therefore the capital costs of building this infrastructure

cannot be incorporated in the calculation for backlog eradication. However, these plans to regionalize are practical and progressive and the costs need to be accounted for.

In order to efficiently plan the delivery of water, via bulk water infrastructure; a Water Services Development Plan has been developed to assist the individual Local Municipalities to align their projects, as set out by the Water Services Authority, i.e. uMgungundlovu District Municipality, and Msunduzi; to that of the Integrated Development Plan (IDP) and its strategy to providing water and sanitation services to the entire District. Refer to Annexure A and D for a list of projects and their descriptions as per DWA's Priority Action Plans (2013) and the IDP respectively.

Umgeni Water has provided the LDM consortium, also comprising of SMEC South Africa (LDM/SMEC) with the GIS data of some of their already captured water supply footprints and current water infrastructure; as well as DWA data such as the All Town Study. LDM/SMEC also obtained all IDP's and SDF's per District Municipality, in order to determine what infrastructural plans are in place within the uMgungundlovu District. All of this existing information was used as the basis in which to verify and enhance the data captured during the engagement meetings. These sessions played a pivotal role in acquiring the knowledge of local technical specialists within the District and Local Municipalities, in a collective bid to determining reasonably accurate backlogs.

Due to time constraints and lack of engagement meetings with the District Municipality, not all water and sanitation infrastructure has been captured. A high level study was conducted with the priority being the accessibility to water and sanitation. This was done in order to cost backlogs, and to compile the UAP report. An additional phase to this UAP project should be conducted in order to capture outstanding information.

5.2 Access to Water

Table 2 below gives an indication of the various types of 'water connections' within the uMgungundlovu District Municipality. The following information was captured at the engagement meetings held in August 2014 with representatives from the different Local Municipality's. Approximately 88% of the households' water accessibility in the uMgungundlovu District Municipality has not been confirmed. The types of access to water usually ranges from household connections, yard connections, standpipes, hand pumps, jojo tanks, and water

tankers. This information should be identified in an additional phase to this UAP project. Refer to Map 3: uMgungundlovu District Municipality Water Connection Types in Annexure B for an illustration of the water accessibility across the uMgungundlovu District Municipality.

Table 2: Access to Water

Access to Water	Standpipe	Private	Unable to Confirm	Grand Total
Impendle	5726	617	619	6962
Mkhambathini	0	3622	8872	12494
Mpofana	0	0	8364	8364
Richmond	0	2520	11650	14170
The Msunduzi	0	0	115845	115845
uMngeni	0	6595	17217	23813
uMshwathi	0	4996	14828	19824
Total	5726	18351	177396	201473
	3%	9%	88%	100%

5.3 Current Water Supply Status

The current water supply status offers an indication of water provision/delivery to households; as well as if they fall within municipal jurisdiction or within privately owned sectors, primarily farm lands. This is depicted in Figures 2 and 3.

This information is as a result of the engagement meetings that were held at the uMgungundlovu District Municipality, and by using GIS data provided to us by Umgeni Water for the Local Municipalities where no engagements were done. This information indicates that approximately 85% of all households in the District have access to water at a minimum RDP standard, while 4% of households do not have access to drinking water or have water supplied at standards that are below that of the RDP minimum, and finally just 11% fall within privately-owned properties.

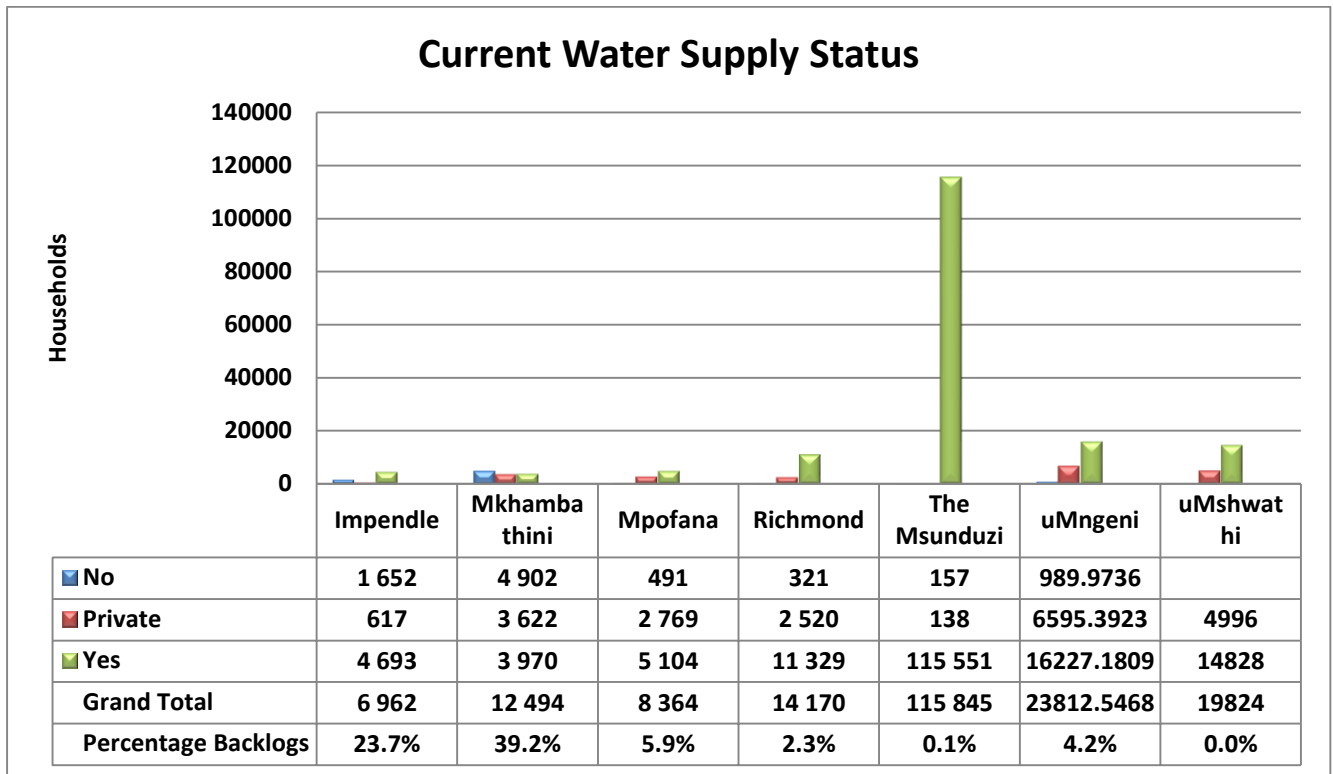


Figure 2 : Current Water Supply Status

In Figure 2 above, No refers to households below RDP standards which constitute a backlog, while Yes refers to households that have access to water above that of RDP Standards.

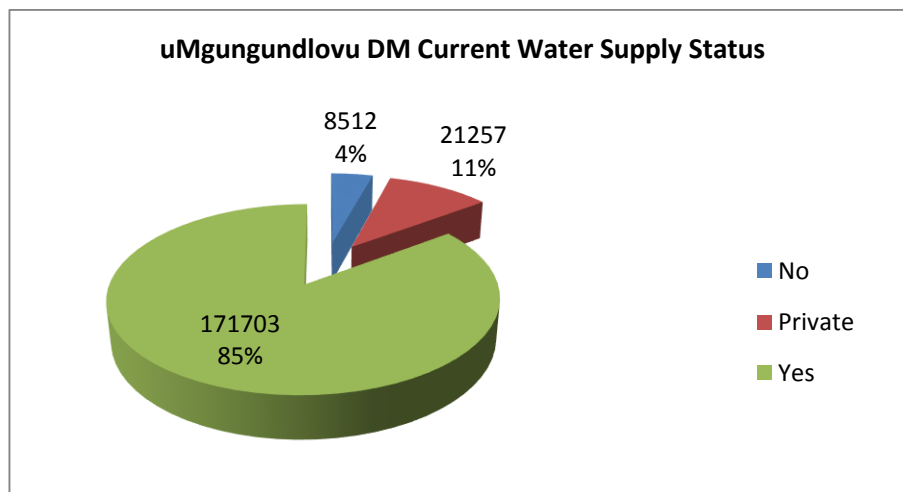


Figure 3 : Current Water Supply Status Percentage Breakdown

Refer to Map 1: uMgungundlovu District Municipality Water Supply in Annexure B for a depiction of the water supply in the District.

6 CONTINUOUS WATER SUPPLY FOOTPRINTS

One of the main deliverables of this project was to develop a continuous water supply footprint that describes the current and future supply capacity for the District Municipality. These footprints comprise of polygons that define autonomous supply zones that are either currently supplied or have the potential to be supplied with water from a particular water source.

6.1 Capturing of Draft Water Supply Footprints

Infrastructure data such as bulk infrastructure and reticulation networks obtained from Umgenti Water was initially used to capture and digitise these water supply footprints as polygons on GIS. Where no reticulation was present, then the assumption was made that households located within these polygons do not have basic services. Having drawn up the footprint polygons, the water supply or lack thereof was then confirmed with the District Municipality at the Delphi engagement meetings and all polygons and associated attribute data was updated accordingly.

The water supply polygons that were confirmed as having sustainable drinking water have been updated, with their attributes in Annexure C.

The polygons representing footprint areas that do not have sustainable drinking water have been grouped, and conceptual schemes have been proposed. These conceptual schemes may consist of borehole schemes, small bulk schemes with package plants, pump stations, bulk lines and reservoirs with reticulation; and in more remote and sparsely populated areas spring protection and water harvesting schemes have been proposed.

Households identified with no current water supply, but were situated close to towns that have bulk infrastructure, have been incorporated into these existing bulk scheme. If these current bulk schemes have inadequate capacity to supply the no-supply households, then an upgrade or expansion to the existing water treatment works, as well as new reservoirs, was proposed. Refer to Maps 11, 14, 17, 20, 23, 26 and 29, in Annexure B for the illustration of water supply footprints in each of the Local Municipalities.

The establishment of footprints for sanitation provision was undertaken in a similar way to that of water supply; and areas where mapped accordingly. Sanitation infrastructure included both ventilated improved pit latrines (VIP's) and waterborne sewerage systems. Refer to Maps 13,

16, 19, 22, 25, 28 and 30 in Annexure B for the illustration of sanitation supply in each of the Local municipalities.

6.2 Water & Sanitation Attribute Data

Figure 4 below illustrates the Delphi/Engagement data capture processes that have been applied in order to obtain the necessary data required for the Water Footprint Areas. These attributes or required information, have been extracted from the Umgeni Water terms of reference and is a means of providing value to the GIS data that is being captured. This data will also be handed back to the District Municipalities for their own use. During the engagement meetings, attribute data for the infrastructure was captured as it was provided to us by the staff. In the event that municipal operational staff could not provide us with the necessary information; assumptions had to be made on their part, so as to allow for reasonably complete data collection. All collected data was supported by a 'confidence level indicator', which in such cases, was selected as 'low'. The reverse of 'high', being allocated to those attributes of which the staff could confirm. The collected/confirmed attribute data for the infrastructure was then collectively applied to the captured water supply footprint with additional information regarding the current supply. The data obtained within the Delphi sessions was then used to compile the UAP for the uMgungundlovu District Municipality. It was therefore essential that all data captured was accurate and reliable. Due to time constraints and lack of engagement meetings with the District Municipality, assumptions were made using GIS provided to us by Umgeni Water and was verified and updated during the limited engagement meetings. This data included that of reservoir points, bulk lines, boreholes, and water and sanitation treatment facilities. The entire water and sanitation infrastructure were not captured or verified during the engagements and this should be addressed in an additional phase of this UAP project.

A detailed description of the attribute fields listed in Figure 4 below is indicated in Annexure C. This represents the level of attribute data which we aimed to collect at the engagement meetings with the Districts Municipalities, wherein which these attributes were partially confirmed.

6.3 Engagement Meeting to Verify GIS Information

The process followed in capturing water schemes was such that the supply source was firstly identified. This source then led either directly to reservoirs; or to a water treatment facility, prior to a reservoir; and in some cases, directly to pump stations, used to get the water to the

reservoirs itself. Bulk water pipelines were identified for the movement of water from the supply source through to the reservoirs. From the reservoirs water would reticulate to households or to communal standpipes. All of this information was captured in the GIS.

This process of verifying all GIS data with the uMgungundlovu District Municipality was completed at the end of August 2014. The data collected at the Delphi/Engagement meeting was processed and the attributes updated on the Geo-Database for the uMgungundlovu District Municipality. The data has confirmed backlogs and areas that require interventions with regards to water and sanitation upgrades, existing schemes, proposed new schemes and the cost thereof.

It must be noted that due to time constraints and problems with arranging engagement meetings with the District Municipality, a high level study was conducted where only important data was collected that would be used to compile the UAP. This information consisted of water and sanitation access; scheme names, source type, type of water connection where available; and type of sanitation. Water Infrastructure such as the reservoirs, bulk lines, and supply sources were not identified in these engagement meetings. Only essential data was captured at the engagement meeting to determine water and sanitation backlogs and this data was used to design conceptual schemes and thus cost these schemes to determine estimated overall cost to eradicate these backlogs.

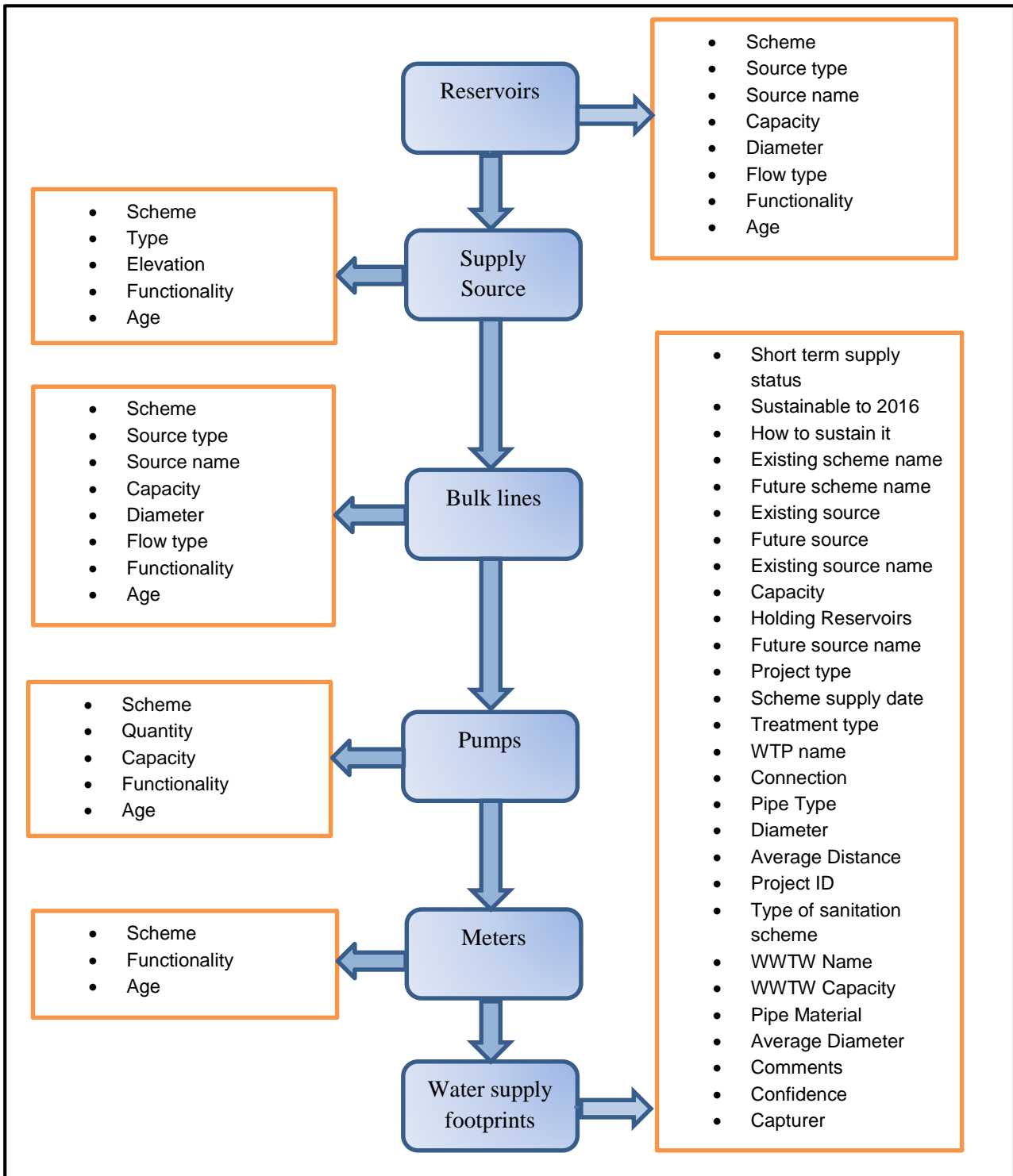


Figure 4: Water & Sanitation Attributes Data

7 EXISTING WATER SCHEMES

The identification of the existing water and sanitation schemes, have been determined via confirmations with the uMgungundlovu District Municipality during the engagement meetings. The process involved identifying areas which have access to piped water either from known sources such as water treatment works, reservoirs, boreholes or springs; to household connections or standpipes.

LDM /SMEC South Africa have engaged with the various Local Municipality’s and departments to determine the accuracy of the GIS water supply footprints and confirmed all attribute data as per Figure 5, 6 and Annexure C. The data has been updated in the Geo-Database and will form part of the deliverable to CoGTA.

Water Scheme Options

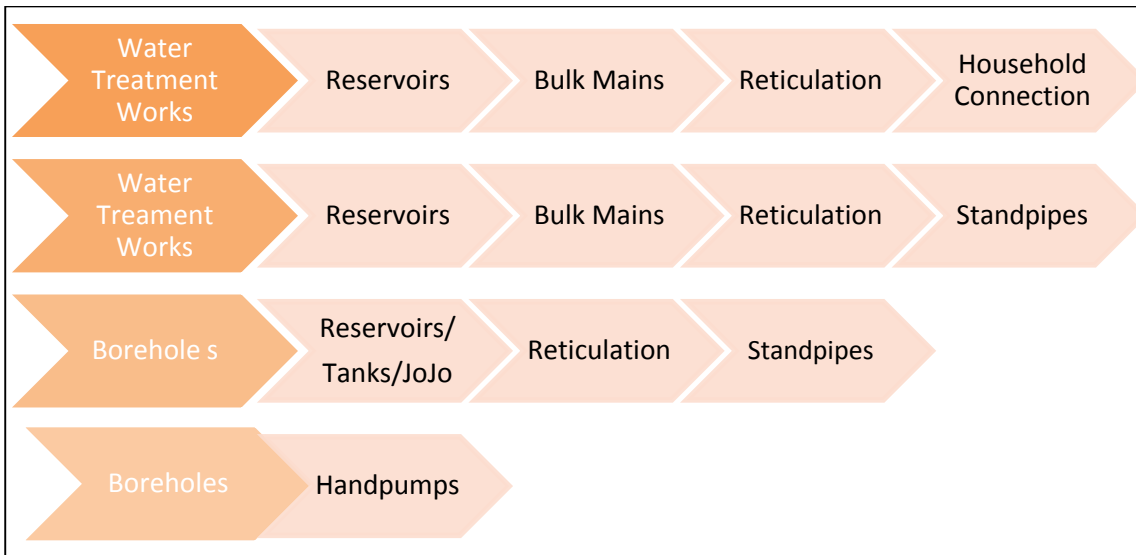


Figure 5 : Water Scheme Options

Sanitation Scheme Options

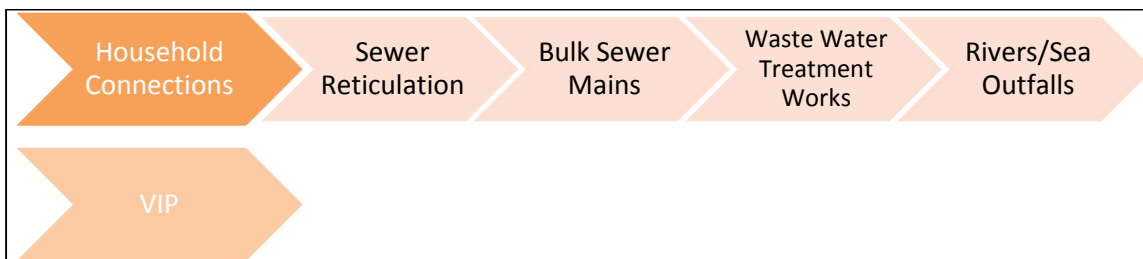


Figure 6: Sanitation Scheme Options

Due to the time constraints for engagement meetings with the District Municipality, the total number of schemes present for the district cannot be tabulated. The majority of schemes were not confirmed with just water accessibility being confirmed. Table 3 below is an indication of some of the existing water sources that was captured during the engagement meetings. The number listed below is an indication of the number of captured water footprints. We have proposed alternate schemes for the footprints with no water and those that obtain water from sources below that of RDP standards such as river, hand pumps, and water tankers.

Table 3 : Existing Water Sources

Existing Sources	Number
Borehole	19
Dam	5
Emakheni River	2
Local Water Scheme	11
Midmar Dam	15
Private	168
Reservoir	8
River	22
Spring	1
Unable to Confirm	239
Water Tanker	18
Total	508

8 RECONCILIATION OF EXISTING & PROPOSED WATER SUPPLY

On completion of the engagement meetings with the uMgungundlovu District Municipality, the data that was collected had been processed and existing water and sanitation schemes identified. This has assisted in indicating those areas where there is a backlog on services or where local/bulk schemes are required. In order to meet full Universal Access, we have proposed schemes to eradicate the backlogs. This is in the form of conceptual design schemes. These proposed schemes are provided in the Geo-Database.

8.1 uMgungundlovu Water Sources

uMgungundlovu has a number of significant rivers and dams that fall within the district which contributes towards providing water for the District. The major rivers should be further investigated to determine if possible dam sites can be identified along them to provide water to backlogged areas. A list of these rivers and dams that fall in the uMgungundlovu District is listed in the table below as obtained from the uMgungundlovu IDP 2014 - 2015 dated 27th June 2014. Refer to Map 6 for an illustration of the major water resources in the uMgungundlovu District Municipality.

Most of these water resources listed below form part of the Mgeni System which supplies water to about 5 million people in the eThekweni and uMgungundlovu regions. This system comprises of the Midmar, Albert falls, Nagle, Spring Grove, and Inanda Dams. The Mearns Weir is situated at the confluence of the Mooi and Little Mooi rivers. The Mgeni System is comprised of two sub systems, being the Upper Mgeni System which feeds mainly the uMgungundlovu District Municipality and the Msunduzi Municipality, and the Lower Mgeni system which feeds the eThekweni Municipality. The Upper Mgeni System feeds the Midmar and the D.V. Harris Water Treatment Plants. The Midmar WTP has a design capacity of 200MI/day and is scheduled to be upgraded to 375MI/day and the D.V. Harris WTP has a design capacity of 110MI/day.

Development of UAP for Water & Sanitation in Kwazulu-Natal

Water Resource	Type	Catchment	Importance
Mearns Weir	Dam	Mooi	Provides water for the Durban-Pietermaritzburg economy
Little Mooi	River	Mooi	Provides water for the Mpofana Municipality and the Durban-Pietermaritzburg economy. The headwaters of this river are in Mpofana Local Municipality
Mooi	River	Mooi	Provides water for the Mpofana Municipality and the Durban-Pietermaritzburg economy. The headwaters of this river are in Mpofana Local Municipality
Craigieburn Dam	Dam	Mooi	Located on the Myamvubu River, a tributary of the Mooi River, this dam provides water for agricultural use. Domestic use is proposed for this Dam
Spring Grove Dam	Dam	Mooi	Provides water for the Mpofana Municipality, the uMngeni Municipality and the Durban-Pietermaritzburg economy.
Mpofana	River	Mgeni	This is the river that transfers the water from the existing Mearns Weir and will transfer from the proposed Spring Grove Dam to Midmar Dam (via the Lions and Mgeni Rivers) for treatment for distribution to the Durban-Pietermaritzburg economy. The headwaters of this river are in the uMngeni Local Municipality.
Lions	River	Mgeni	This is the river through which water is transferred from the Mooi Catchment to Midmar Dam for treatment and distribution to the Durban-Pietermaritzburg economy. The headwaters of this river are in the uMngeni Local Municipality.
uMngeni	River	Mgeni	This is the river which provides water for the Durban-Pietermaritzburg economy. The headwaters of this major river are the Mgeni Vlei which is located in Impendle Local Municipality.
Midmar Dam	Dam	Mgeni	This is the critical storage dam for the entire Durban-Pietermaritzburg economy (the entire Msunduzi Municipality) as well as for the uMngeni, uMshwathi, Richmond and Mkhambathini Local Municipalities. Current treatment costs are low due to the close proximity of the water treatment plant (WTP) to the dam and the good water quality within the dam. However, if water quality deteriorates within the dam, treatment costs will increase drastically as there is insufficient distance between the dam and the WTP for in-stream purification to occur. The implication of this is that the water tariff will increase thereby increasing the cost of water to everyone within the region. This will impact negatively on the alleviation of backlogs and the development of the economy.

Development of UAP for Water & Sanitation in Kwazulu-Natal

Water Resource	Type	Catchment	Importance
Albert Falls	Dam	Mgeni	This is a storage dam on the uMngeni River that is used in the transfer of raw water to Durban Heights WTP for distribution within eThekweni's Central and Southern regions. If water quality deteriorates within this Dam, there is sufficient distance between Albert Falls Dam and Durban Heights WTP for in-stream purification to occur to a certain degree. However, treatment costs will again increase if the water quality is of an extremely poor standard.
Nagle Dam	Dam	Mgeni	This is a storage dam on the uMngeni River that is used in the transfer of raw water to Durban Heights WTP for distribution within eThekweni's Central and Southern regions. If water quality deteriorates within this Dam, there is insufficient distance between Nagle Dam and the Nagle Aqueducts, which transfer water to Durban Heights WTP for in-stream purification to occur. This means that treatment costs will rise thereby increasing the water tariff.
Msunduzi	River	Mgeni	This is a third-order tributary of the uMngeni River which flows through Edendale and Pietermaritzburg. The headwaters of this river occur in the Richmond Local Municipality.
Mlazi	River	Mlazi	This river has its source in the Richmond Municipality, flowing through it and the Mkhambathini Municipality providing good quality water for agriculture, forestry and domestic purposes.
Lovu	River	Lovu	This river also originates in the Richmond Municipality, flowing through it and the Mkhambathini Municipality, providing water for agriculture, forestry and domestic purposes.
Mkomazi	River	Mkomazi	The lower portions of this major river form the boundary between Richmond Municipality and the Harry Gwala and Ugu District Municipalities. A small portion on the upper part of the river is situated within the Impendle Local Municipality.
Mdloti	River	Mdloti	The headwaters of this river are located in uMshwathi Municipality. Hazelmere Dam, which is located on the uMdloti River, is the primary source of water for the North Coast. Hence ensuring the good quality of the headwaters of this river is important in the prevention of serious water supply problems which would have a negative impact on the region's economy.
Mvoti	River	Mvoti	The headwaters of this major river are located in uMshwathi Local Municipality.

(uMgungundlovu IDP 2014 – 2015)

8.2 Water Backlogs

Water and sanitation backlogs may be defined as households (excluding farms) without access to safe water & sanitation services. In the case of water, safe access is deemed to include communal standpipes, yard standpipes and household connections. Households without access to these minimum services therefore constitute a backlog. Refer to Map 4 in Annexure B for the illustration of the water backlogs.

Table 4 indicates the backlogs in terms of households for each Local Municipality and for the District Municipality that have been identified from the 2011 census data. From here we can see that the Local Municipality with the greatest amount of backlogs is Mkhambathini with a backlog of 39%. The Msunduzi has the lowest amount of backlogs of approximately 8%. In terms of households, The Msunduzi has the greatest backlogs, which is 12 708 households. The total backlogs identified from the Census data for the uMgungundlovu District Municipality is 36 559 households which equates to 13% of the District Municipality.

Table 5 indicates the backlogs that have been captured from the engagement meetings with the uMgungundlovu District Municipality. There is a significant difference in the percentage of backlogs in some of the local municipality from the Census 2011 information. This could be that water backlogs in these local municipalities have been eradicated. Also, there is a difference of approximately 71000 in the total number of households in the uMgungundlovu District Municipality from Census 2011 data. We have used the ESKOM household data as the correct number of households in the uMgungundlovu District Municipality. The total backlogs identified from the engagements with the uMgungundlovu District Municipality using the Eskom household points are 8512 households, which is 4% of the District Municipality. There were no engagements with Mpofana and Msunduzi and the backlogs in these areas have been assumed based on spatial and GIS data. There is a possibility that the backlogs could be higher once actual engagements are done to confirm backlogs.

The discrepancy in the household points of approximately 71000 between the Census and Eskom data is due to the reason that the Eskom household points are based on 2006 to 2010 data and is not current. We have also only used points that fall within and around the polygons that was captured. Some Eskom household points fall spatially onto rocks and boulders and have thus not been considered. These polygons were also captured using imagery dated 2010 and there is a possibility that these images may be dated prior to 2010.

Table 4: Census 2011 Water Services Backlogs

Municipality	Number of Households	Water Served Households	Water Backlogs Households	Percentage of Water Backlogs
Impendle	8206	6102	2104	25.64%
Mkhambathini	14961	9076	5885	39.34%
Mpofana	10454	8429	2025	19.37%
Richmond	16438	12231	4207	25.59%
The Msunduzi	163992	151284	12708	7.75%
uMngeni	30492	27645	2847	9.34%
uMshwathi	28118	21295	6823	24.27%
uMgungundlovu District Municipality	272661	236062	36599	13%

The Eskom household data that was received was based on 2011 data and has been factored to reflect as 2014 household counts. Where Local Municipality's had a negative growth rate, the value of households in 2011 was used as the 2014 value. The growth rate has been obtained from Stats SA and can be seen in Table 5 below.

Table 5: Water Services Backlogs Captured at Engagement with District Municipality

Municipality	2011 Eskom Household Dwellings	Growth Rate %	Factor	2014 Escalated ESKOM Household Dwellings	Water Backlogs Households	Percentage of Water Backlog
Impendle	6962	-1.34	1	6962	1652	23.73%
Mkhambathini	12411	0.67	1.0067	12494	4902	39.23%
Mpofana	8336	0.34	1.0034	8364	491	5.87%
Richmond	14114	0.4	1.004	14170	321	2.27%
The Msunduzi	114562	1.12	1.0112	115845	157	0.14%
uMngeni	23284	2.27	1.0227	23813	990	4.16%
uMshwathi	19824	-0.19	1	19824	0	0.00%
uMgungundlovu District Municipality	199493	-	-	201473	8512	4%

8.3 Sanitation Backlogs

Water and sanitation backlogs may be defined as households (excluding farms) without access to safe water & sanitation services. With regards to sanitation, safe access is deemed to include VIP's and chemical toilets. Households with levels of service below the minimum level i.e. unimproved pit latrines / rudimentary pit toilets and no sanitation at all, therefore constitute sanitation backlogs. Refer to Map 9 in Annexure B for the illustration of the sanitation backlogs.

Table 6 below indicates the backlogs in sanitation captured in the 2011 Census with a total of 272 661 households recorded. There is a high percentage of backlogs for sanitation in the uMgungundlovu District Municipality with a total of 103 299 households which equates to approximately 38%.

Table 6: Census 2011 Sanitation Backlogs

Municipality	Households	Sanitation Served	Backlogs	Percentage Backlogs
Impendle	8206	2675	5529	67.39%
Mkhambathini	14961	7797	7166	47.89%
Mpofana	10454	6432	4022	38.47%
Richmond	16438	7165	9273	56.41%
The Msunduzi	163992	113019	50975	31.08%
uMngeni	30492	17632	12855	42.17%
uMshwathi	28118	14647	13479	47.92%
uMgungundlovu District Municipality	272661	169367	103299	37.88%

Table 7 below indicates the backlogs in sanitation captured at the engagement meetings. A total number of 40 610 households were indicated as having sanitation below that of RDP standards, and thus being a backlog. This equates to approximately 20% of the uMgungundlovu District Municipality. Refer to Maps 7 and 8 in Annexure B for the illustration of the sanitation supply and the sanitation types for the uMgungundlovu District Municipality respectively. There were no engagements with Mpofana and Msunduzi and the backlogs in these areas have been assumed based on spatial and GIS data. Backlogs identified in Richmond indicates 92% which is an increase compared to Census data which indicates 56% and this is mainly due to the fact

that Pits was indicated for a majority of the Richmond Municipality, and this forms part of a backlog as it is below that of RDP standards.

Table 7: Sanitation Backlogs Captured at Engagement with District Municipality

Municipality	Water Borne	VIP	Pits	None	Private	Septic Tanks	Total Households	Percentage Backlogs
Impendle	0	6345	0	0	617	0	6962	8.86%
Mkhambathini	0	8872	0	0	3622	0	12494	28.99%
Mpofana	0	5104	0	491	2769	0	8364	38.98%
Richmond	938	168	10545		2520	0	14170	92.20%
The Msunduzi	115551	0	0	157	138	0	115845	0.25%
uMgeni	11426	0	1116	0	6595	4676	23813	52.02%
uMshwathi	520	11939	0	0	4996	2369	19824	37.15%
uMgungundlovu District Municipality	128434	32428	11661	647	21257	7045	201473	20.16%
	160862		40610					
	80%		20%					
	Access		Backlog					

8.4 Level of Service

The municipality provides various levels of service (LOS) to cater for the varying and unique needs to the different communities, within the confines of sustainability. Each level of service is unique to the various conditions relating to the use and upgrade and has different implications for the municipality in terms of capital and operational costs. The LOS addresses the basic standards and supports the concept of progressive improvement of LOS. In addition to these levels of service, the municipality also provides a rudimentary service, referred to as safe access, as an interim measure in areas that cannot be guaranteed with sustainable water resources.

Table 8: uMgungundlovu District Level of Service

Water Level of Service	Comments
LOS 1 - Communal Water Point	Basic LOS, consists of communal water points <ul style="list-style-type: none"> • Reticulated standpipes • Stationary water tank • < than 200m from households
LOS 2 - Yard Standpipe on each property	Metered or unmetered
LOS 3 - Metered Pressurised water connection on each property	Metered and connected to private plumbing
Sanitation Level of Service	Comments
LOS 1 - VIP on every informal property	<ul style="list-style-type: none"> • Preferred option Rural and informal settlements • Ventilated Improved Pit (VIP) latrine located on each site.
LOS 2 - Septic & Conservancy Tanks	<ul style="list-style-type: none"> • Not serviced by sewer reticulation and treatment system • Typically be provided too many formal housing developments.
LOS 3 - Water Borne Sewage on each serviced site	<ul style="list-style-type: none"> • Conventional waterborne municipal sewage network with individual sewer connections to each erf.

9 PLANNED AND PROPOSED WATER & SANITATION SCHEMES

9.1 Conceptual Design Approach

After conducting the engagements meetings with the uMgungundlovu District Municipality, LDM/SMEC has identified existing schemes and backlogs with regards to water and sanitation. At these meetings operational staff determined the accuracy of GIS data and assisted with updating the water and sanitation accessibility and attribute data where possible. This information was then processed and backlogs identified.

Using the Eskom household data, we were able to identify the total number of households in a specific area that had backlogs. We then used the Census income categories as listed in Table 9 to determine the demand for the area. Based on the number of households, and the density of these areas, a conceptual proposed scheme was put into place. Where areas were highly dense and there was a river nearby, water was to be extracted from the river and a small package plant was proposed for the treatment of water. Where no rivers are present, boreholes have been proposed. The surrounding areas with water supply were analysed to identify how water was obtained, and a similar approach was proposed. Using the topography of the area, high points were identified for placement of reservoirs and for the routing of the bulk lines. Areas that had a minimal number of households, and that was sparsely located, had boreholes with hand pumps proposed for them. It should also be noted that a feasibility study for the positioning of boreholes would need to be undertaken as their positions are subject to change.

An illustrative example of the proposed schemes that can be found in the geo-data base can be seen in figures 7, 8, and 9 below. Figure 7 represents a scheme where water is obtained from a river and is pumped up to a WTW, and then it is pumped to reservoirs which will reticulate to standpipes. A typical rudimentary scheme where water is pumped from a borehole to reservoirs and then gravitates to standpipes can be seen in figure 8. Figure 9 illustrates an area where households are isolated in an area away from densely populated areas. This area has been provided with an alternate supply scheme of boreholes with hand pumps as it is not feasible to construct a reservoir and supply them with standpipes.

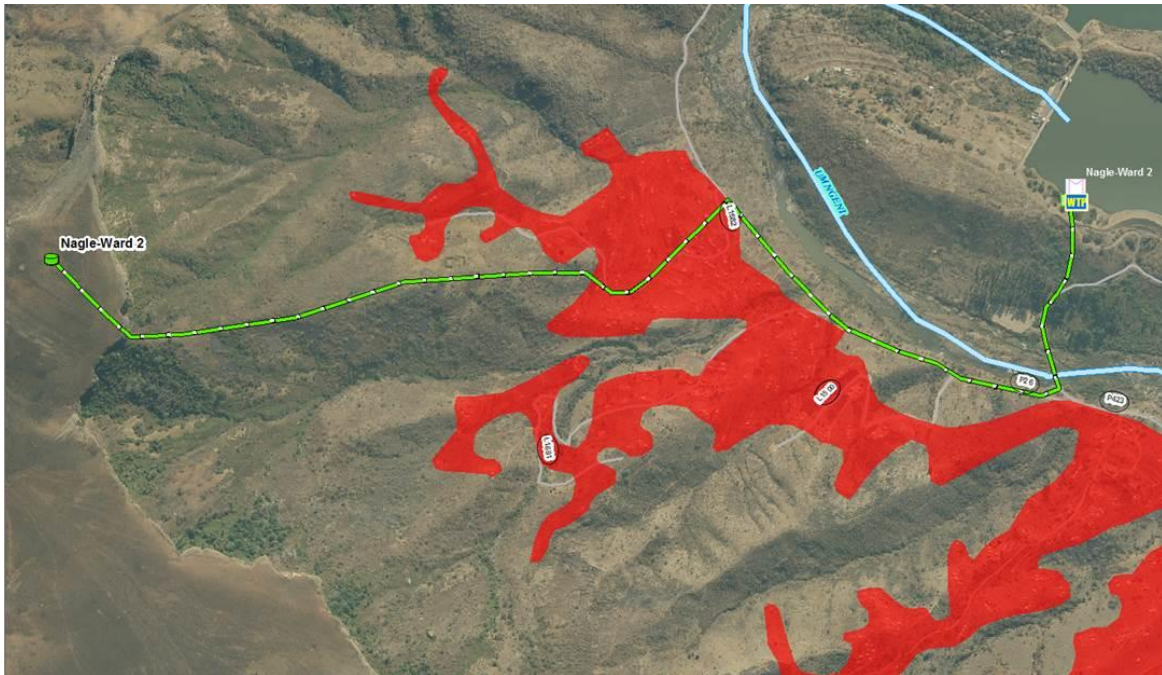


Figure 7: WTW to Reservoir Scheme

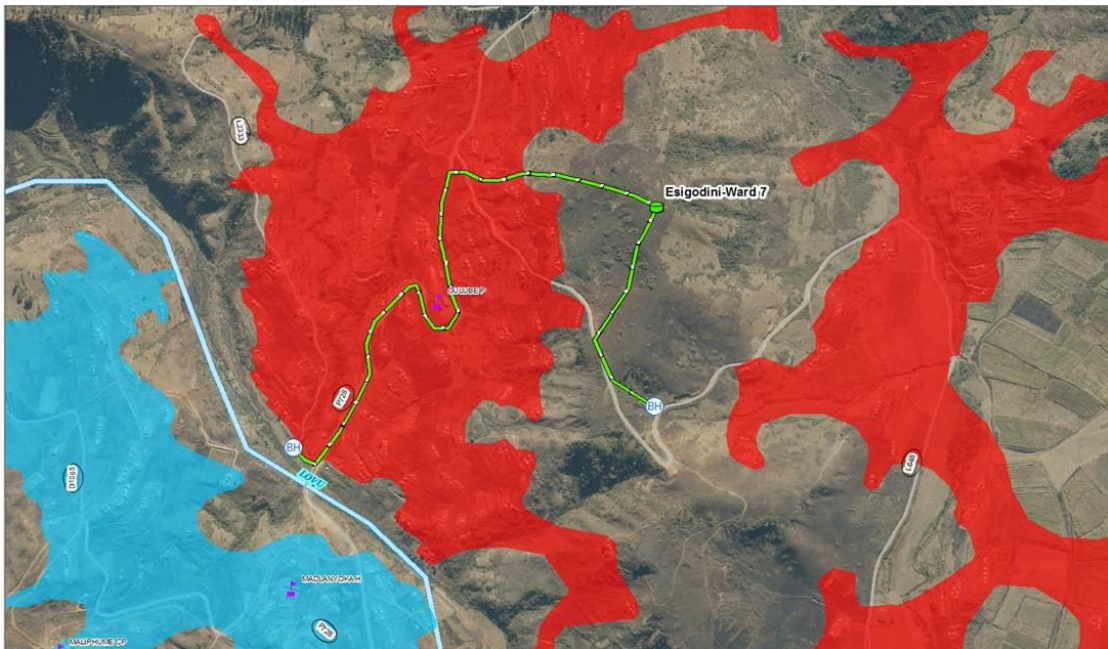


Figure 8: Borehole to Reservoir Scheme



Figure 9: Borehole with Hand Pumps Scheme

9.2 Assumptions

In order to cost the water and sanitation backlogs, certain assumptions had to be made and are as follows:

9.2.1 Water

- 6 people per household;
- Reservoirs have a minimum storage capacity of 48 hrs;
- All reservoir pipework included in the cost of reservoir;
- All SCADA and electrical included in cost of reservoir;
- Reservoirs are concrete;
- All existing boreholes are functional;
- New borehole depths range from 100m to 200m;
- Water quality is good;
- Assume that yield and water quality testing are included in the cost of the borehole;
- Diameter of boreholes 150mm – 200mm with steel casting;
- All electrical pumps associated with the boreholes are included in the cost;
- All schemes have some form of power supply;
- Existing schemes have the potential to be upgraded;

- Reticulation costs are estimated at 40% of the overall bulk infrastructure costs;
- Reticulation pipes range from 25mm to 75mm dia. HDPE;
- No house connections are costed in proposed schemes;
- All end connections are standpipe connections not exceeding 200m;
- Where areas are extremely rural and scattered, then boreholes with hand pumps are proposed;
- All bulk pipelines range from 75mm to 250mm uPVC;
- Positions/location of reservoirs, boreholes, pump stations/booster pump stations, water treatment works/package plants and bulk lines are subject to change after a full pre-feasibility study has been undertaken.

9.2.2 Sanitation

- All sanitation backlogs are based on Ventilated Improved Pit (VIP).

9.3 Infrastructure Water & Sanitation Costs

The water demand was determined based on the household annual income. Table 10 below indicates the daily demand per capita required for the different categories of household income. The income values used was obtained from Stats SA Census 2011 data. The data reflects income at a Sub Place level and due to this, additional verification was done on the households without water as some of them fall in high income areas such as category 1 and 2. These categories were manually updated by looking at the surrounding Sub Place income categories and by spatial imagery depicting the type of dwelling. Refer to Maps 12, 15, 18, 21, 24 and 27 in Annexure B for the illustration of the proposed alternate schemes in each of the Local Municipalities and to Map 10 for an illustration of the Household Income Categories.

Table 9: Demand based on Household Income

Category	Description of consumer category	Household Annual Income range	Per capita cons (l/c/d)		
			Min	Ave.	Max.
1	Very High Income; villas, large detached house, large luxury flats	>R1 228 000	320	410	500
2	Upper middle income: detached houses, large flats	153 601 – 1 228 000	240	295	350
3	Average Middle Income: 2 - 3 bedroom houses or flats with 1 or 2 WC, kitchen, and one bathroom, shower	38 401 – 153 600	180	228	275
4	Low middle Income: Small houses	9 601– 38 400	120	170	220

Category	Description of consumer category	Household Annual Income range	Per capita cons (l/c/d)		
			Min	Ave.	Max.
	or flats with WC, one kitchen, one bathroom				
5	Low income: flatlets, bedsits with kitchen & bathroom, informal household	1- 9600	60	100	140
6	No income & informal supplies with yard connections		60	80	100
7	Informal with no formal connection		30	50	70
8	Informal below 25 l/c/d		0	12	25

9.3.1 Water Costs

Table 10 indicates the estimated water infrastructural costs for the short term interventions in each Local Municipality for the uMgungundlovu District Municipality. The rates used to compile these costs were obtained from the Umgeni Water terms of reference, as well as from rates used internally on other projects. A Detailed list for the costing of infrastructure is provided in the geo-database that is provided in conjunction with this report. The total cost to eradicate backlogs in the uMgungundlovu District Municipality is approximately R224 Million. A summarised list of the infrastructure in each proposed scheme and the cost associated to it is listed in Table 13.

The projects listed in the Integrated Development Plan and those set out by DWA which are shown in Annexure A and D are regional bulk schemes which are long term solutions to address backlogs and improve current water and sanitation infrastructure. These projects have are funded through the Municipal Infrastructure Grant and Municipal Water Infrastructure Grant which we have not considered when proposing conceptual alternate schemes to eradicate current backlogs. There could be overlapping of the proposed conceptual schemes to the regional bulk schemes and thus overlapping of infrastructure costs. The main reason that infrastructure cost could be overlapped is due to our mandate to develop conceptual schemes to eradicate the backlogs identified at the engagement meeting with the district municipalities. The staff could not identify the boundaries of the regional bulk schemes nor provide information on start and completion dates.

Table 10: Water Infrastructural Costs

Local Municipality	Total
Impendle	R 18 238 401
Mkhambathini	R 155 753 776
Mpofana	R 30 162 049
Richmond	R 9 097 252
The Msunduzi	R 2 497 566
uMngeni	R 8 366 713
uMshwathi	R -
Total	R 224 115 757

9.3.2 Sanitation Costs

Table 11 indicates the estimated sanitation infrastructural costs for Ventilated Improved Pits. The cost to eradicate the sanitation backlogs was based on data obtained from service providers who are currently eradicating backlogs in the Harry Gwala District municipality. The rates used ranged between R6000 to R7000 to supply and lay a VIP per household, and hence we used a fixed rate of R7000 per VIP per household. The total number of households that have backlogs were identified from the engagement meetings and used to calculate the cost to eradicate sanitation backlogs. The total cost to eradicate backlogs in the uMgungundlovu District Municipality is approximately R284 Million.

Table 11: Sanitation Infrastructural Costs

Local Municipality Name	Rate/VIP	Remaining Expenditure
Impendle	R 7 000	R 4 319 000
Mkhambathini	R 7 000	R 25 354 746
Mpofana	R 7 000	R 22 820 326
Richmond	R 7 000	R 90 907 180
The Msunduzi	R 7 000	R 2 059 814
uMngeni	R 7 000	R 86 708 597
uMshwathi	R 7 000	R 51 555 000
Totals		R 283 724 664

9.4 Five Year Budget Plan for Water and Sanitation

Table 12 indicates the estimated short term budget expenditure. The sanitation estimate is based on an average expenditure over the next 5 years. Water cost estimates are based on a straight line over the next five years without any infrastructural expenditure in this current financial year besides planning and or feasibility study fees. The estimated feasibility study fees are based on 5% of the estimated construction cost. Escalation is estimated at 10% per year.

It must be noted that the identified short term schemes could be completed within 5 years if feasibility studies are undertaken in this financial year subject to the uMgungundlovu District Municipality having the funds to undertake these studies. The total cumulative cost to eradicate the water backlogs with 30 proposed schemes and the sanitation backlogs over the 5 years is approximately R565 Million which includes escalation. This projection over 5 years is subject to change if necessary. An illustration of the costing for the five years can be seen on figure 10 below. Due to time constraints and lack of engagement meetings, this study was done at a high level for obtaining water and sanitation accessibility. A more in depth study must be done to verify the accessibility of water and sanitation in the district and the existing infrastructure as this will affect the number of backlogs, as well as the costing to eradicate them.

Table 12: Five Year Budget Plan for Water & Sanitation

Local Municipality	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Impendle (Water)	R 911 920	R 6 079 467	R 6 079 467	R 6 079 467	R -	R -
Impendle (Sanitation)	R 2 159 500	R 2 159 500	R -	R -	R -	R -
Mkhambathini (Water)	R 7 787 689	R 31 150 755	R 31 150 755	R 31 150 755	R 31 150 755	R 31 150 755
Mkhambathini (Sanitation)	R 5 070 949	R 5 070 949	R 5 070 949	R 5 070 949	R 5 070 949	R -
Mpofana (Water)	R 1 508 102	R 6 032 410	R 6 032 410	R 6 032 410	R 6 032 410	R 6 032 410
Mpofana (Sanitation)	R 4 564 065	R 4 564 065	R 4 564 065	R 4 564 065	R 4 564 065	
Richmond (Water)	R 454 863	R 4 548 626	R 4 548 626	R -	R -	R -
Richmond (Sanitation)	R 15 151 197	R 15 151 197	R 15 151 197	R 15 151 197	R 15 151 197	R 15 151 197
The Msunduzi (Water)	R 124 878	R 2 497 566	R -	R -	R -	R -
The Msunduzi (Sanitation)	R 2 059 814	R -	R -	R -	R -	R -
uMngeni (Water)	R 418 336	R 4 183 357	R 4 183 357	R -	R -	R -
uMngeni (Sanitation)	R 14 451 433	R 14 451 433	R 14 451 433	R 14 451 433	R 14 451 433	R 14 451 433
uMshwathi (Water)	R -	R -	R -	R -	R -	R -
uMshwathi (Sanitation)	R 8 592 500	R 8 592 500	R 8 592 500	R 8 592 500	R 8 592 500	R 8 592 500
Totals	R 63 255 246	R 104 481 824	R 99 824 758	R 91 092 776	R 85 013 309	R 75 378 295
Escalation (10%)	R -	R 114 930 007	R 109 807 234	R 100 202 053	R 93 514 640	R 82 916 124
Cumulative Total	R 63 255 246	R 178 185 253	R 287 992 487	R 388 194 540	R 481 709 180	R 564 625 304

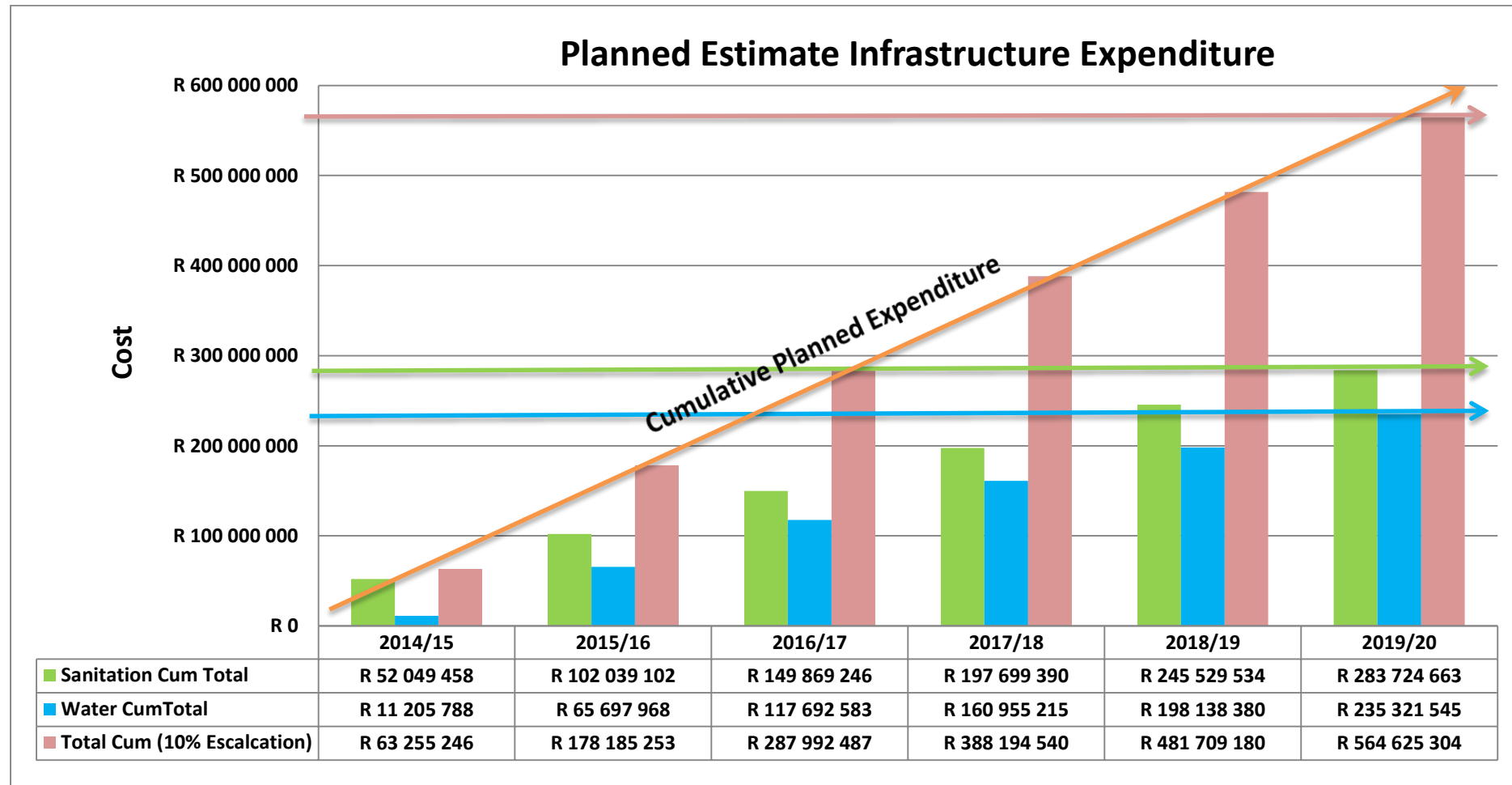


Figure 10: Water and Sanitation 5 Year Budget Plan

Table 13: Proposed Alternate Schemes

Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Mpofana NU-Ward 1/1	Borehole	Borehole 01 UAPUMGIMP01	Impendle	R 300 000	
Mpofana NU-Ward 1/1	Borehole	Borehole 02 UAPUMGIMP01	Impendle	R 300 000	
Mpofana NU-Ward 1/1	Borehole	Borehole 03 UAPUMGIMP01	Impendle	R 300 000	
Mpofana NU-Ward 1/1	Borehole	Borehole 04 UAPUMGIMP01	Impendle	R 300 000	
Mpofana NU-Ward 1/1	Borehole	Borehole 05 UAPUMGIMP01	Impendle	R 300 000	
Mpofana NU-Ward 1/1	Reservoir	Res01 UAPUMGIMP01	Impendle	R 478 652	
Mpofana NU-Ward 1/1	Reservoir	Res02 UAPUMGIMP01	Impendle	R 478 652	
Mpofana NU-Ward 1/1	Reservoir	Res03 UAPUMGIMP01	Impendle	R 478 652	
Mpofana NU-Ward 1/1	Reservoir	Res04 UAPUMGIMP01	Impendle	R 478 652	
Mpofana NU-Ward 1/1	Reservoir	Res05 UAPUMGIMP01	Impendle	R 478 652	
Mpofana NU-Ward 1/1	Bulk Line	Borehole 01 UAPUMGIMP01	Impendle	R 391 667	
Mpofana NU-Ward 1/1	Bulk Line	Borehole 02 UAPUMGIMP01	Impendle	R 196 966	
Mpofana NU-Ward 1/1	Bulk Line	Borehole 03 UAPUMGIMP01	Impendle	R 170 883	
Mpofana NU-Ward 1/1	Bulk Line	Borehole 04 UAPUMGIMP01	Impendle	R 451 348	
Mpofana NU-Ward 1/1	Bulk Line	Borehole 05 UAPUMGIMP01	Impendle	R 317 115	
Mpofana NU-Ward 1/1	Reticulation	RET_Mpofana NU-Ward 1/1	Impendle	R 2 168 495	
Mpofana NU-Ward 1/1	Total				R 7 589 733
Glenmile-Ward 1	Borehole	Borehole 01 UAPUMGIMP02	Impendle	R 300 000	
Glenmile-Ward 1	Borehole	Borehole 02 UAPUMGIMP02	Impendle	R 300 000	
Glenmile-Ward 1	Reservoir	Res01 UAPUMGIMP02	Impendle	R 824 662	
Glenmile-Ward 1	Bulk Line	Borehole 01 UAPUMGIMP02	Impendle	R 568 510	
Glenmile-Ward 1	Bulk Line	Borehole 02 UAPUMGIMP02	Impendle	R 492 840	
Glenmile-Ward 1	Reticulation	RET_Glenmile-Ward 1	Impendle	R 994 405	

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Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Glenmile-Ward 1	Total				R 3 480 417
Mpofana NU-Ward 1/2	Handpump	Borehole 01 UAPUMGIMP03	Impendle	R 270 000	
Mpofana NU-Ward 1/2	Handpump	Borehole 02 UAPUMGIMP03	Impendle	R 270 000	
Mpofana NU-Ward 1/2	Total				R 540 000
Sitofela-Ward 1	Borehole	DWAFBorehole 01 UAPUMGIMP04	Impendle	R 300 000	
Sitofela-Ward 1	Borehole	DWAFBorehole 02 UAPUMGIMP04	Impendle	R 300 000	
Sitofela-Ward 1	Reservoir	Res01 UAPUMGIMP04	Impendle	R 386 386	
Sitofela-Ward 1	Reservoir	Res02 UAPUMGIMP04	Impendle	R 386 386	
Sitofela-Ward 1	Bulk Line	DWAFBorehole 01 UAPUMGIMP04	Impendle	R 46 219	
Sitofela-Ward 1	Bulk Line	DWAFBorehole 02 UAPUMGIMP04	Impendle	R 77 469	
Sitofela-Ward 1	Reticulation	RET_Sitofela-Ward 1	Impendle	R 598 584	
Sitofela-Ward 1	Total				R 2 095 043
Mpofana NU-Ward 1/3	Handpump	Borehole 01 UAPUMGIMP05	Impendle	R 270 000	
Mpofana NU-Ward 1/3	Total				R 270 000
Mpofana NU-Ward 1/4	Borehole	Borehole 01 UAPUMGIMP06	Impendle	R 300 000	
Mpofana NU-Ward 1/4	Borehole	Borehole 02 UAPUMGIMP06	Impendle	R 300 000	
Mpofana NU-Ward 1/4	Reservoir	Res01 UAPUMGIMP06	Impendle	R 478 652	
Mpofana NU-Ward 1/4	Bulk Line	Borehole 01 UAPUMGIMP06	Impendle	R 203 864	
Mpofana NU-Ward 1/4	Bulk Line	Borehole 02 UAPUMGIMP06	Impendle	R 232 003	
Mpofana NU-Ward 1/4	Reticulation	RET_Mpofana NU-Ward 1/4	Impendle	R 605 808	
Mpofana NU-Ward 1/4	Total				R 2 120 327
Mpofana NU-Ward 1/5	Borehole	Borehole 01 UAPUMGIMP07	Impendle	R 300 000	
Mpofana NU-Ward 1/5	Borehole	Borehole 02 UAPUMGIMP07	Impendle	R 300 000	
Mpofana NU-Ward 1/5	Reservoir	Res01 UAPUMGIMP07	Impendle	R 656 852	

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Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Mpofana NU-Ward 1/5	Bulk Line	Borehole 01 UAPUMGIMP07	Impendle	R 160 266	
Mpofana NU-Ward 1/5	Bulk Line	Borehole 02 UAPUMGIMP07	Impendle	R 113 513	
Mpofana NU-Ward 1/5	Reticulation	RET_Mpofana NU-Ward 1/5	Impendle	R 612 252	
Mpofana NU-Ward 1/5	Total				R 2 142 883
uMngeni NU-Ward 4	Borehole	Borehole 01 UAPUMGMGE01	uMngeni	R 300 000	
uMngeni NU-Ward 4	Borehole	Borehole 02 UAPUMGMGE01	uMngeni	R 300 000	
uMngeni NU-Ward 4	Reservoir	Res01 UAPUMGMGE01	uMngeni	R 656 852	
uMngeni NU-Ward 4	Bulk Line	Borehole 01 UAPUMGMGE01	uMngeni	R 164 780	
uMngeni NU-Ward 4	Bulk Line	Borehole 02 UAPUMGMGE01	uMngeni	R 141 136	
uMngeni NU-Ward 4	Reticulation	RET_uMngeni NU-Ward 4	uMngeni	R 625 107	
uMngeni NU-Ward 4	Total				R 2 187 874
Res Upgrade	Reservoir	UpgradeRes 01 UAPUMGMGE02	uMngeni	R 3 089 419	
Res Upgrade	Reservoir	UpgradeRes 02 UAPUMGMGE02	uMngeni	R 3 089 419	
Res Upgrade	Total				R 6 178 839
Mgwenya-Ward 7	River Abstraction	MkhomaziRiver UAPUMGMKH01 01	Mkhambathini	R 300 000	
Mgwenya-Ward 7	Reservoir	Res02 UAPUMGMKH01	Mkhambathini	R 1 808 400	
Mgwenya-Ward 7	Reservoir	Res01 UAPUMGMKH01	Mkhambathini	R 1 808 400	
Mgwenya-Ward 7	Reservoir	Res03 UAPUMGMKH01	Mkhambathini	R 1 808 400	
Mgwenya-Ward 7	Reservoir	Res04 UAPUMGMKH01	Mkhambathini	R 1 808 400	
Mgwenya-Ward 7	Bulk Line	MkhomaziRiver UAPUMGMKH01 01	Mkhambathini	R 42 309	
Mgwenya-Ward 7	Bulk Line	Pump01_UAPUMGMKH01	Mkhambathini	R 1 346 623	
Mgwenya-Ward 7	Bulk Line	Res02 UAPUMGMKH01	Mkhambathini	R 1 156 693	
Mgwenya-Ward 7	Bulk Line	Res02 UAPUMGMKH01	Mkhambathini	R 1 304 813	

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Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Mgwenya-Ward 7	Pump Station	Pump01_UAPUMGMKH01	Mkhambathini	R 967 045	
Mgwenya-Ward 7	WTW	MkhomaziRiver UAPUMGMKH01 ABWorks	Mkhambathini	R 35 000 000	
Mgwenya-Ward 7	Reticulation	RET_Mgwenya-Ward 7	Mkhambathini	R 18 940 433	
Mgwenya-Ward 7	Total				R 66 291 516
Esigodini-Ward 7	Borehole	Borehole 01 UAPUMGMKH02	Mkhambathini	R 300 000	
Esigodini-Ward 7	Borehole	Borehole 02 UAPUMGMKH02	Mkhambathini	R 300 000	
Esigodini-Ward 7	Reservoir	ExistingRes01 UAPUMGMKH02	Mkhambathini	R 2 197 636	
Esigodini-Ward 7	Bulk Line	Borehole 01 UAPUMGMKH02	Mkhambathini	R 500 799	
Esigodini-Ward 7	Bulk Line	Borehole 02 UAPUMGMKH02	Mkhambathini	R 181 551	
Esigodini-Ward 7	Reticulation	RET_Esigodini-Ward 7	Mkhambathini	R 1 391 994	
Esigodini-Ward 7	Total				R 4 871 980
Mgugu-Ward 5	Borehole	Borehole 01 UAPUMGMKH03	Mkhambathini	R 300 000	
Mgugu-Ward 5	Borehole	Borehole 02 UAPUMGMKH03	Mkhambathini	R 300 000	
Mgugu-Ward 5	Reservoir	Res01 UAPUMGMKH03	Mkhambathini	R 1 419 164	
Mgugu-Ward 5	Bulk Line	Borehole 01 UAPUMGMKH03	Mkhambathini	R 656 464	
Mgugu-Ward 5	Bulk Line	Borehole 02 UAPUMGMKH03	Mkhambathini	R 253 410	
Mgugu-Ward 5	Reticulation	RET_Mgugu-Ward 5	Mkhambathini	R 1 171 616	
Mgugu-Ward 5	Total				R 4 100 654
Simondi-Ward 6	Handpump	Borehole 01 UAPUMGMKH04	Mkhambathini	R 270 000	
Simondi-Ward 6	Handpump	Borehole 02 UAPUMGMKH04	Mkhambathini	R 270 000	
Simondi-Ward 6	Handpump	Borehole 03 UAPUMGMKH04	Mkhambathini	R 270 000	
Simondi-Ward 6	Handpump	Borehole 04 UAPUMGMKH04	Mkhambathini	R 270 000	
Simondi-Ward 6	Handpump	Borehole 05 UAPUMGMKH04	Mkhambathini	R 270 000	

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Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Simondi-Ward 6	Total				R 1 350 000
Mbila-Ward 6	Borehole	Borehole 01 UAPUMGMKH05	Mkhambathini	R 300 000	
Mbila-Ward 6	Borehole	Borehole 02 UAPUMGMKH05	Mkhambathini	R 300 000	
Mbila-Ward 6	Reservoir	Res01 UAPUMGMKH05	Mkhambathini	R 740 757	
Mbila-Ward 6	Reservoir	Res02 UAPUMGMKH05	Mkhambathini	R 740 757	
Mbila-Ward 6	Reservoir	Res03 UAPUMGMKH05	Mkhambathini	R 740 757	
Mbila-Ward 6	Bulk Line	Borehole 01 UAPUMGMKH05	Mkhambathini	R 620 951	
Mbila-Ward 6	Bulk Line	Borehole 02 UAPUMGMKH05	Mkhambathini	R 337 466	
Mbila-Ward 6	Bulk Line	Res01 UAPUMGMKH05	Mkhambathini	R 561 611	
Mbila-Ward 6	Bulk Line	Pump01_UAPUMGMKH05	Mkhambathini	R 191 181	
Mbila-Ward 6	Bulk Line	Pump01_UAPUMGMKH05	Mkhambathini	R 407 703	
Mbila-Ward 6	Pump Station	Pump01_UAPUMGMKH05	Mkhambathini	R 967 045	
Mbila-Ward 6	Reticulation	RET_Mbila-Ward 6	Mkhambathini	R 2 363 292	
Mbila-Ward 6	Total				R 8 271 520
Mpangisa-Ward 6	Handpump	Borehole 01 UAPUMGMKH06	Mkhambathini	R 270 000	
Mpangisa-Ward 6	Total				R 270 000
Mkhambathini NU-Ward 6	Borehole	Borehole 01 UAPUMGMKH07	Mkhambathini	R 300 000	
Mkhambathini NU-Ward 6	Borehole	Borehole 02 UAPUMGMKH07	Mkhambathini	R 300 000	
Mkhambathini NU-Ward 6	Reservoir	Res01 UAPUMGMKH07	Mkhambathini	R 567 752	
Mkhambathini NU-Ward 6	Bulk Line	Borehole 01 UAPUMGMKH07	Mkhambathini	R 163 561	
Mkhambathini NU-Ward 6	Bulk Line	Borehole 02 UAPUMGMKH07	Mkhambathini	R 146 289	
Mkhambathini NU-Ward 6	Reticulation	RET_Mkhambathini NU-Ward 6	Mkhambathini	R 591 041	
Mkhambathini NU-Ward 6	Total				R 2 068 644
Nagle-Ward 2	Dam Abstraction	NagleDam 01 UAPUMGMKH08	Mkhambathini	R 300 000	

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Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Nagle-Ward 2	Reservoir	Res01 UAPUMGMKH08	Mkhambathini	R 3 089 419	
Nagle-Ward 2	Bulk Line	Pump01_UAPUMGMKH08	Mkhambathini	R 1 117 210	
Nagle-Ward 2	Pump station	Pump01_UAPUMGMKH08	Mkhambathini	R 967 045	
Nagle-Ward 2	WTW	Nagle Dam 01 UAPUMGMKH08 ABWorks	Mkhambathini	R 17 500 000	
Nagle-Ward 2	Reticulation	RET_Nagle-Ward 2	Mkhambathini	R 9 189 470	
Nagle-Ward 2	Total				R 32 163 145
Ophokweni A-Ward 2	Borehole	Existing Borehole 01 UAPUMGMKH09	Mkhambathini	R 300 000	
Ophokweni A-Ward 2	Reservoir	ExistingRes01 UAPUMGMKH09	Mkhambathini	R 2 448 910	
Ophokweni A-Ward 2	Bulk Line	Existing Borehole 01 UAPUMGMKH09	Mkhambathini	R 420 878	
Ophokweni A-Ward 2	Reticulation	RET_Ophokweni A-Ward 2	Mkhambathini	R 1 267 915	
Ophokweni A-Ward 2	Total				R 4 437 703
Oqweqweni-Ward 2	River Abstraction	Msunduzi River 01 UAPUMGMKH10	Mkhambathini	R 300 000	
Oqweqweni-Ward 2	Reservoir	Res01 UAPUMGMKH10	Mkhambathini	R 2 677 374	
Oqweqweni-Ward 2	Bulk Line	Pump01_UAPUMGMKH10	Mkhambathini	R 367 380	
Oqweqweni-Ward 2	Pump station	Pump01_UAPUMGMKH10	Mkhambathini	R 967 045	
Oqweqweni-Ward 2	WTW	Msunduzi River 01 UAPUMGMKH08 ABWorks	Mkhambathini	R 14 000 000	
Oqweqweni-Ward 2	Reticulation	RET_Oqweqweni-Ward 2	Mkhambathini	R 7 324 720	
Oqweqweni-Ward 2	Total				R 25 636 519
Mkhambathini NU-Ward 3	Handpump	Borehole 01 UAPUMGMKH11	Mkhambathini	R 270 000	
Mkhambathini NU-Ward 3	Handpump	Borehole 02 UAPUMGMKH11	Mkhambathini	R 270 000	

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Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Mkhambathini NU-Ward 3	Handpump	Borehole 03 UAPUMGMKH11	Mkhambathini	R 270 000	
Mkhambathini NU-Ward 4	Borehole	Borehole 01 UAPUMGMKH12	Mkhambathini	R 300 000	
Mkhambathini NU-Ward 4	Borehole	Borehole 02 UAPUMGMKH12	Mkhambathini	R 300 000	
Mkhambathini NU-Ward 4	Reservoir	Res01 UAPUMGMKH12	Mkhambathini	R 1 717 897	
Mkhambathini NU-Ward 4	Bulk Line	Borehole 01 UAPUMGMKH12	Mkhambathini	R 351 600	
Mkhambathini NU-Ward 4	Bulk Line	Borehole 02 UAPUMGMKH12	Mkhambathini	R 243 428	
Mkhambathini NU-Ward 4	Reticulation	RET_Mkhambathini NU-Ward 4	Mkhambathini	R 1 489 170	
Mkhambathini NU-Ward 4	Total				R 5 212 095
Shayamoya-Ward 4	Handpump	Borehole 01 UAPUMGMKH13	Mkhambathini	R 270 000	
Shayamoya-Ward 4	Handpump	Borehole 01 UAPUMGMKH13	Mkhambathini	R 270 000	
Shayamoya-Ward 4	Handpump	Borehole 01 UAPUMGMKH13	Mkhambathini	R 270 000	
Shayamoya-Ward 4	Handpump	Borehole 01 UAPUMGMKH13	Mkhambathini	R 270 000	
Shayamoya-Ward 4	Total				R 1 080 000
Mpofana NU-Ward 4/1	Borehole	Borehole 01 UAPUMGMPO01	Mpofana	R 300 000	
Mpofana NU-Ward 4/1	Borehole	Borehole 02 UAPUMGMPO01	Mpofana	R 300 000	
Mpofana NU-Ward 4/1	Borehole	Borehole 03 UAPUMGMPO01	Mpofana	R 300 000	
Mpofana NU-Ward 4/1	Borehole	Borehole 04 UAPUMGMPO01	Mpofana	R 300 000	
Mpofana NU-Ward 4/1	Borehole	Borehole 05 UAPUMGMPO01	Mpofana	R 300 000	
Mpofana NU-Ward 4/1	Borehole	Borehole 06 UAPUMGMPO01	Mpofana	R 300 000	
Mpofana NU-Ward 4/1	Borehole	Borehole 07 UAPUMGMPO01	Mpofana	R 300 000	
Mpofana NU-Ward 4/1	Borehole	Borehole 08 UAPUMGMPO01	Mpofana	R 300 000	
Mpofana NU-Ward 4/1	Reservoir	Res01 UAPUMGMPO01	Mpofana	R 432 519	
Mpofana NU-Ward 4/1	Reservoir	Res02 UAPUMGMPO01	Mpofana	R 432 519	
Mpofana NU-Ward 4/1	Reservoir	Res03 UAPUMGMPO01	Mpofana	R 432 519	

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Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Mpofana NU-Ward 4/1	Reservoir	Res04 UAPUMGMPO01	Mpofana	R 432 519	
Mpofana NU-Ward 4/1	Reservoir	Res05 UAPUMGMPO01	Mpofana	R 432 519	
Mpofana NU-Ward 4/1	Bulk Line	Borehole 07 UAPUMGMPO01	Mpofana	R 760 808	
Mpofana NU-Ward 4/1	Bulk Line	Borehole 02 UAPUMGMPO01	Mpofana	R 425 995	
Mpofana NU-Ward 4/1	Bulk Line	Borehole 01 UAPUMGMPO01	Mpofana	R 448 862	
Mpofana NU-Ward 4/1	Bulk Line	Borehole 08 UAPUMGMPO01	Mpofana	R 356 540	
Mpofana NU-Ward 4/1	Bulk Line	Res04 UAPUMGMPO01	Mpofana	R 620 099	
Mpofana NU-Ward 4/1	Bulk Line	Borehole 06 UAPUMGMPO01	Mpofana	R 217 381	
Mpofana NU-Ward 4/1	Bulk Line	Borehole 05 UAPUMGMPO01	Mpofana	R 237 501	
Mpofana NU-Ward 4/1	Bulk Line	Borehole 04 UAPUMGMPO01	Mpofana	R 198 598	
Mpofana NU-Ward 4/1	Bulk Line	Borehole 03 UAPUMGMPO01	Mpofana	R 556 676	
Mpofana NU-Ward 4/1	Pump Station	Pump01_UAPUMGMPO01	Mpofana	R 967 045	
Mpofana NU-Ward 4/1	Reticulation	RET_Mpofana NU-Ward 4/1	Mpofana	R 3 740 840	
Mpofana NU-Ward 4/1	Total				R 13 092 939
Mpofana NU-Ward 2/1	Borehole	Borehole 01 UAPUMGMPO02	Mpofana	R 300 000	
Mpofana NU-Ward 2/1	Borehole	Borehole 02 UAPUMGMPO02	Mpofana	R 300 000	
Mpofana NU-Ward 2/1	Borehole	Borehole 03 UAPUMGMPO02	Mpofana	R 300 000	
Mpofana NU-Ward 2/1	Reservoir	Res01 UAPUMGMPO02	Mpofana	R 432 519	
Mpofana NU-Ward 2/1	Reservoir	Res01 UAPUMGMPO02	Mpofana	R 432 519	
Mpofana NU-Ward 2/1	Bulk Line	Res01 UAPUMGMPO02	Mpofana	R 617 888	
Mpofana NU-Ward 2/1	Bulk Line	Borehole 01 UAPUMGMPO02	Mpofana	R 270 653	
Mpofana NU-Ward 2/1	Bulk Line	Borehole 02 UAPUMGMPO02	Mpofana	R 136 159	
Mpofana NU-Ward 2/1	Bulk Line	Borehole 03 UAPUMGMPO02	Mpofana	R 197 427	
Mpofana NU-Ward 2/1	Bulk Line	Pump01_UAPUMGMPO02	Mpofana	R 708 676	

Development of UAP for Water & Sanitation in Kwazulu-Natal

Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Mpofana NU-Ward 2/1	Pump Station	Pump01_UAPUMGMPO02	Mpofana	R 967 045	
Mpofana NU-Ward 2/1	Reticulation	RET_Mpofana NU-Ward 2/1	Mpofana	R 1 865 154	
Mpofana NU-Ward 2/1	Total				R 6 528 040
Mpofana NU-Ward 2/2	Borehole	Borehole 01 UAPUMGMPO03	Mpofana	R 300 000	
Mpofana NU-Ward 2/2	Borehole	Borehole 02 UAPUMGMPO03	Mpofana	R 300 000	
Mpofana NU-Ward 2/2	Borehole	Borehole 03 UAPUMGMPO03	Mpofana	R 300 000	
Mpofana NU-Ward 2/2	Reservoir	Res01 UAPUMGMPO03	Mpofana	R 432 519	
Mpofana NU-Ward 2/2	Bulk Line	Borehole 01 UAPUMGMPO03	Mpofana	R 352 885	
Mpofana NU-Ward 2/2	Bulk Line	Borehole 03 UAPUMGMPO03	Mpofana	R 241 273	
Mpofana NU-Ward 2/2	Bulk Line	Borehole 02 UAPUMGMPO03	Mpofana	R 629 537	
Mpofana NU-Ward 2/2	Reticulation	RET_Mpofana NU-Ward 2/2	Mpofana	R 1 022 486	
Mpofana NU-Ward 2/2	Total				R 3 578 700
Mpofana NU-Ward 4/2	Borehole	Borehole 01 UAPUMGMPO04	Mpofana	R 300 000	
Mpofana NU-Ward 4/2	Borehole	Borehole 02 UAPUMGMPO04	Mpofana	R 300 000	
Mpofana NU-Ward 4/2	Borehole	Borehole 03 UAPUMGMPO04	Mpofana	R 300 000	
Mpofana NU-Ward 4/2	Reservoir	Res01 UAPUMGMPO04	Mpofana	R 432 519	
Mpofana NU-Ward 4/2	Bulk Line	Borehole 01 UAPUMGMPO04	Mpofana	R 396 173	
Mpofana NU-Ward 4/2	Bulk Line	Borehole 02 UAPUMGMPO04	Mpofana	R 478 159	
Mpofana NU-Ward 4/2	Bulk Line	Borehole 03 UAPUMGMPO04	Mpofana	R 1 442 734	
Mpofana NU-Ward 4/2	Reticulation	RET_Mpofana NU-Ward 4/2	Mpofana	R 1 459 834	
Mpofana NU-Ward 4/2	Total				R 5 109 418
Mpofana NU-Ward 4/3	Borehole	Borehole 01 UAPUMGMPO05	Mpofana	R 300 000	
Mpofana NU-Ward 4/3	Borehole	Borehole 02 UAPUMGMPO05	Mpofana	R 300 000	
Mpofana NU-Ward 4/3	Reservoir	Res01 UAPUMGMPO05	Mpofana	R 432 519	

Development of UAP for Water & Sanitation in Kwazulu-Natal



Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Mpofana NU-Ward 4/3	Bulk Line	Borehole 01 UAPUMGMPO05	Mpofana	R 185 257	
Mpofana NU-Ward 4/3	Bulk Line	Borehole 02 UAPUMGMPO05	Mpofana	R 105 761	
Mpofana NU-Ward 4/3	Reticulation	RET_Mpofana NU-Ward 4/3	Mpofana	R 529 415	
Mpofana NU-Ward 4/3	Total				R 1 852 952
Edendale-Ward 11	Borehole	Borehole 01 UAPUMGMSD01	The Msunduzi	R 300 000	
Edendale-Ward 11	Borehole	Borehole 02 UAPUMGMSD01	The Msunduzi	R 300 000	
Edendale-Ward 11	Reservoir	Res01 UAPUMGMSD01	The Msunduzi	R 824 662	
Edendale-Ward 11	Bulk Line	Borehole 01 UAPUMGMSD01	The Msunduzi	R 39 961	
Edendale-Ward 11	Bulk Line	Borehole 02 UAPUMGMSD01	The Msunduzi	R 319 353	
Edendale-Ward 11	Reticulation	RET_Edendale-Ward 11	The Msunduzi	R 713 590	
Edendale-Ward 11	Total				R 2 497 566
Richmond NU-Ward 6/1	Borehole	Borehole 01 UAPUMGRIC01	Richmond	R 300 000	
Richmond NU-Ward 6/1	Borehole	Borehole 02 UAPUMGRIC01	Richmond	R 300 000	
Richmond NU-Ward 6/1	Reservoir	Res01 UAPUMGRIC01	Richmond	R 567 752	
Richmond NU-Ward 6/1	Bulk Line	Borehole 01 UAPUMGRIC01	Richmond	R 247 824	
Richmond NU-Ward 6/1	Bulk Line	Borehole 02 UAPUMGRIC01	Richmond	R 254 452	
Richmond NU-Ward 6/1	Reticulation	RET_Richmond NU-Ward 6/1	Richmond	R 668 011	
Richmond NU-Ward 6/1	Total				R 2 338 037
Richmond NU-Ward 6/2	Borehole	Borehole 01 UAPUMGRIC02	Richmond	R 300 000	
Richmond NU-Ward 6/2	Borehole	Borehole 02 UAPUMGRIC02	Richmond	R 300 000	
Richmond NU-Ward 6/2	Reservoir	Res01 UAPUMGRIC02	Richmond	R 478 652	
Richmond NU-Ward 6/2	Bulk Line	Borehole 01 UAPUMGRIC02	Richmond	R 201 409	
Richmond NU-Ward 6/2	Bulk Line	Borehole 02 UAPUMGRIC02	Richmond	R 234 084	
Richmond NU-Ward 6/2	Reticulation	RET_Richmond NU-Ward 6/2	Richmond	R 605 658	

Development of UAP for Water & Sanitation in Kwazulu-Natal



Scheme Name	Type	Name	Local Municipality	Infrastructure Cost	Total Cost
Richmond NU-Ward 6/2	Total				R 2 119 802
Richmond NU-Ward 6/3	Borehole	Borehole 01 UAPUMGRIC03	Richmond	R 300 000	
Richmond NU-Ward 6/3	Borehole	Borehole 02 UAPUMGRIC03	Richmond	R 300 000	
Richmond NU-Ward 6/3	Reservoir	Res01 UAPUMGRIC03	Richmond	R 1 717 897	
Richmond NU-Ward 6/3	Bulk Line	Borehole 01 UAPUMGRIC03	Richmond	R 506 472	
Richmond NU-Ward 6/3	Bulk Line	Borehole 02 UAPUMGRIC03	Richmond	R 489 496	
Richmond NU-Ward 6/3	Reticulation	RET_Richmond NU-Ward 6/3	Richmond	R 1 325 546	
Richmond NU-Ward 6/3	Total				R 4 639 412
UMGUNGUNDLOVU UNIVERSAL ACCESS PLAN					R 224 115 757

10 RECOMMENDATIONS

The following recommendation needs to be considered as these are likely to impact the water and sanitation services provisions in uMgungundlovu:

- The conceptual bulk schemes identified in this report should be used to form a basis for further investigations to address the current backlogs, pre-feasibilities and feasibility studies must be undertaken.
- Plans should be put in place to prevent illegal connections to water supply. Vandalism of water connections causes strain on the infrastructure whereby preventing the proposed extent of water supply to be met.
- The rivers and dams in the District must be considered as a source for water backlogged areas, and a feasibility study should be carried out to determine water quality and yield from them.
- A fully comprehensive GIS exercise should be carried out to identify all ground structures including bulk lines. GIS data collected during the Delphi Sessions would be a good starting point as data available within this newly created GIS could be used as a base from which to compile an updated Geodatabase.
- Water and sanitation attributes captured in this project must be confirmed on site and updated on the Geographic Information System (GIS). This will ensure that better planning could be completed and more accurate and realistic costing could be achieved.
- Water and sanitation services backlogs needs to be reviewed on an annual basis to ensure that:-
 - The water services programme aligns with the available funding;
 - Equitable allocation of funding is applied;
 - Monitor progress of the planning;
 - Enable future planning.
- Although the focus may be on addressing the backlogs to those in need, uMgungundlovu should also prioritise the maintenance of the existing infrastructure by introducing an asset management programme with appropriate budget.
- Water Service Authority must ensure that water and sanitation infrastructure must be aligned to the requirements of the Water Service Master Planning and Water Services Development Plan (WSDP) document.

- Alternate sources of funding are needed to be secured in order to expedite service delivery and address the current backlogs. The current budget will not be able to address all the backlogs hence it is important for alternative funding models to be investigated.
- The projects listed in the Integrated Development Plan should be updated in terms of current progress and funding required for the completion of them.

11 CONCLUSIONS

Funding models must be investigated in order to address these backlogs. Planning of regional and bulk schemes is the first steps but without funding these can be implemented. uMgungundlovu together with other stakeholders must conduct feasibility studies in order to accurately determine and quantify the cost and suitability of bulk and regional schemes.

The current backlogs for both water and sanitation identified at the engagement meeting with the District municipality are vastly different to the 2011 Census data. Hence it is important that these figures are confirmed through physical verification on site and could be incorporated in an asset management programme. This will identify current infrastructure for both water and sanitation hence from this assessment the backlogs could be more accurately quantified.

The short term schemes identified in the report are conceptual designs and are based on inputs from the operational staff at the engagement meeting. It is important that all water and sanitation infrastructure are confirmed through asset management programmes which will determine and confirm this infrastructure. This confirmation of infrastructure can be used for better water and sanitation planning and will update the current GIS database.

uMgungundlovu should also prioritise the maintenance of the existing infrastructure by introducing an asset management programme with appropriate budget. Without maintenance and lack of maintenance could lead to an increase in backlogs numbers hence it is crucial that a maintenance budget set aside every year to maintain its current infrastructure.

The findings of this report and the GIS information collected should be used for future planning and decision making and must be further investigated through feasibility studies and must not be read in isolation from other studies undertaken in the uMgungundlovu District Municipality or other Water Authorities such as Umgeni Water and Department of Water Affairs.

The projects listed in the Integrated Development Plan and those set out by DWA which are shown in Annexure A and D are regional bulk schemes which are long term solutions to address backlogs and improve current water and sanitation infrastructure. These projects have are funded through the Municipal Infrastructure Grant and Municipal Water Infrastructure Grant which we have not considered when proposing conceptual alternate schemes to eradicate current backlogs. There could be overlapping of the proposed conceptual schemes to the

regional bulk schemes and thus overlapping of infrastructure costs. The main reason that infrastructure cost could be overlapped is due to our mandate to develop conceptual schemes to eradicate the backlogs identified at the engagement meeting with the district municipalities.

Annexure A

uMgungundlovu District Municipality

DWA Priority Actions Plans

PRJNR (MWIG Project Number)	Project Origin	LM	Project Name	Project Description	Project Status	Type of Intervention	Total Project Cost	Short Term Actions	Short Term Fund Requirement	Medium Term Actions	Medium Term Funding Requirement	Long Term Actions	Long Term Funding Requirement
2012MIG FDC2220 7567	MIG	uMshwathi	uMshwathi Regional Bulk Water Supply Scheme (Planning Phase & Primary Bulk)	The purpose of this study is to investigate the options of a regional water supply scheme in the uMshwathi LM of uMgungundlovu DM. A number of small towns and large rural communities that are in need of secure water service. A portion of the area is currently supplied with bulk water by Umgeni Water. Recent water demand growth has placed a strain on the existing infrastructure with a number of interruptions of water supply in the area. The total estimated population to be served is 324,433 in 47,405 households.	Awaiting Funding	Feasibility	790 000 000	-	-	-	-	-	-
ZKZNUM GUN01	23DM	uMshwathi	uMshwathi Regional Bulk Water Supply Scheme - Construction	The project involves the construction of Secondary Bulk Water Supply Infrastructure namely: Construction of pipelines (SBL1 to SBL7), Booster Pump Station (Booster to Montebello) and secondary bulk water storage reservoirs (SBR1 to SBR16)	Awaiting Funding	Construction of 94,5 km pipelines, 46, Booster Pump Stations, Reservoirs 46,3 ML	309 540 602	Detail design	1 877 880	Design and Tender	23 765 840	Implementation	33 182 753
2012MIG FDC2220 6847	MIG	Umngeni	Impendle LM Bulk Water Supply Scheme	This project falls within Impendle LM under uMgungundlovu DM. The objective of this project is to provide a safe and reliable source of potable water in the Impendle LM area and to augment and feed into existing and proposed water schemes. There are currently nine stand-alone schemes in the area but the water sources (river abstractions and boreholes) are not reliable and are reported to dry out during certain dry periods of the year. The multiple stand-alone schemes are proving difficult to operate and maintain. The works proposed to provide reliable bulk water supply will involve the construction of Two river abstraction works; Water treatment plant with a combined production of 5.28ML/day; Approximately 62km of steel and uPVC pipeline (diameter varying from 300mm to 75mm); Reservoirs of various capacities (50KL to 1200KL); 6 Pump Stations. This project will serve a total of 67,726 people living in 6,177 households.	Planning	Construction	19 268 090	-	-	-	-	-	-
ZKZNUM GUN02	23DM	Umngeni	Impendle LM Bulk Water Supply Scheme	This project falls within Impendle LM under uMgungundlovu DM. The objective of this project is to provide a safe and reliable source of potable water in the Impendle LM area and to augment and feed into existing and proposed water schemes. There are currently nine stand-alone schemes in the area but the water sources (river abstractions and boreholes) are not reliable and are reported to dry out during certain dry periods of the year. The multiple stand-alone schemes are proving difficult to operate and maintain. The works proposed to provide reliable bulk water supply will involve the construction of Two river abstraction works; Water treatment plant with a combined production of 5.28ML/day; Approximately	Feasibility	Fast track MIG project . Two river extraction plants, new WTW 5,3 ML/Day, Pipelines & 6 pump stations	188 370 825	Tender	2 825 652	Construction	29 195 833	Construction	40 318 056

PRJNR (MWIG)	Project Origin	LM	Project Name	Project Description	Project Status	Type of Intervention	Total Project Cost	Short Term	Short Term Fund	Medium Term	Medium Term Funding	Long Term Actions	Long Term Funding
				62km of steel and uPVC pipeline (diameter varying from 300mm to 75mm); Reservoirs of various capacities (50KL to 1200KL); 6 Pump Stations. This project will serve a total of 67,726 people living in 6,177 households.									
2006MIG FDC2211 3499-KNR006	MIG	Mkhambathini	Greater Eston Water Supply - Construction Phase	This project covers 81 villages pop. 36334/ it is a construction of reservoirs, 129 km of distribution and reticulation lines	Construction	Construction of new reservoir and water supply pipelines	310 434 377	-	-	-	-	-	-
2007MIG FDC2212 4195	MIG	Impendle	Kwanovuka Water Supply - Construction Phase	The four villages of KwaNovuka presently obtain water from a combination of streams and springs, some of which linked to an informal reticulation system implemented by the local church. This project aims to formalise water supply requirements for the community using production boreholes. The proposed new infrastructure consists of two production boreholes, protection of two springs, rising mains from boreholes, reservoirs, 14.5 km of reticulation pipelines and 36 standpipes. The total number of population to be served is 3048 with 508 total number of households.	Construction	Construction of two boreholes, reservoirs, 14,5 km reticulation & 36 standpipes	45 581 392	-	-	-	-	-	-
2007MIG FDC2212 9684	MIG	Impendle	Enguga, Entshayabantu and Macksam Water Supply - Construction Phase	The proposed project falls within the Impendle Local Municipality, covering approximately 53.2km square and will serve 15 120 beneficiaries residing in 1 890 households. Currently, distant traditional resources utilised to obtain are either from unreliable boreholes, rivers or streams. In order to alleviate the existing circumstances, water will be abstracted from the Nzinga River and two boreholes will act as backup or supplementary supply.	Construction	Construction of new boreholes & associated infrastructure	55 460 930	-	-	-	-	-	-
2009MIG FDC2217 1839	MIG	Richmond	Gengeshe Water - Planning Phase	The project application outlines the funding support for the preparation of a business plan/feasibility study and water project implementation plan to deliver water services to Gengeshe area within Ward 3 of Richmond Local Municipality of the uMgungundlovu District Municipality area. The area has an estimated 1081 households (8,650 people). The scope of works includes; Preliminary design (Geo-hydrological and Geo-technical investigations), Business Plan preparation, Planning and feasibility studies.	Planning	Feasibility Study & Project Implementation Plan	486 450	-	-	-	-	-	-
2009MIG FDC2217 1841	MIG	Mpofana	Muden Water - Planning Phase	The project application outlines the funding support for the preparation of a business plan/feasibility study and water project implementation plan to deliver water services to Muden area within Ward 4 of Mpofana Local Municipality of the uMgungundlovu District Municipality area. The area has an estimated 3,429 households (27,432	Planning	Feasibility Study & Project Implementation Plan	1 549 500	-	-	-	-	-	-

PRJNR (MWIG)	Project Origin	LM	Project Name	Project Description	Project Status	Type of Intervention	Total Project Cost	Short Term	Short Term Fund	Medium Term	Medium Term Funding	Long Term Actions	Long Term Funding
				people). The scope of works includes; Preliminary design (Geo-hydrological and Geo-technical investigations), Business Plan preparation, Planning and feasibility studies.									
2009MIG FDC2217 1854	MIG	uMshwathi	Greater Efaye Water - Planning Phase	The project application outlines the funding support requirements for the preparation of a business plan/feasibility study and water project implementation plan to deliver water services to Greater Efaye area within ward 3 of uMshwathi Local Municipality of the uMgungundlovu DM area. The area has an estimated 3,000 households (24,000 people). The scope of works includes: Preliminary design; Geo-hydrological and Geo-technical Investigation; Business Plan preparation and Planning and Feasibility	Planning	Feasibility Study & Project Implementation Plan	1 350 000	-	-	-	-	-	-
2009MIG FDC2217 1834	MIG	Richmond	Ephatheni Water Supply -	The project application outlines the funding support requirements for the preparation of a business plan/feasibility study and water project implementation plan to deliver water services to Phatheni Area within ward 6 of the Richmond Local Municipality of the uMgungundlovu District Municipality area. The area has an estimated 1.257 households (10,056 people). The scope of works includes Preliminary design, Geo-hydrological and Geo-technical Investigations, Business Plan Preparation, Planning and Feasibility Studies.	Planning	Feasibility Study & Project Implementation Plan	59 233 935	-	-	-	-	-	-
2011MIG FDC2220 1709	MIG	Impendle	Smilobha, Phindangene, Ntokozweni, Lindokuhle and Fikesuthi Water Supply Scheme -	The project entails provision of basic water to the following areas; Smilobha, Phindangene, Ntokozweni, Lindokuhle & Fikesuthi. The proposed project falls within the uMgungundlovu DM area and is located at ward 3 of Impendle Local Municipality. Funding that is required to do ground & surface water investigation and project feasibility study is estimated at R600,000. The estimated population to be served is 700 households (5,600 people).	Planning	Business Plan & Preliminary Design	26 025 120	-	-	-	-	-	-
2011MIG FDC2220 3771	MIG	Impendle	KwaChief, Enguga, Mashingeni, KwaHaza, KwaNxamalala Water Supply Scheme	The project entails provision of basic water to the following areas; Smilobha, Phindangene, Ntokozweni, Lindokuhle & Fikesuthi. The proposed project falls within the uMgungundlovu DM area and is located at ward 3 of Impendle Local Municipality. Funding that is required to do ground & surface water investigation and project feasibility study is estimated at R600,000. The estimated population to be served is 700 households (5,600 people).	Planning	Business Plan & Preliminary Design	250 000	-	-	-	-	-	-
2012MIG FDC2220 5725	MIG	Mkhambathini	Maqongqo Bulk and Reticulation Water Supply Project -	The Maqongqo Bulk and Reticulation project lies in the Mkhambathini LM which forms part of the uMgungundlovu DM. The aim of this project is to provide the Maqongqo community with a reliable supply of potable water. The scope of works includes: Construction of a 2ML reinforced concrete reservoir adjacent to existing Maqongqo terminal reservoir; Construction of a 15.1km	Planning	Construction of 2ML Res & 111 km reticulation	67 410 238	-	-	-	-	-	-

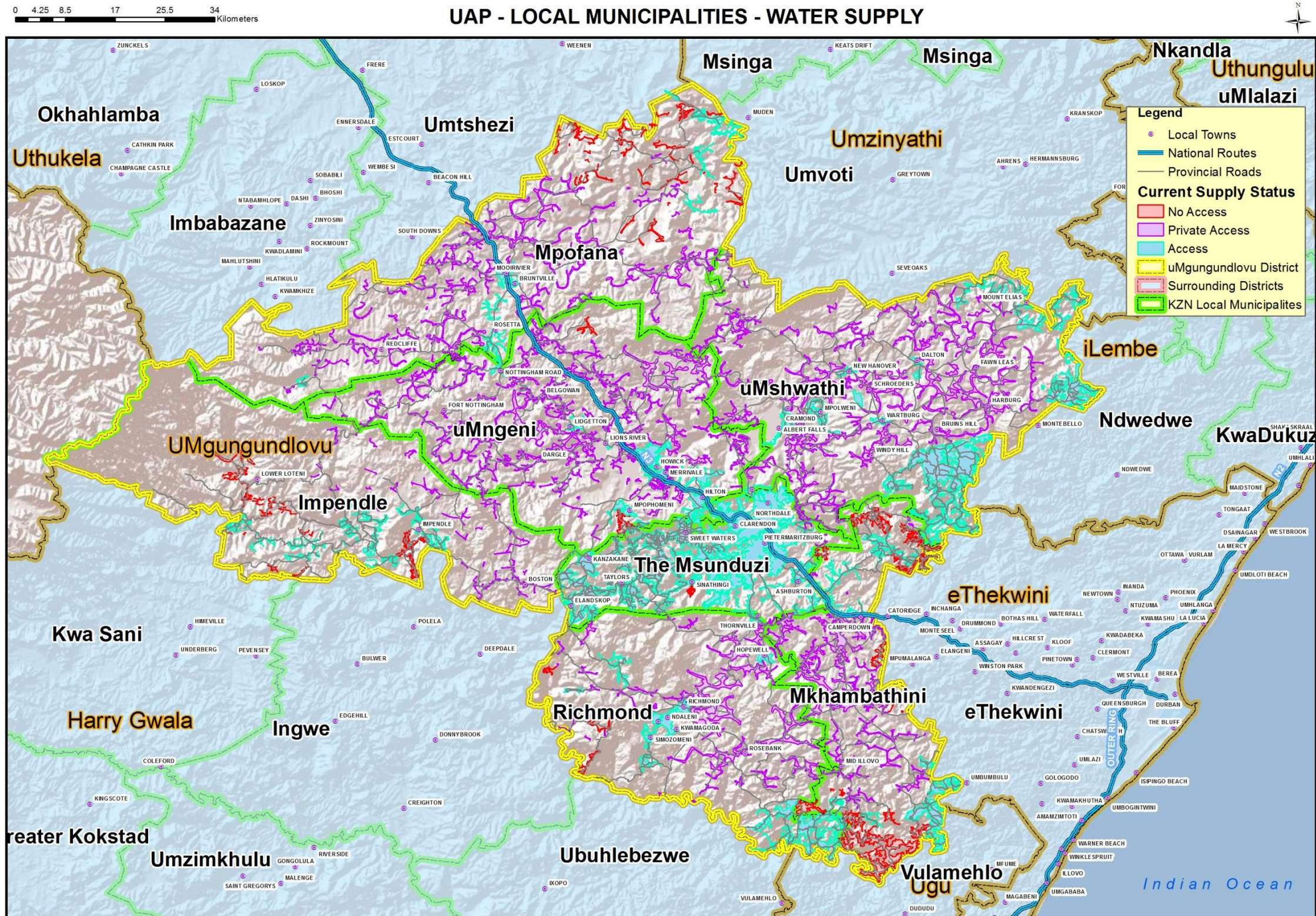
PRJNR (MWIG)	Project Origin	LM	Project Name	Project Description	Project Status	Type of Intervention	Total Project Cost	Short Term	Short Term Fund	Medium Term	Medium Term Funding	Long Term Actions	Long Term Funding
				of 250mm bulk pipeline from lower Glynn reservoir to Maqongqo terminal reservoir; 111km of internal reticulation. This project will serve 13,859 people in 1,978 homes and will be complete by October 2014. The water supply for this project is from DV Harris works to Table Mountain Intermediate reservoir and Umgeni Water have confirmed that there is sufficient capacity.									
2012MIG FDC2220 6689	MIG	Umshwathi	Mbhava and Mpethu Water Supply Project	Mbhava and Mpethu Water Supply project is located in the area known as Swayimane in the uMgungundlovu DM and consist of four wards which are wards 6,9,10 and 11. The area has a population of approximately 690 people and 115 households which will be supplied by this project. The aim of this project is to supply the Mbhava and Mpethu community with a portable water system. The scope of works is as follows: - 2 Pump Stations - 2 break pressure tanks - 10kl and 30kl reservoirs - 1 x 50mm and 6 x 25mm pressure reducing valves - 21 stand pipes - 32mm to 75mm diameter HDPE - 110mm diameter mPVC etc.	Planning	Construction of two pump stations	10 163 099	-	-	-	-	-	-
2012MIG FDC2220 7742	MIG	uMshwathi	Hilton Corridor Development - Planning phase	The development of the N3 Hilton Corridor is underway with a number of commercial developments planned within the uMgeni Local Municipality, uMgungundlovu DM. The purpose is to cater in terms of water and wastewater services. The study area covers the corridor from Hilton towards the N3 and beyond towards the Hilton College and along the N3 towards Cedara. The investigation will include options from bulk potable supply from existing systems where possible and waste water treatment and disposal that will cater for the region including sections of Hilton that currently use septic tanks. The total population to be served is 5,000. Total number of households is 1,367	Planning	Feasibility Study - Regional Water Supply Scheme	4 249 806	-	-	-	-	-	-
2012MIG FDC2220 7565	MIG	Impendle	Lindokuhle / Mpolweni Water Supply - Planning	The purpose of the study is to provide a safe drinking and reliable source of water to Mpolweni, Lindokuhle, Newtown Ext and Esihlabathini settlements, within the uMshwathi LM, uMgungundlovu DM. The study area is sparsely to semi-densely populated with gentle to rolling terrain. The settlements are predominantly a low income community that requires the formalization and expansion of the existing reticulation infrastructure in order to cater for the water demands. The community currently receives water from Mpolweni Rural Water Supply Scheme via 400kl reservoirs receiving water from the Wartburg Booster Pump Station. However, this current reticulation network does not satisfy the demand and it is likely	Planning	Expansion fo the existing water supply scheme	471 127	-	-	-	-	-	-

PRJNR (MWIG)	Project Origin	LM	Project Name	Project Description	Project Status	Type of Intervention	Total Project Cost	Short Term	Short Term Fund	Medium Term	Medium Term Funding	Long Term Actions	Long Term Funding
				that future densification will increase the strain on the existing scheme. The study will assess the existing infrastructure and constructing the new infrastructure is required.									
ZKZNUM GUN09	Other	Umngeni	KwaHaza - Additional 75mm PVC bulk pipeline required from Vulindlela reservoir to KwaHaza.	Construction of upgraded bulk water supply infrastructure (pipeline from Vulindlele res to Kwahuza)	Design	Construction of upgraded bulk water supply infrastructure (pipeline from Vulindlele res to Kwahuza)	23 000 000	-	-	Design & Tender	6 000 000	Construction	17 000 000
ZKZNUM GUN07	23DM	Mkhambathini	Maqongqo - construction of upgraded bulk water supply infrastructure & new internal water reticulation networks - construction stage	Construction of a new water reticulation and upgrade of existing bulk water infrastructure	Construction	Construction of upgraded bulk water supply infrastructure & new internal water reticulation networks	67 410 626	Construction	8 426 328	Construction	17 203 754	Construction	20 890 272
ZKZNUM GUN06	23DM	Richmond	Ephatheni, Endaleni & Smozomeni - construction of upgraded bulk water supply infrastructure & new internal water reticulation networks - tender stage	Construction of a new water reticulation and upgrade of existing bulk water infrastructure	Tender	Construction of upgraded bulk water supply infrastructure & new internal water reticulation networks	59 233 935	Design	888 509	Construction	18 564 454	Construction	21 698 712
ZKZNUM GUN05	Other	Richmond	Richmond Town & Surroundings - construction of bulk sanitation infrastructure - design stage	Upgrade of WWTW, Sewer AC Pipe Replacement and Sewer Reticulation Extension.	Design	Construction of bulk sanitation infrastructure	237 298 698	Design	5 932 467	Design & Tender	9 491 948	Construction	73 958 094
ZKZNUM GUN03	Other	uMngeni	Mpophomeni - construction of bulk sanitation infrastructure - design stage	Construction of a 6ML WWTW & Sewer Reticulation	Design	Construction of bulk sanitation infrastructure	154 000 000	Design & Tender	3 850 000	Construction	29 195 833	Construction	40 318 056
ZKZNUM GUN04	Other	Mpofana	Mooi Rivier - construction of bulk sanitation infrastructure - feasibility stage	Construction of a 6ML WWTW & Sewer Reticulation	Feasibility	Construction of bulk sanitation infrastructure	120 000 000	Feasibility	3 000 000	Design & Tender	4 800 000	Construction	51 784 615

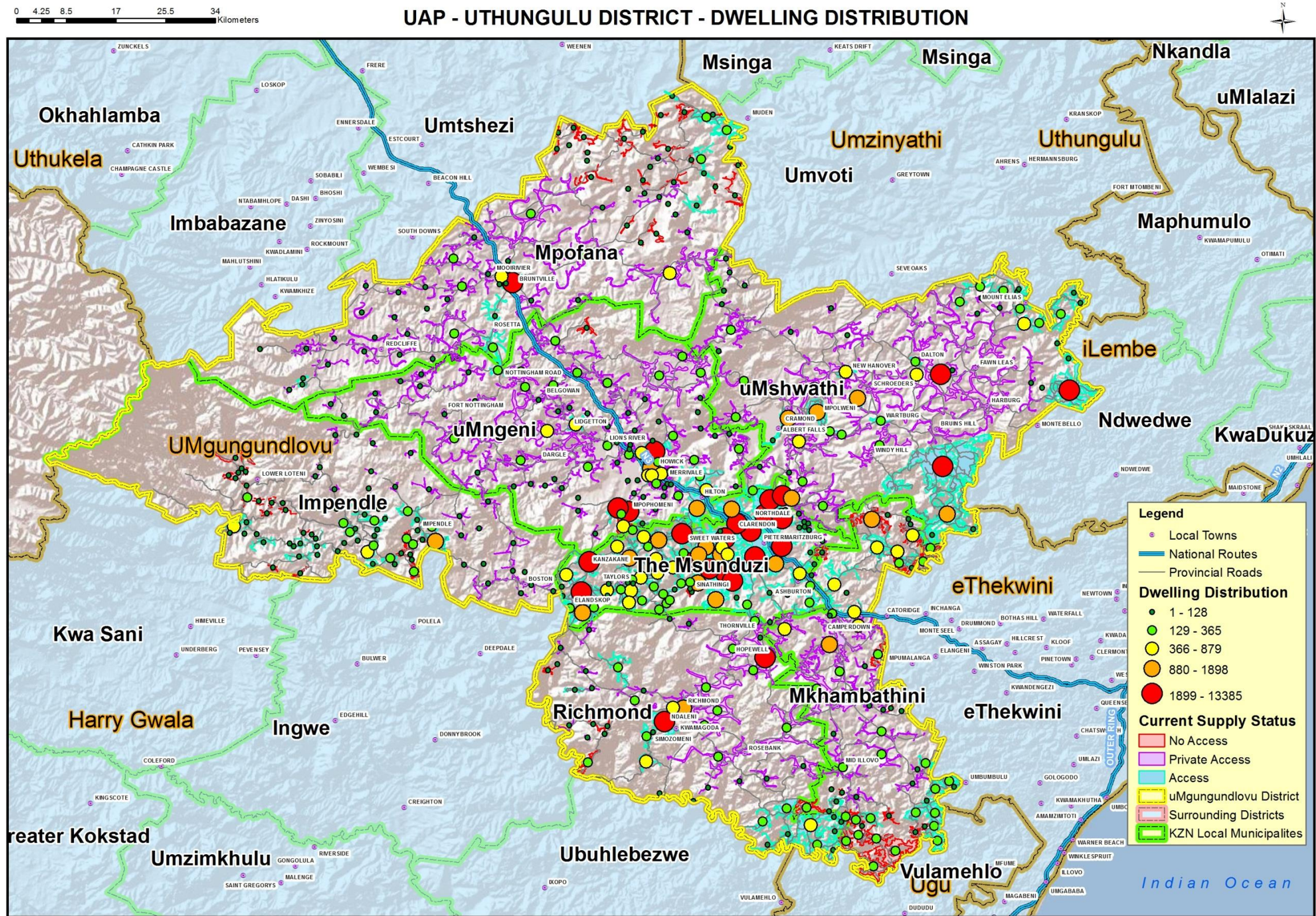
PRJNR (MWIG)	Project Origin	LM	Project Name	Project Description	Project Status	Type of Intervention	Total Project Cost	Short Term	Short Term Fund	Medium Term	Medium Term Funding	Long Term Actions	Long Term Funding
ZKZNUM GUN08	23DM	Mpofana	Muden - construction of new bulk water supply infrastructure - feasibility stage	Construction of a new water reticulation and bulk water infrastructure	Feasibility	Construction of new bulk water supply infrastructure	500 000 000	Conceptual	2 500 000	Feasibility & Design	12 500 000	Design & Tender	20 000 000
ZKZNUM GUN10	Other	Umshwathi	Mpethu in Swayimane - New Water Reticulation Scheme for the area	Construction of a new water reticulation network	Construction	Construction of new internal water reticulation network	11 000 000	Construction	2 000 000	Construction	9 000 000	-	-
KN_BA_108	Other	Richmond	Richmond Town & Surrounds - 2 x new bulk storage reservoirs (1 Megalitre each)	Construction of two new 1 ML storage reservoirs	Conceptual	Construction of two new 1 ML storage reservoirs	8 000 000	-	-	Feasibility & Design	-	Tender & Construction	-
KN_BA_132	Other	Richmond	Ward 3 - Upgrade, refurbishment & maintenance to stand alone rural water schemes scattered througho*	Refurbishment of existing rural "stand alone" water scheme	Conceptual	Refurbishment of existing rural "stand alone" water scheme	7 000 000	-	-	Feasibility & Design	-	Tender & Construction	-
		uMshwathi					1 126 303 507	-	3 877 880	-	32 765 840	-	33 182 753
		Umgeni					384 638 915	-	6 675 652	-	64 391 666	-	97 636 112
		Mkhambathini					445 255 241	-	8 426 328	-	17 203 754	-	20 890 272
		Umgungundlovu					-	-	-	-	-	-	-
		Richmond					371 253 018	-	6 820 976	-	28 056 402	-	95 656 806
		Mkhambathini					445 255 241	-	8 426 328	-	17 203 754	-	20 890 272
		Mpofana					621 549 500	-	5 500 000	-	17 300 000	-	71 784 615
Totals							3 394 255 422	-	30 349 284	-	126 855 576	-	340 040 830

Annexure B

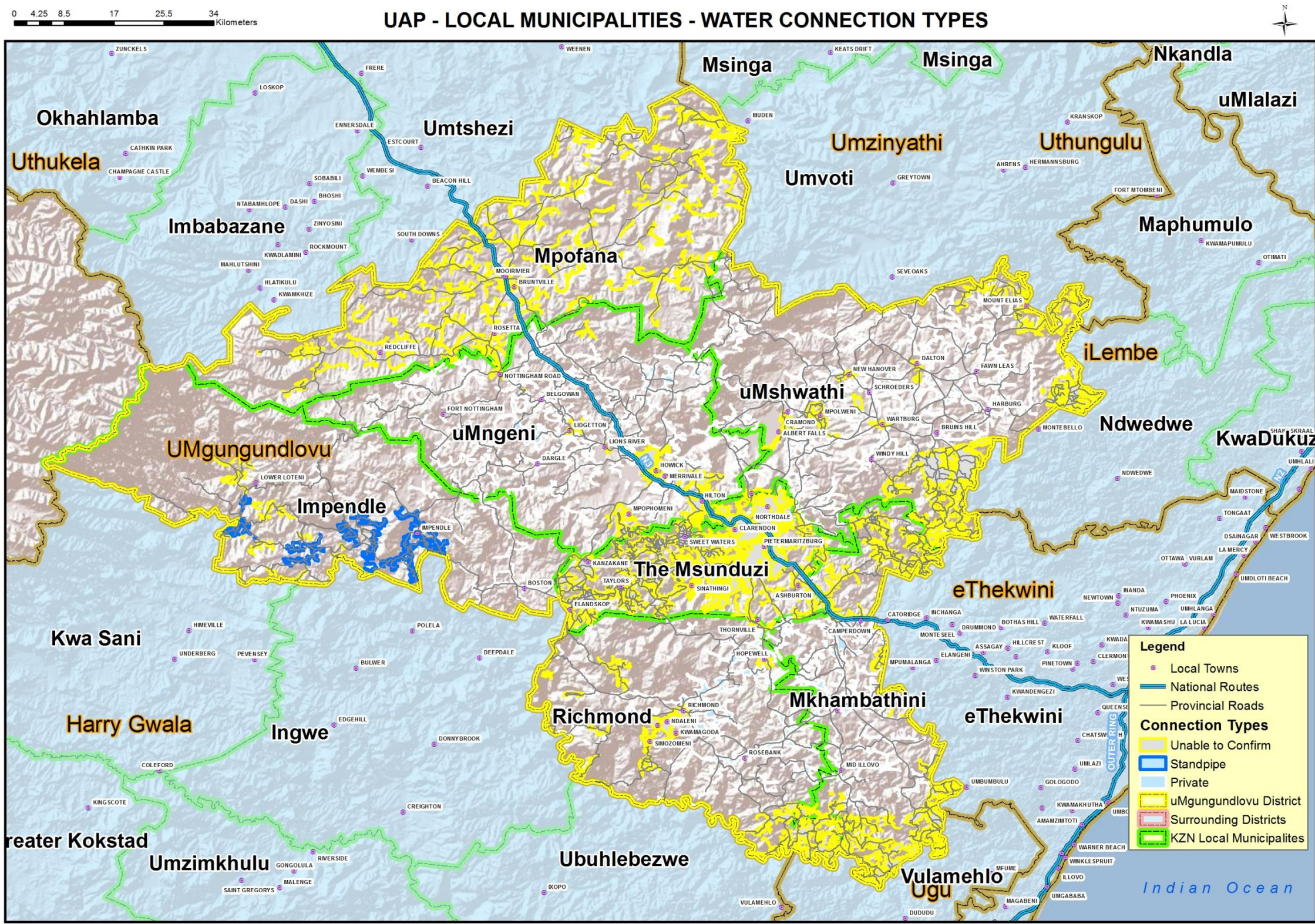
Water Supply & Sanitation Footprints



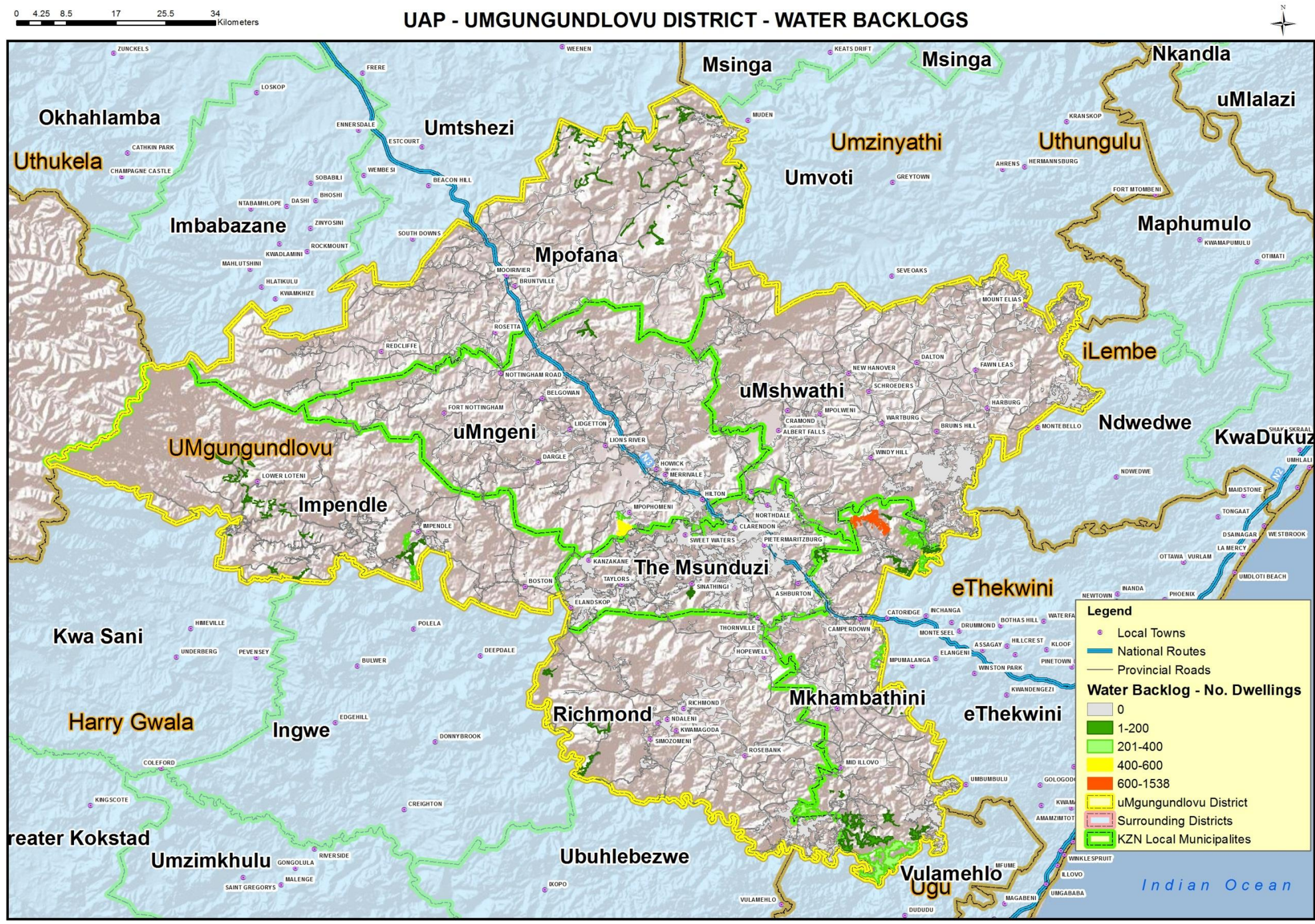
Map 1: uMgungundlovu District Municipality Water Supply



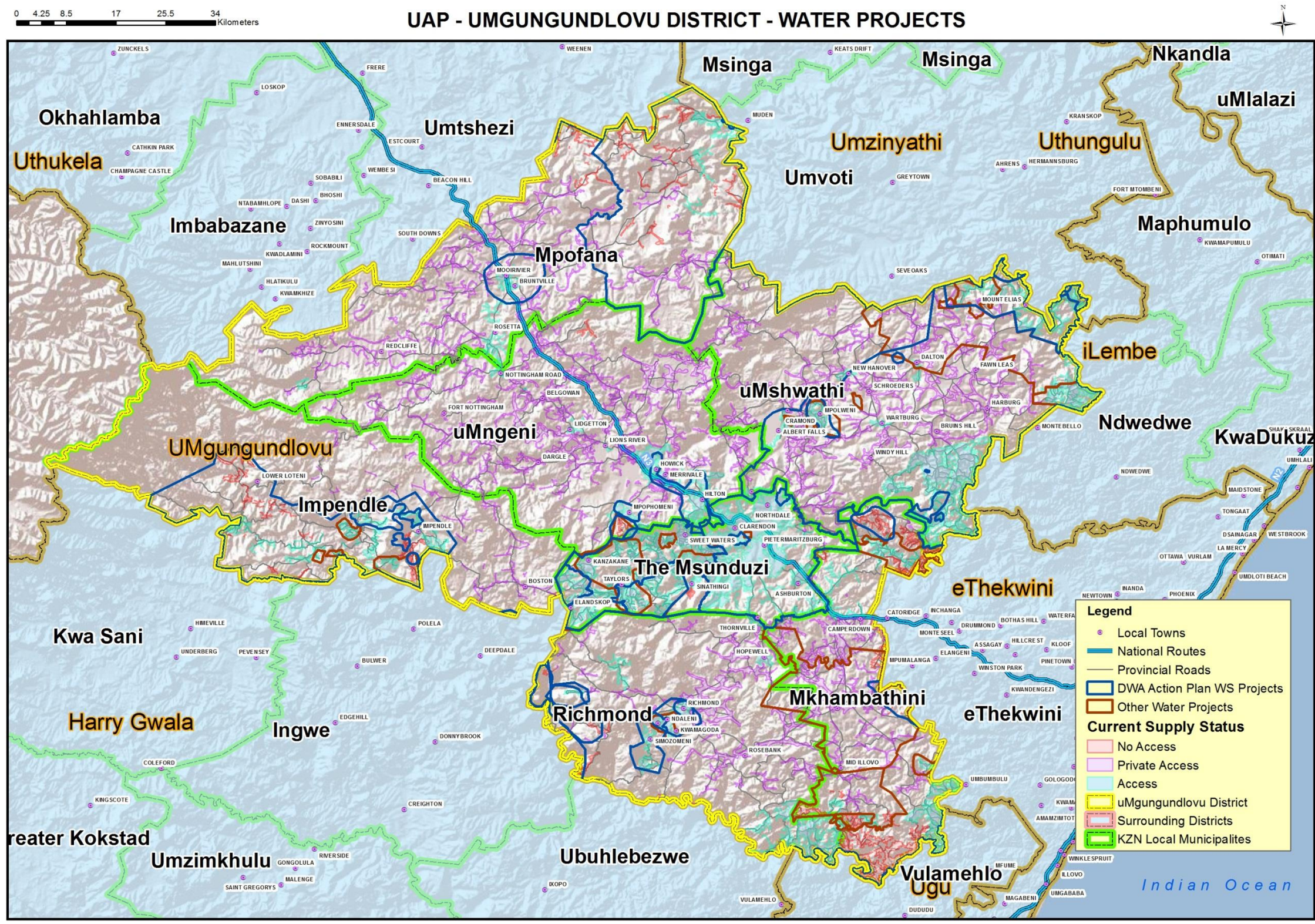
Map 2: uMgungundlovu District Municipality Dwelling Distribution



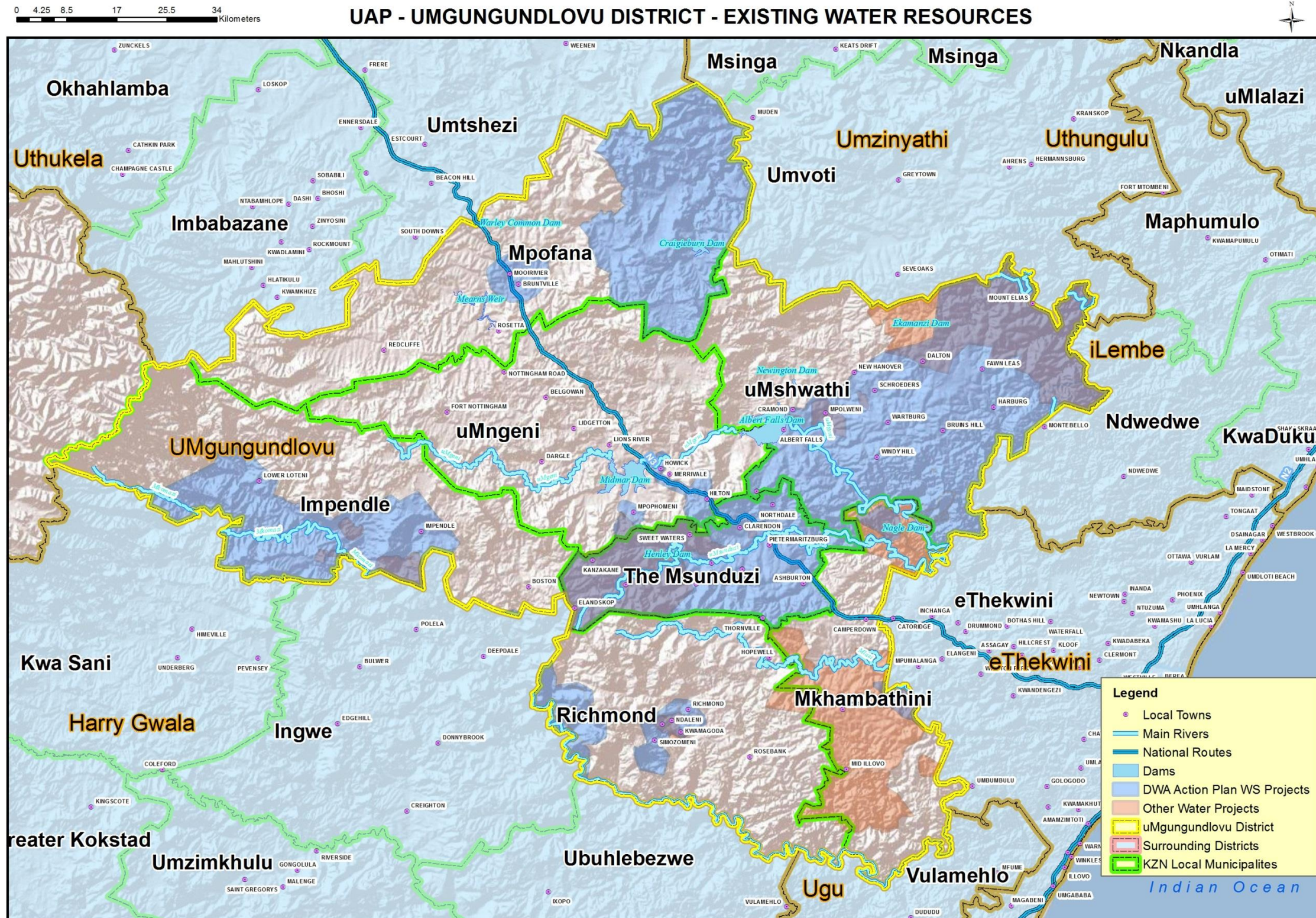
Map 3: uMgungundlovu District Municipality Water Connection Types



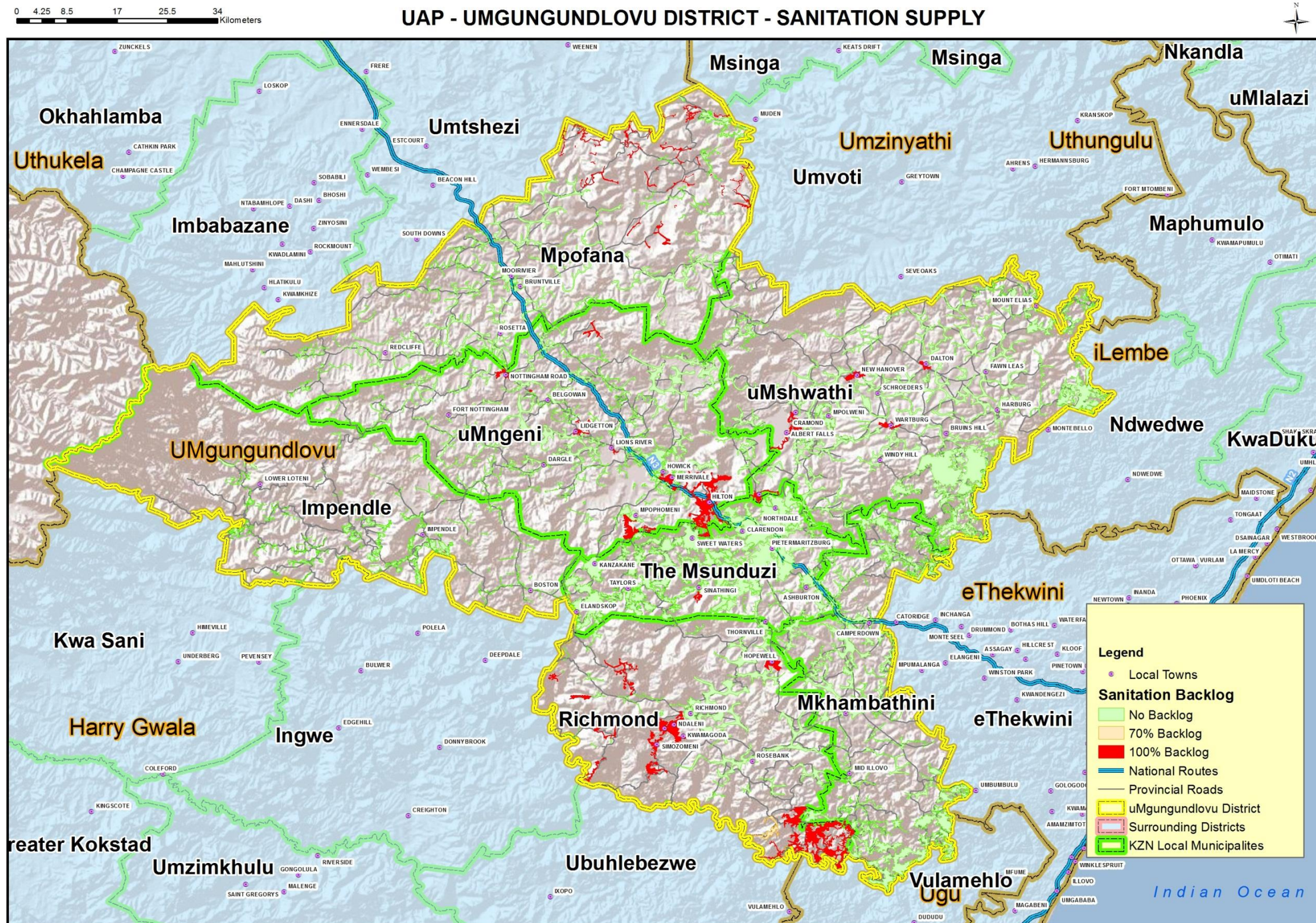
Map 4: uMgungundlovu District Municipality Water Backlogs



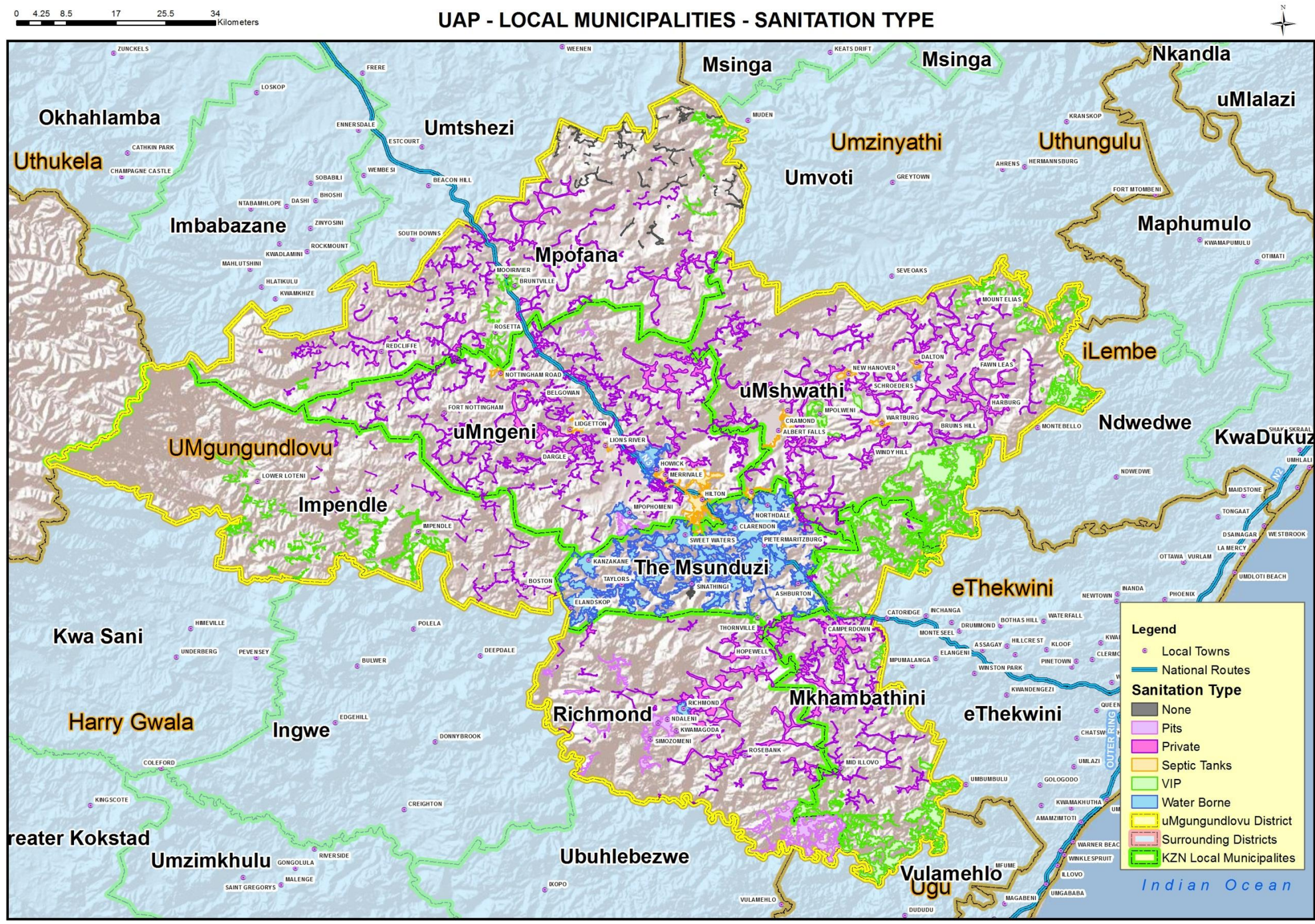
Map 5: DWA Water Projects Boundaries - uMgungundlovu District Municipality



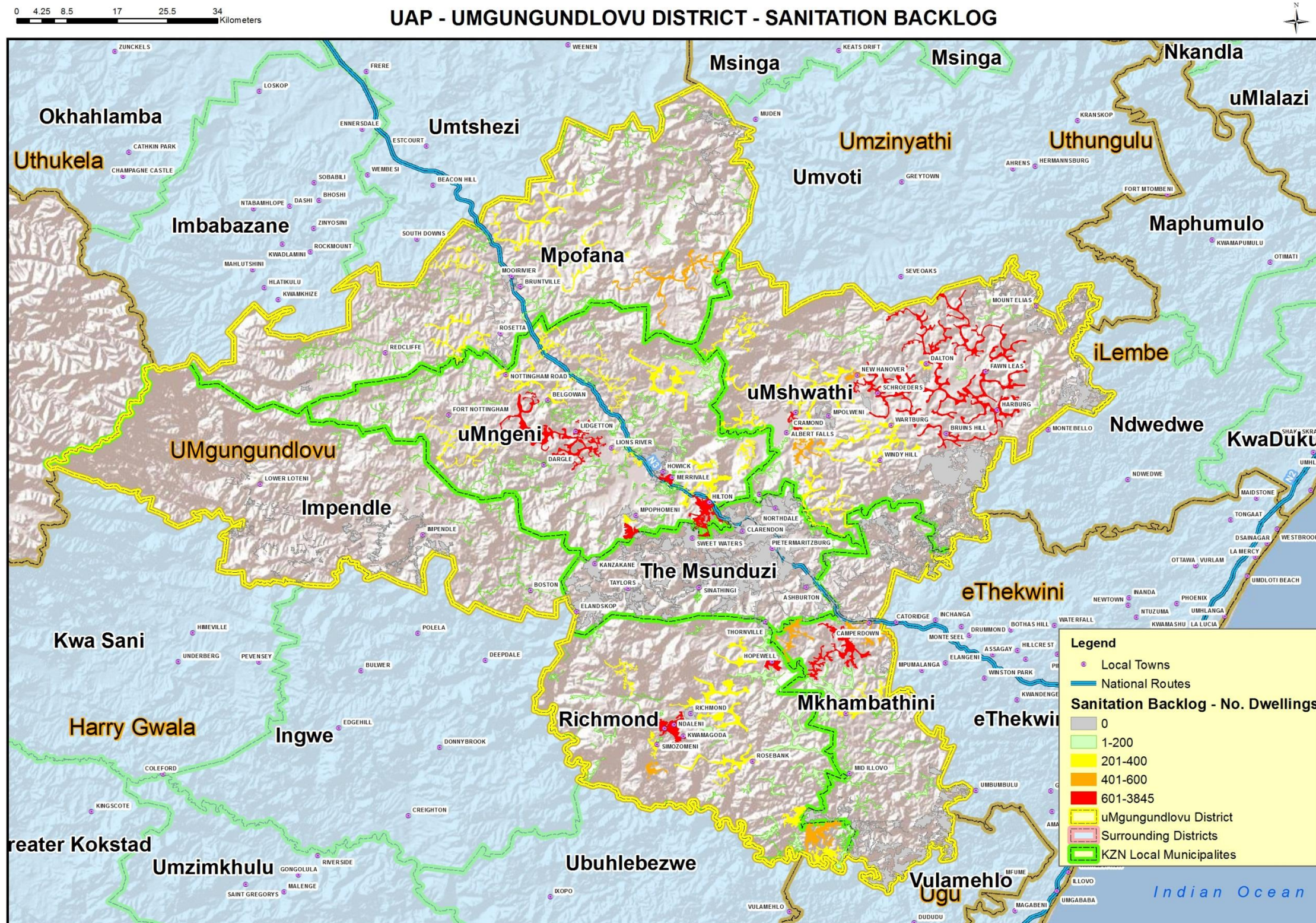
Map 6: uMgungundlovu District Water Resources



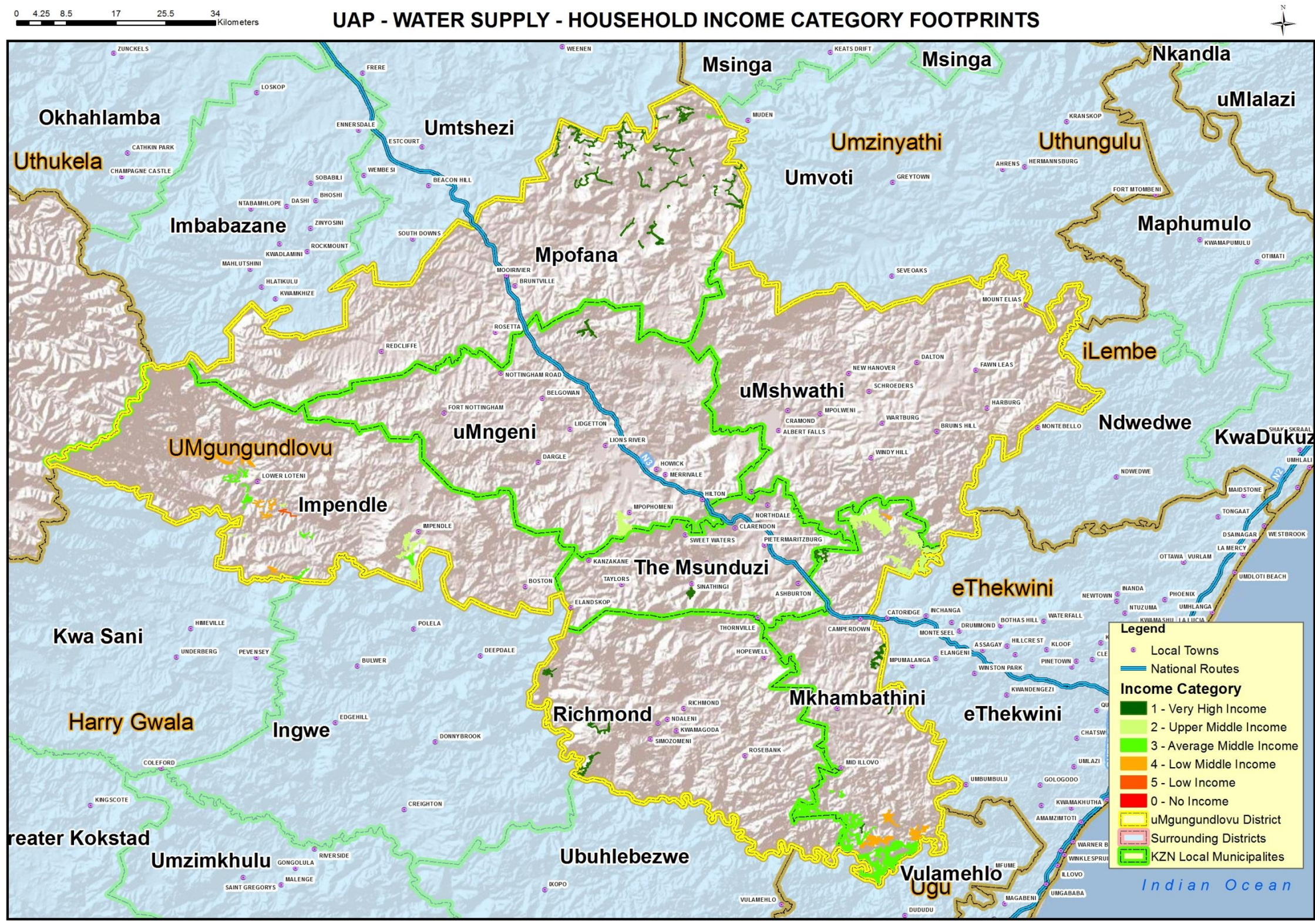
Map 7: uMgungundlovu District Municipality Sanitation Supply



Map 8: uMgungundlovu District Municipality Sanitation Types



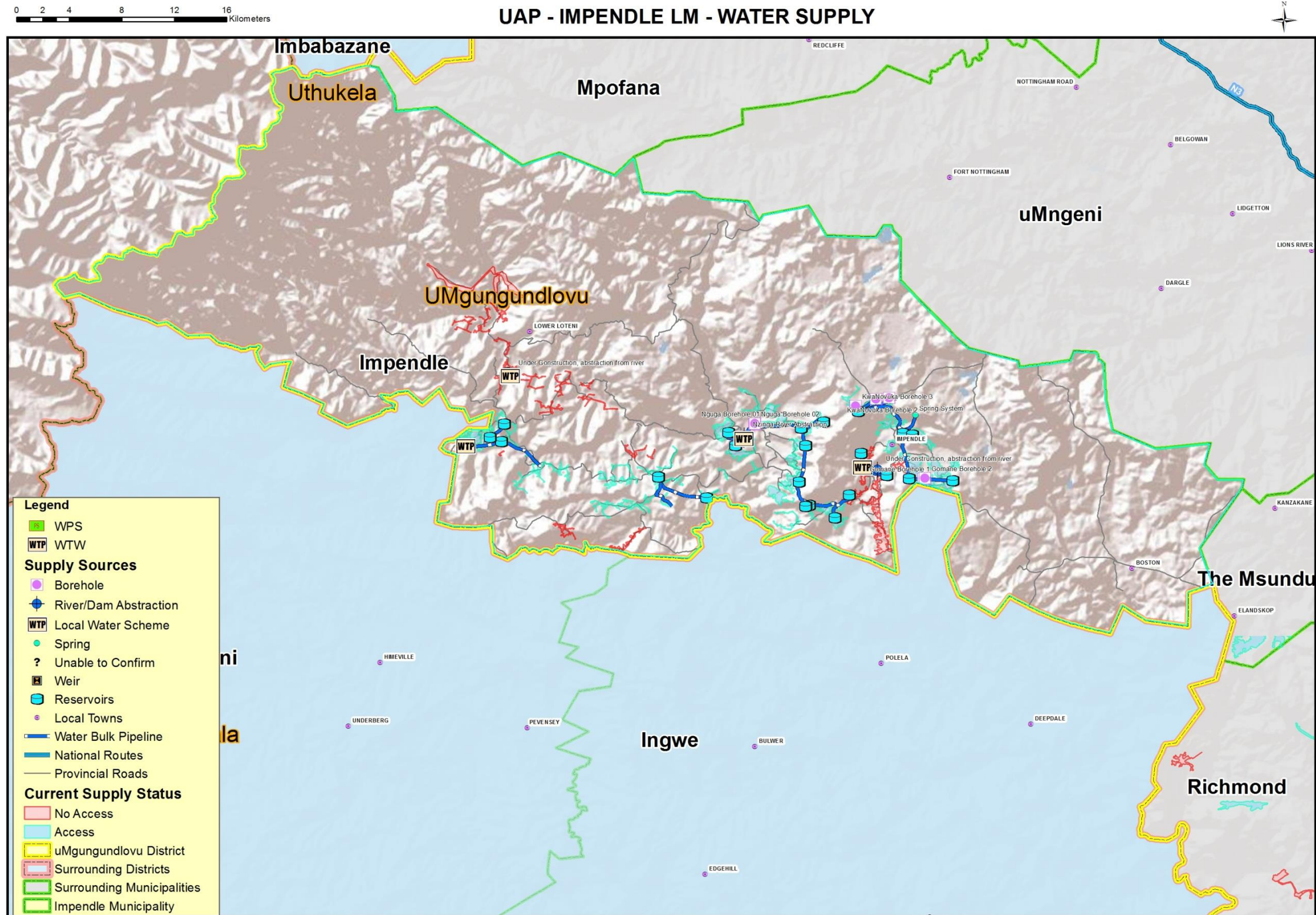
Map 9: uMgungundlovu District Municipality Sanitation Backlogs



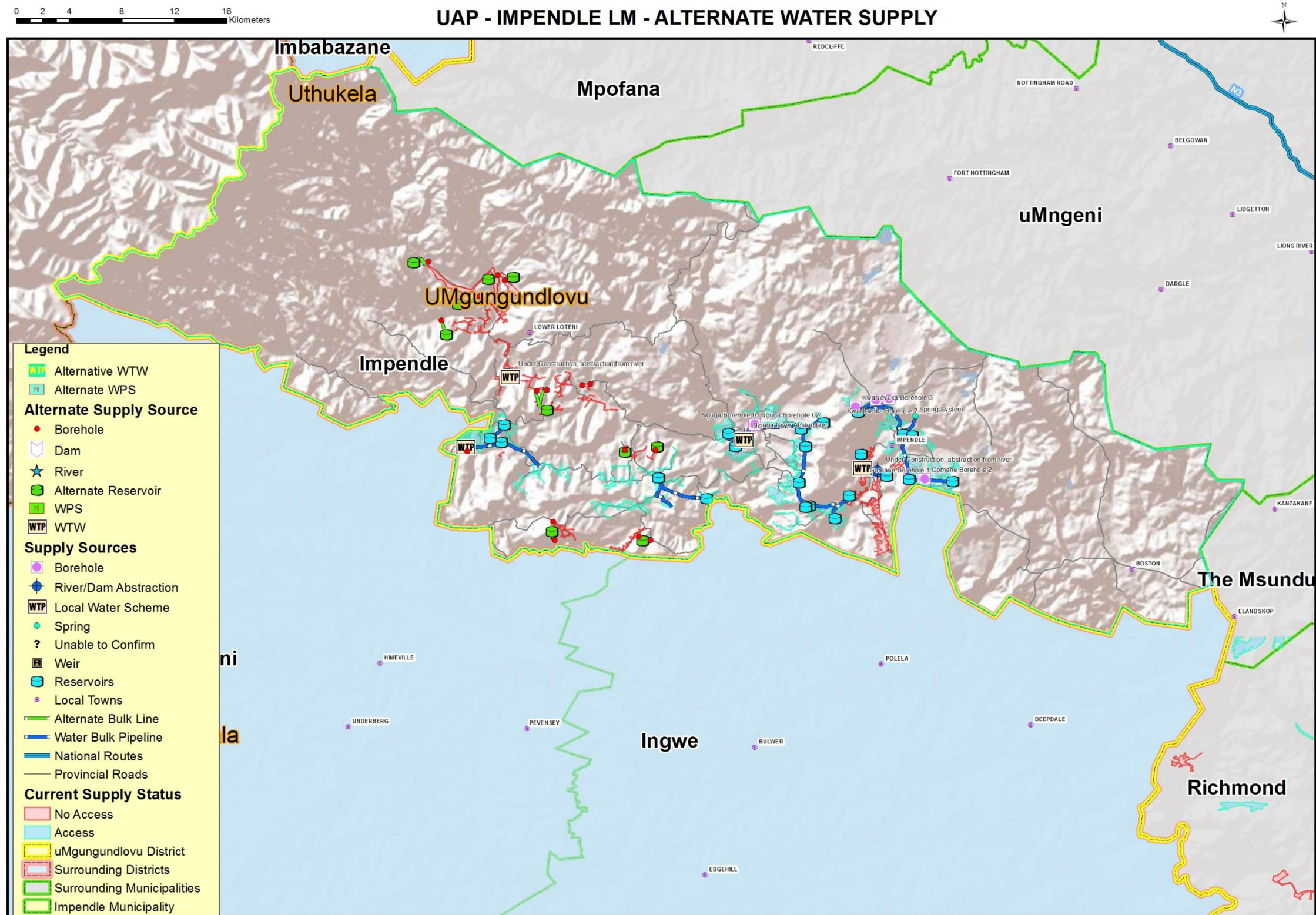
Map 10: uMgungundlovu District Municipality Household Income Categories

Impendle

Water & Sanitation Maps



Map 11: Impendle Water Supply



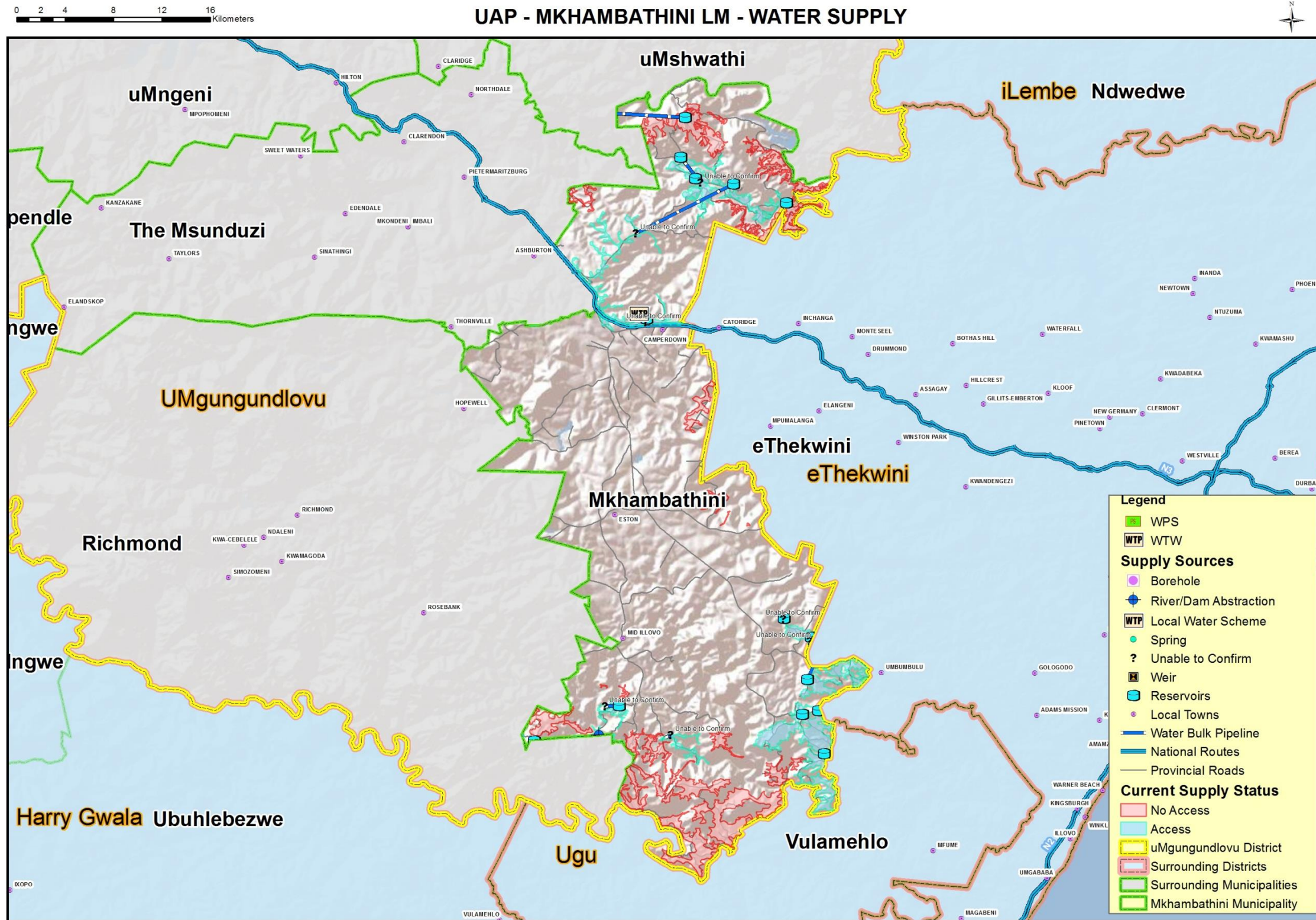
Map 12: Impendle Proposed Alternate Schemes



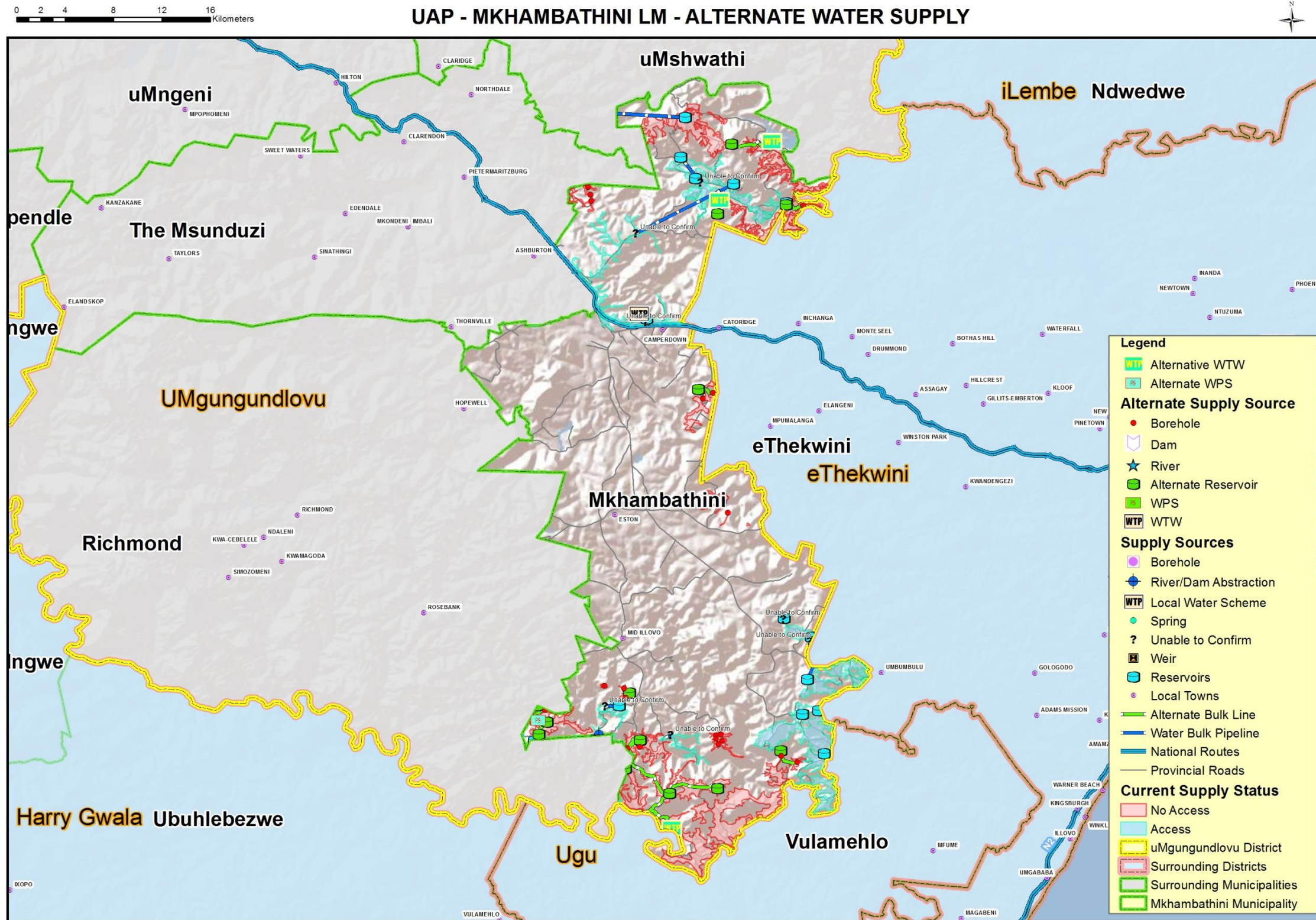
Map 13: Impendle Sanitation Supply

Mkhambathini

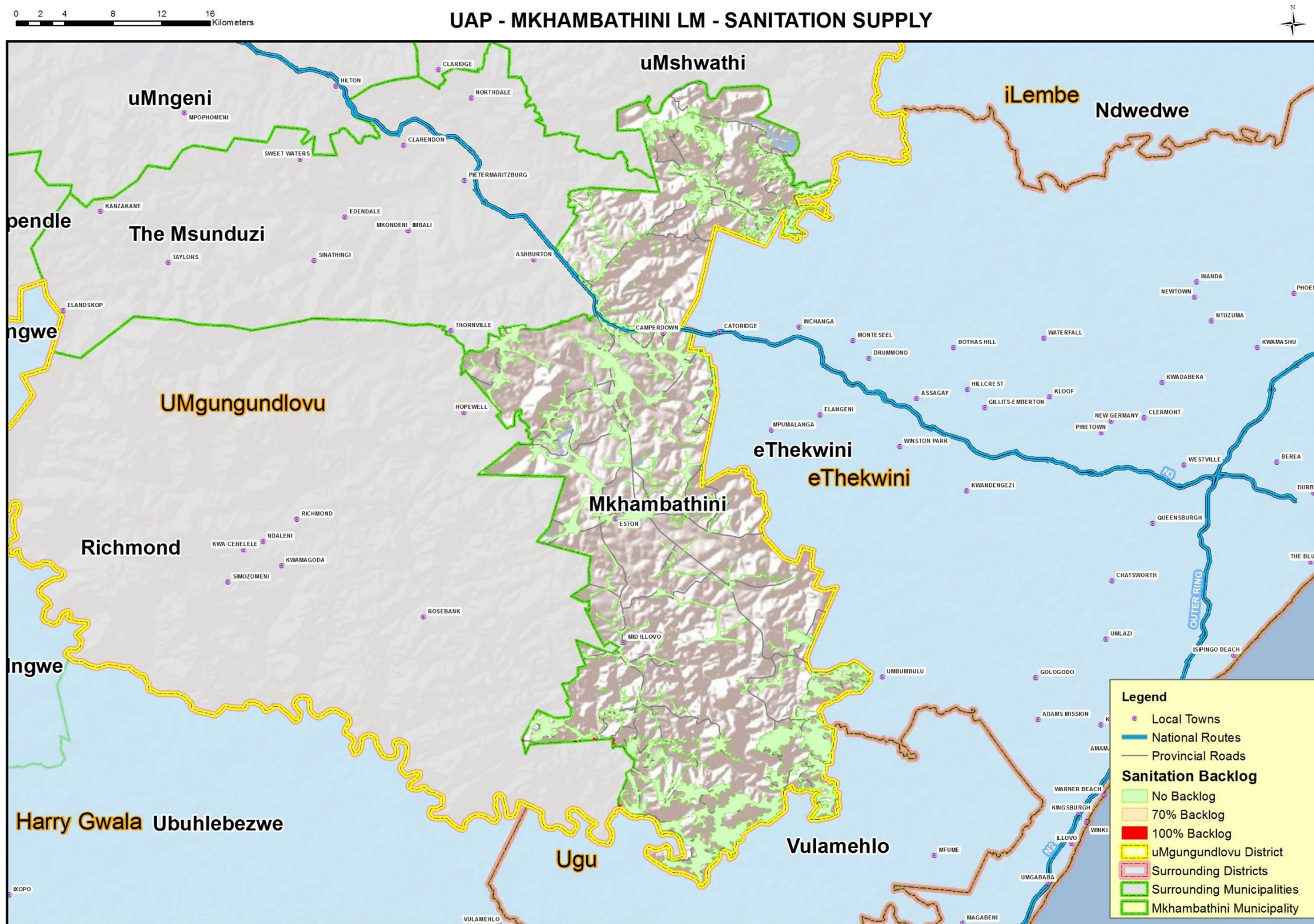
Water & Sanitation Maps



Map 14: Mkhambathini Water Supply



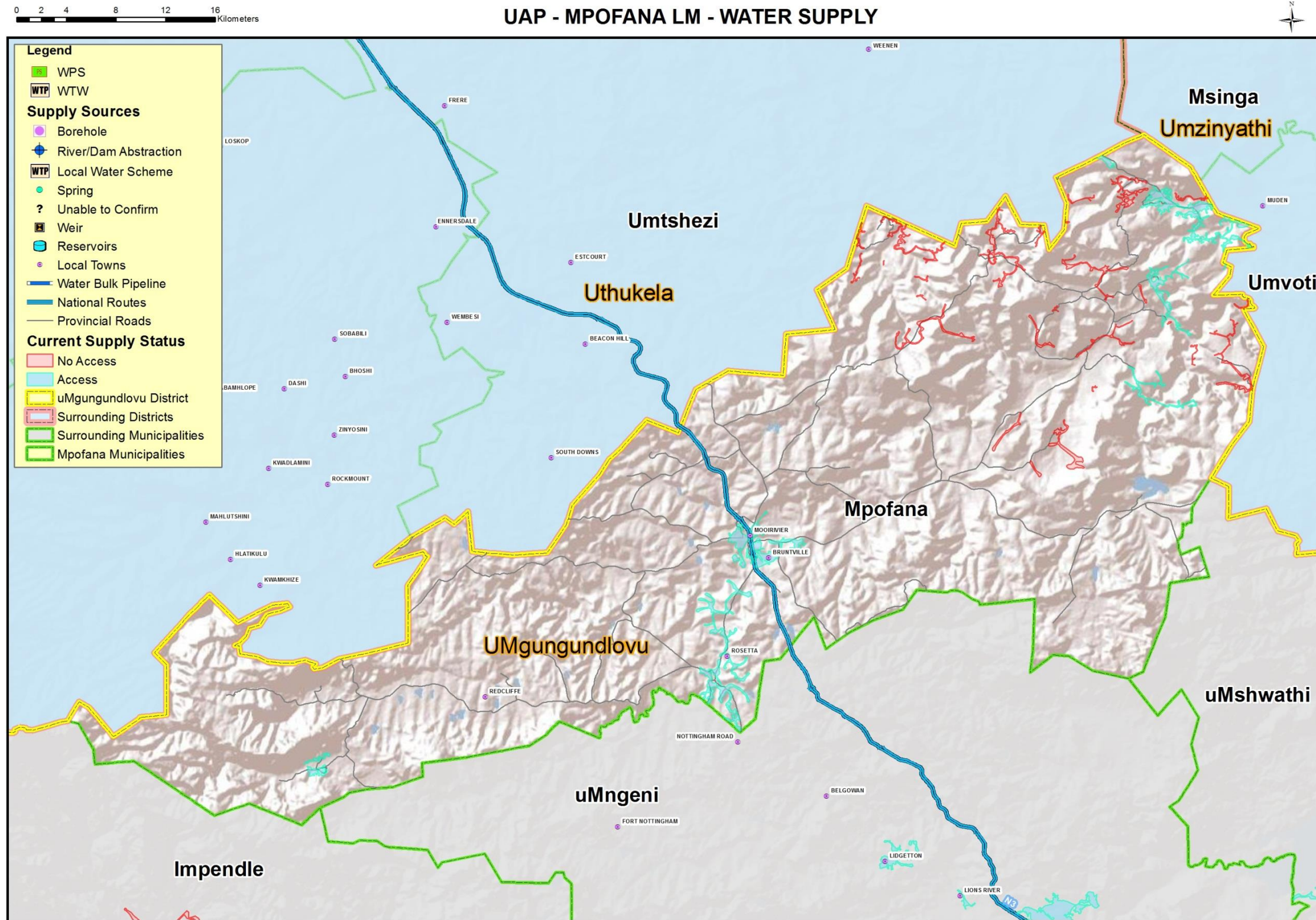
Map 15: Mkhambathini Proposed Alternate Schemes



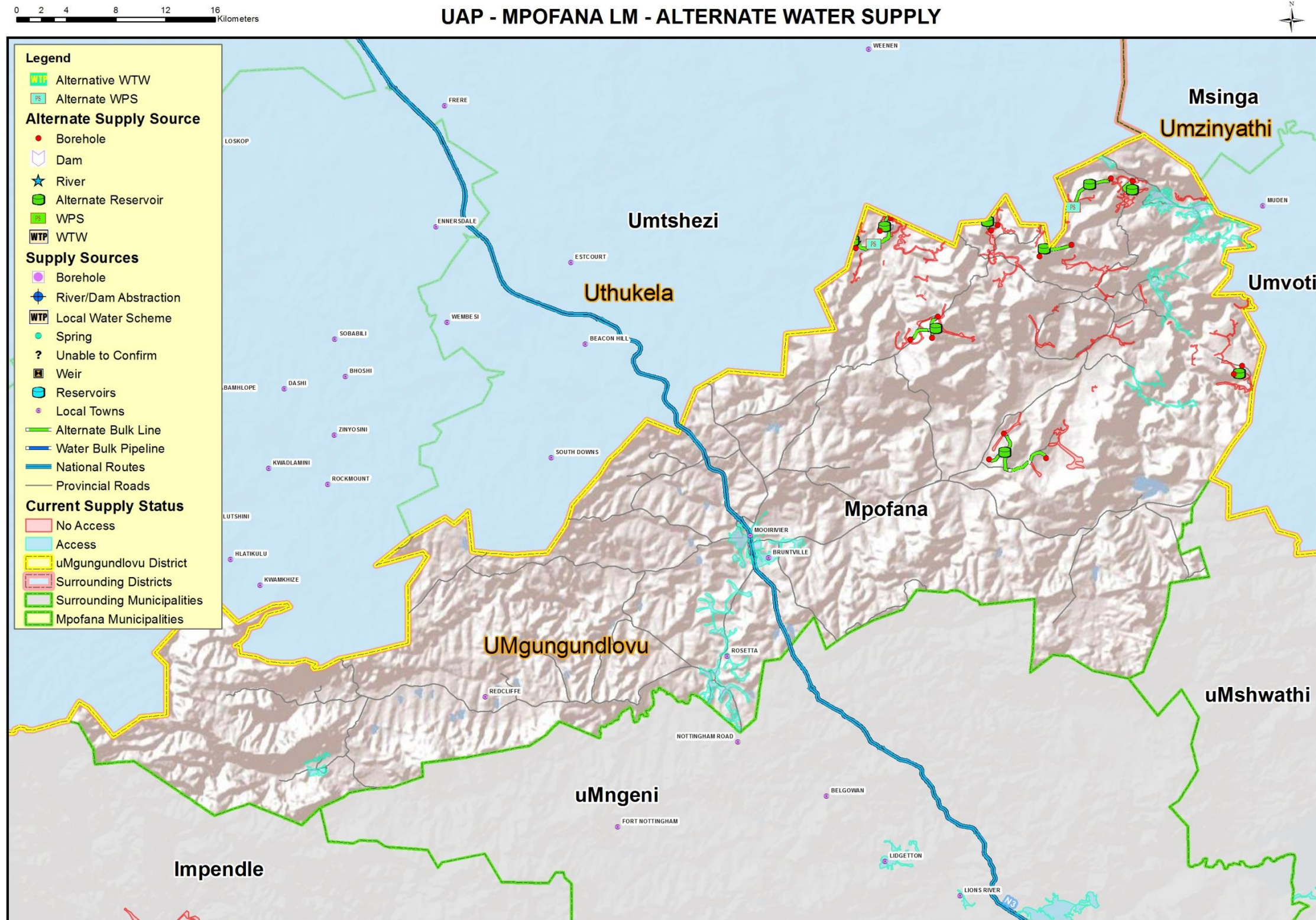
Map 16: Mkhambathini Sanitation Supply

Mpofana

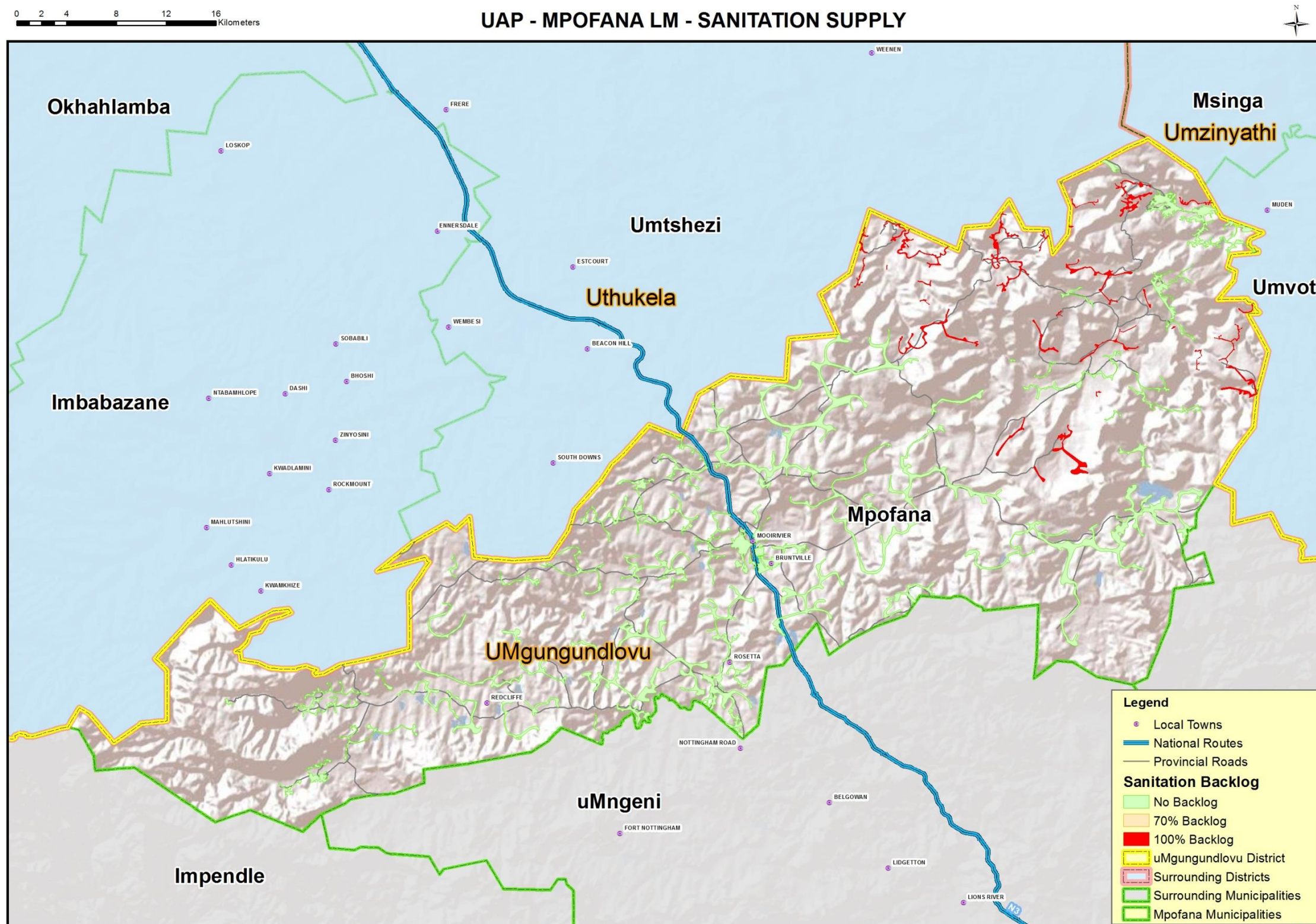
Water & Sanitation Maps



Map 17: Mpopana Water Supply



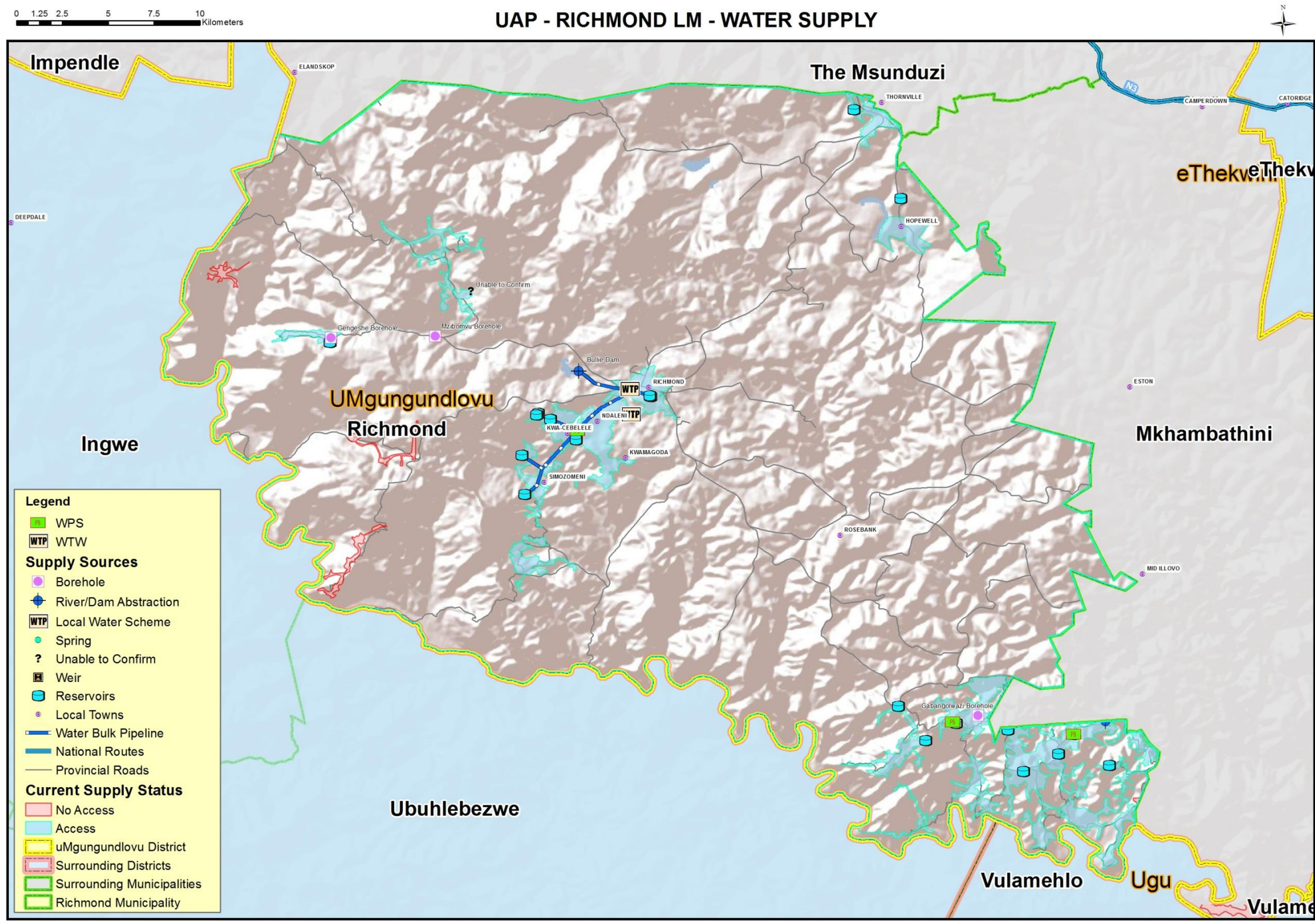
Map 18: Mpopana Proposed Alternate Schemes



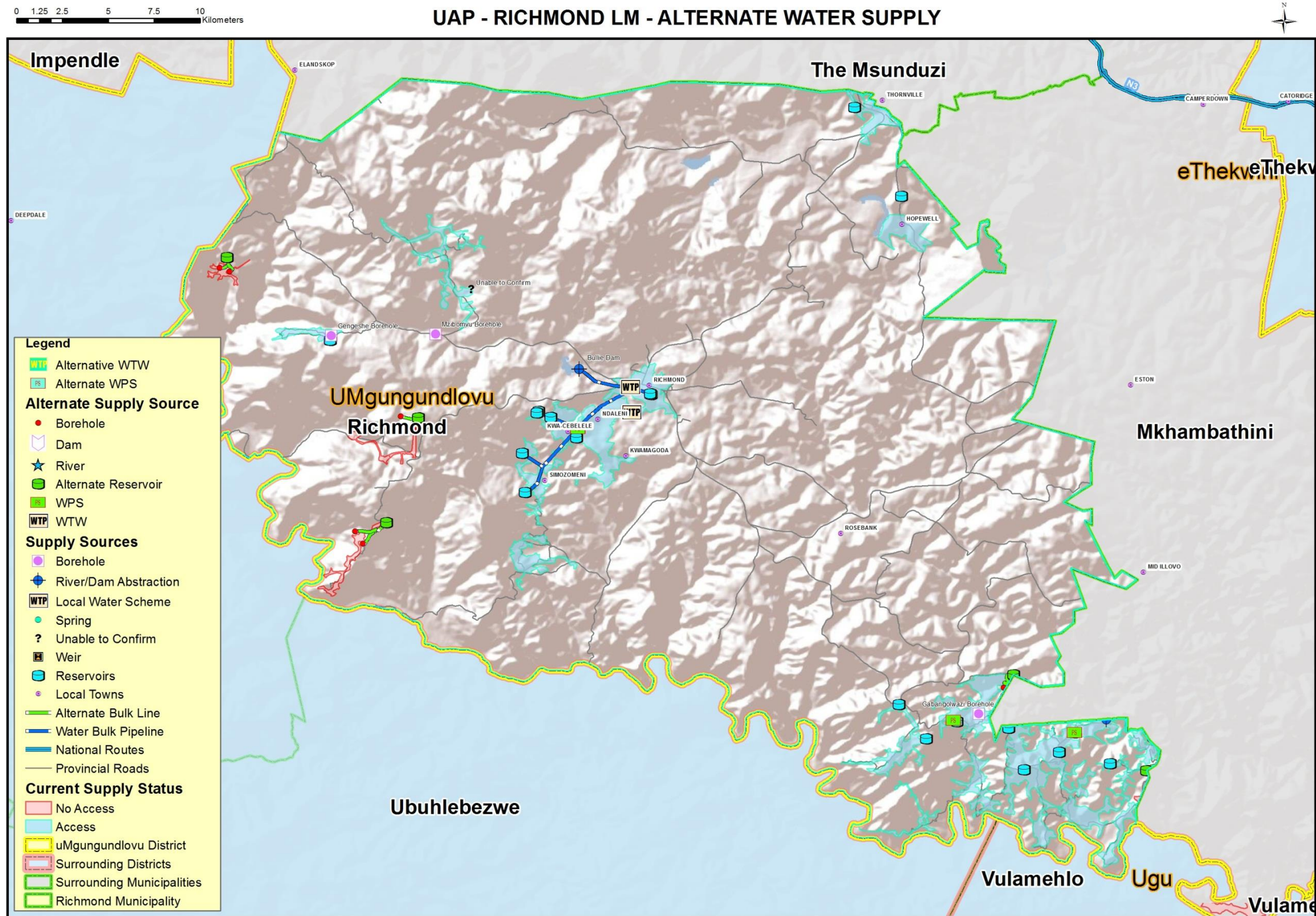
Map 19: Mpopana Sanitation Supply

Richmond

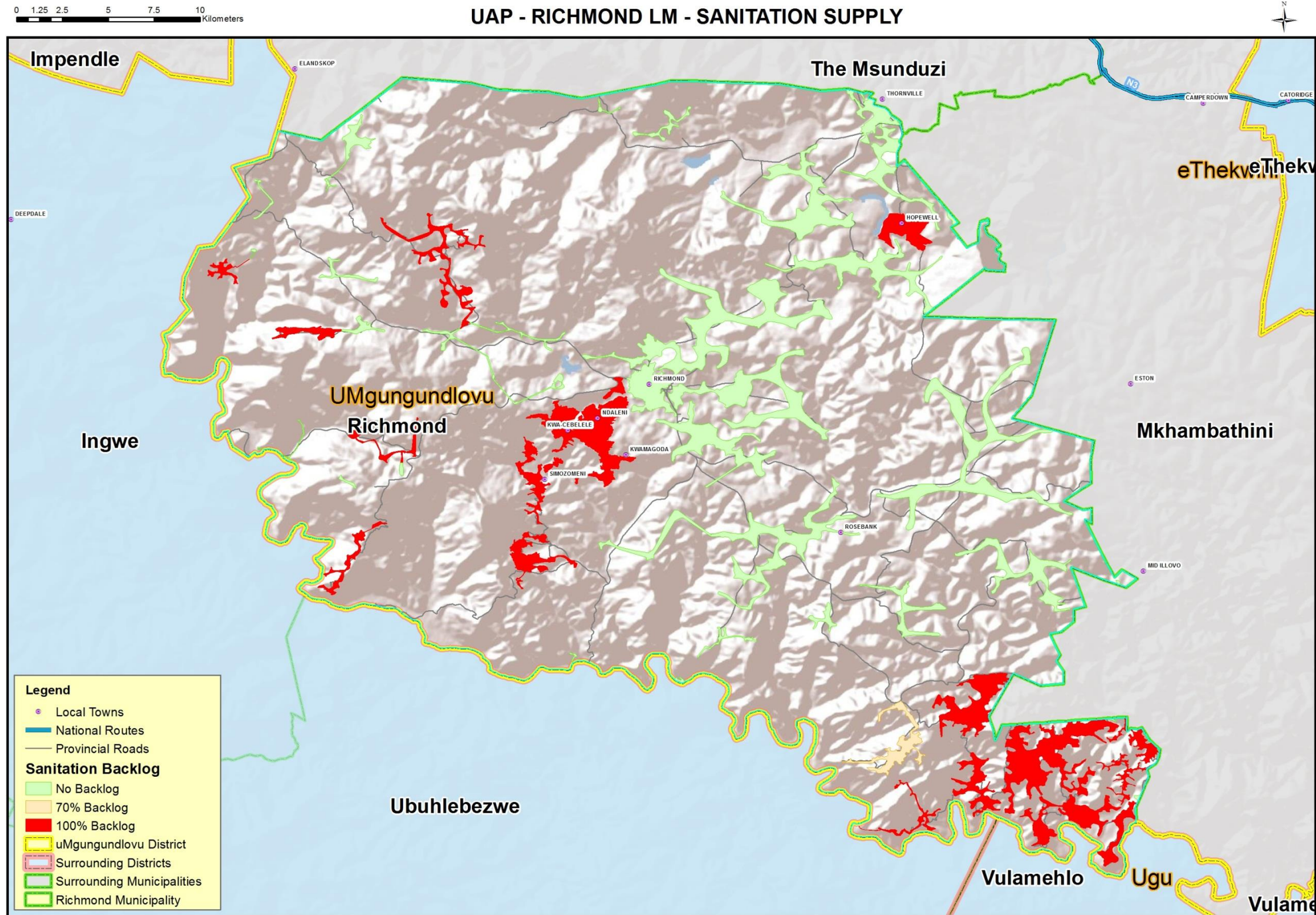
Water & Sanitation Maps



Map 20: Richmond Water Supply



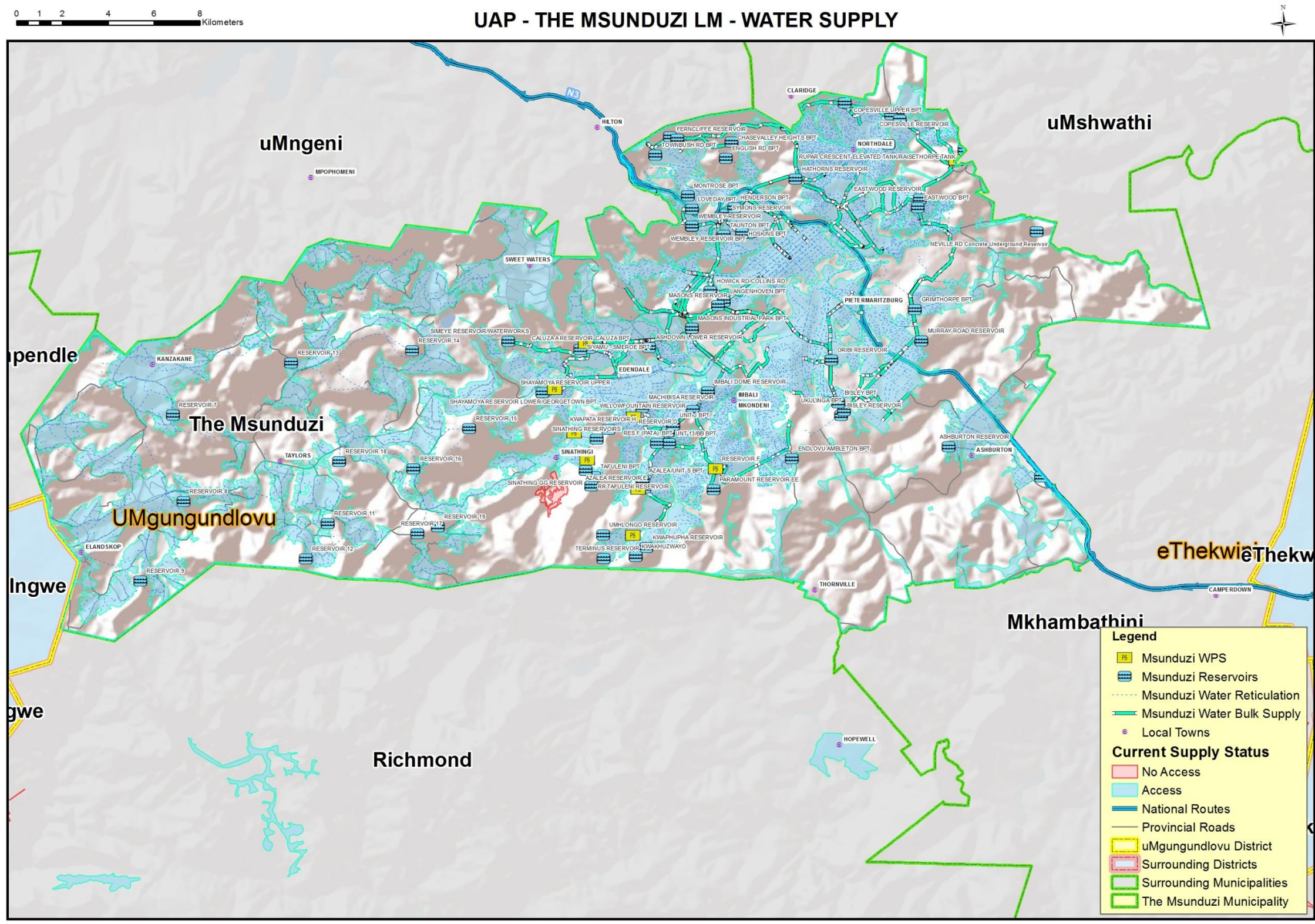
Map 21: Richmond Proposed Alternate Schemes



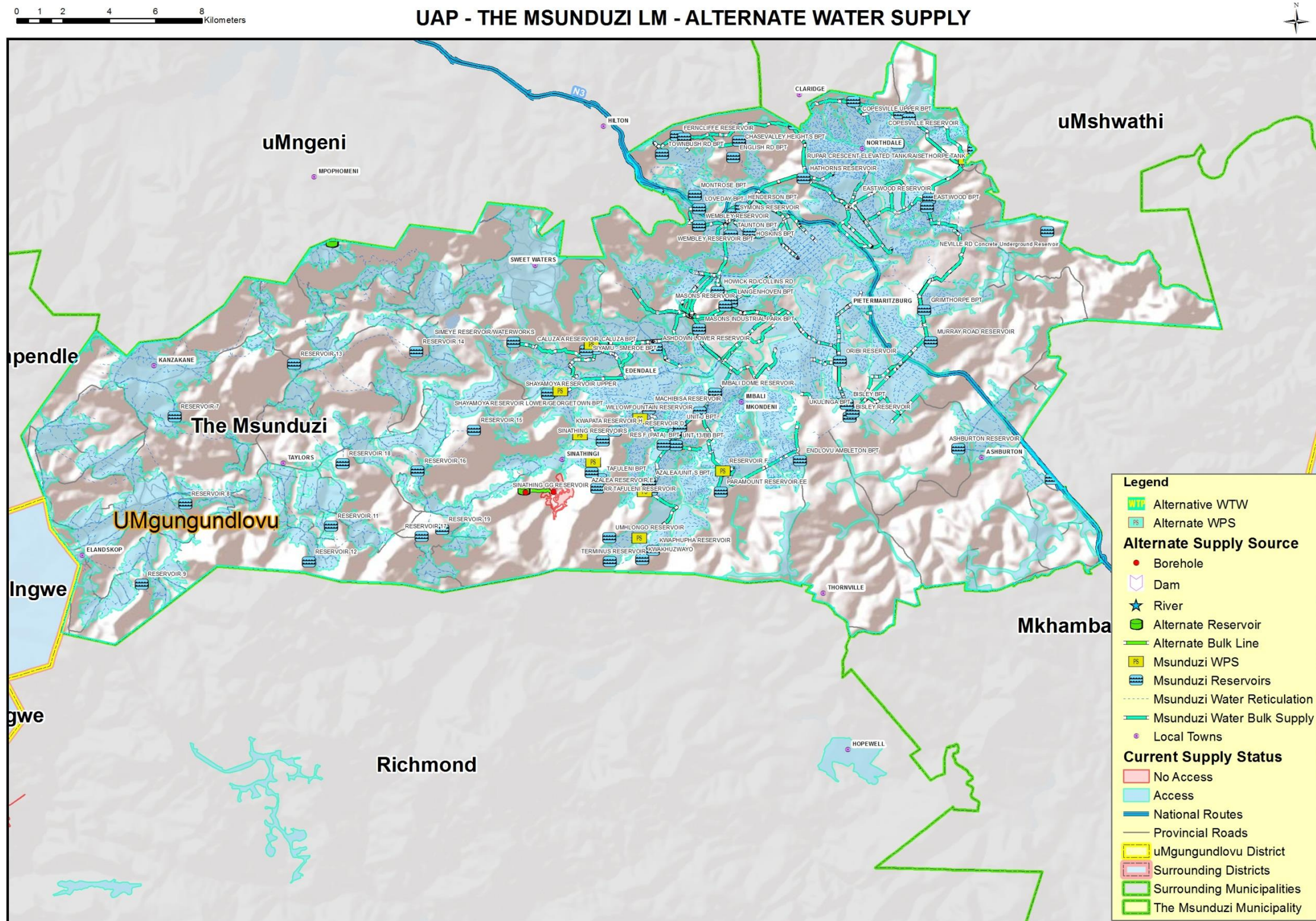
Map 22: Richmond Sanitation Supply

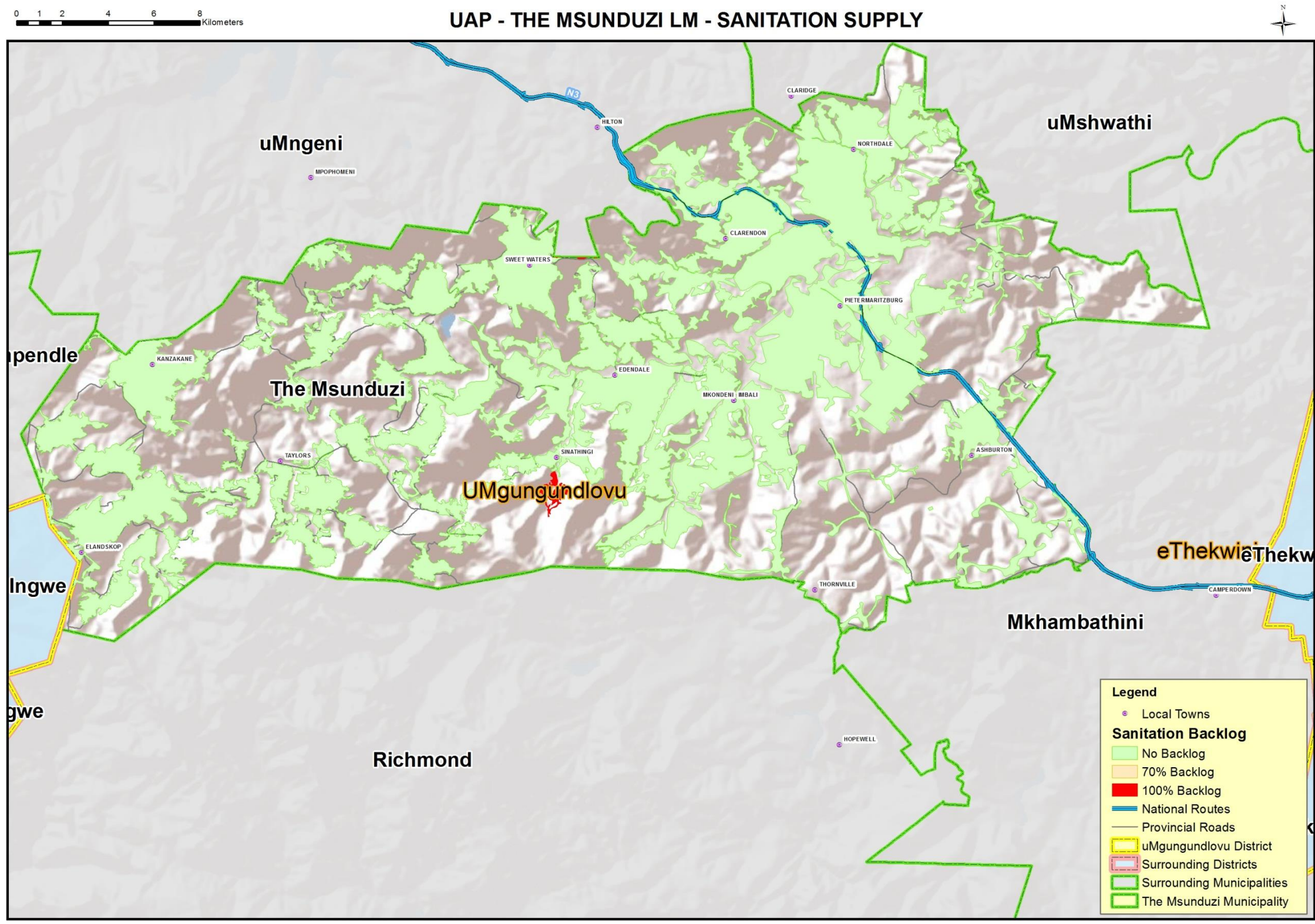
The Msunduzi

Water & Sanitation Maps



Map 23: The Msunduzi Water Supply

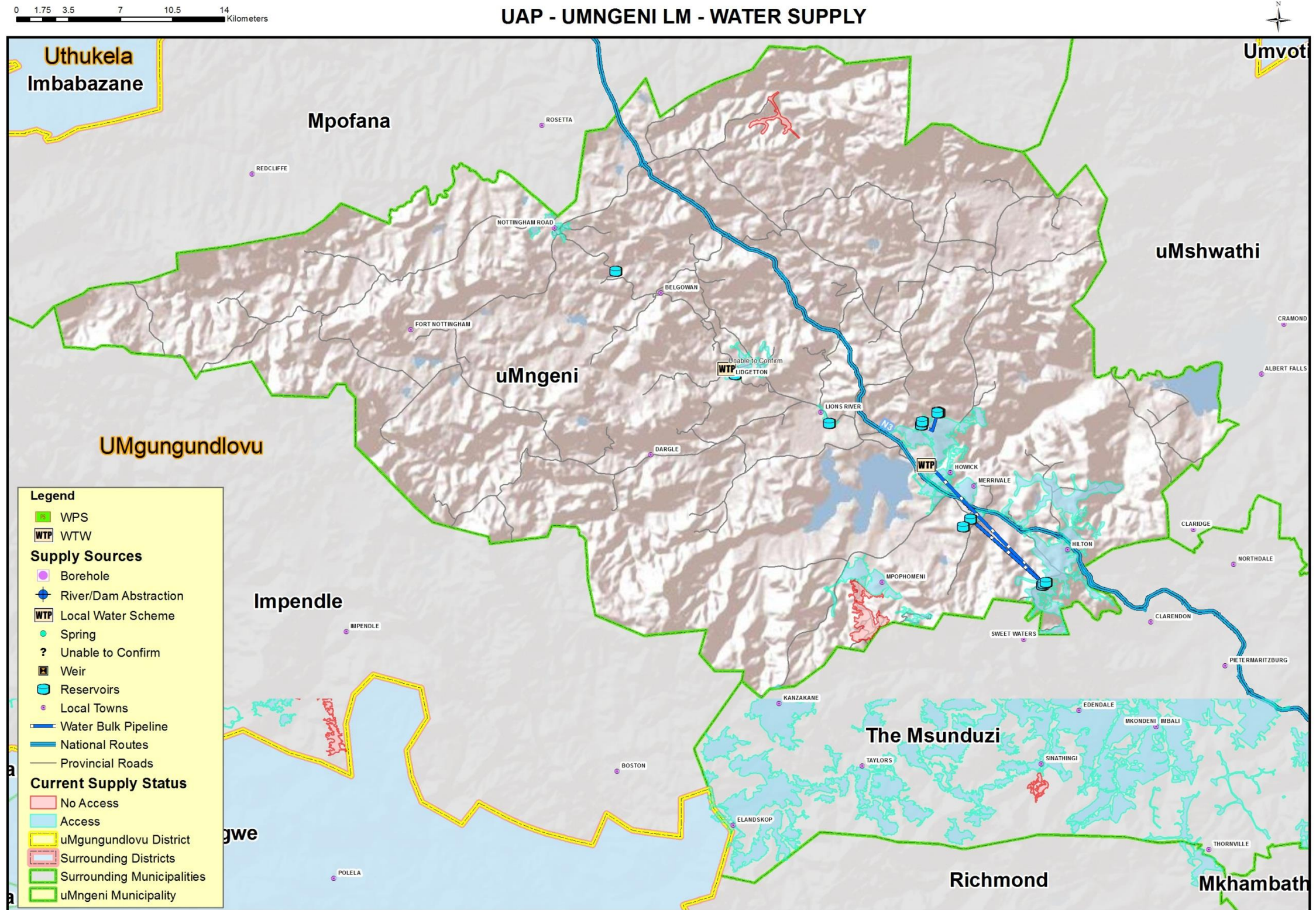




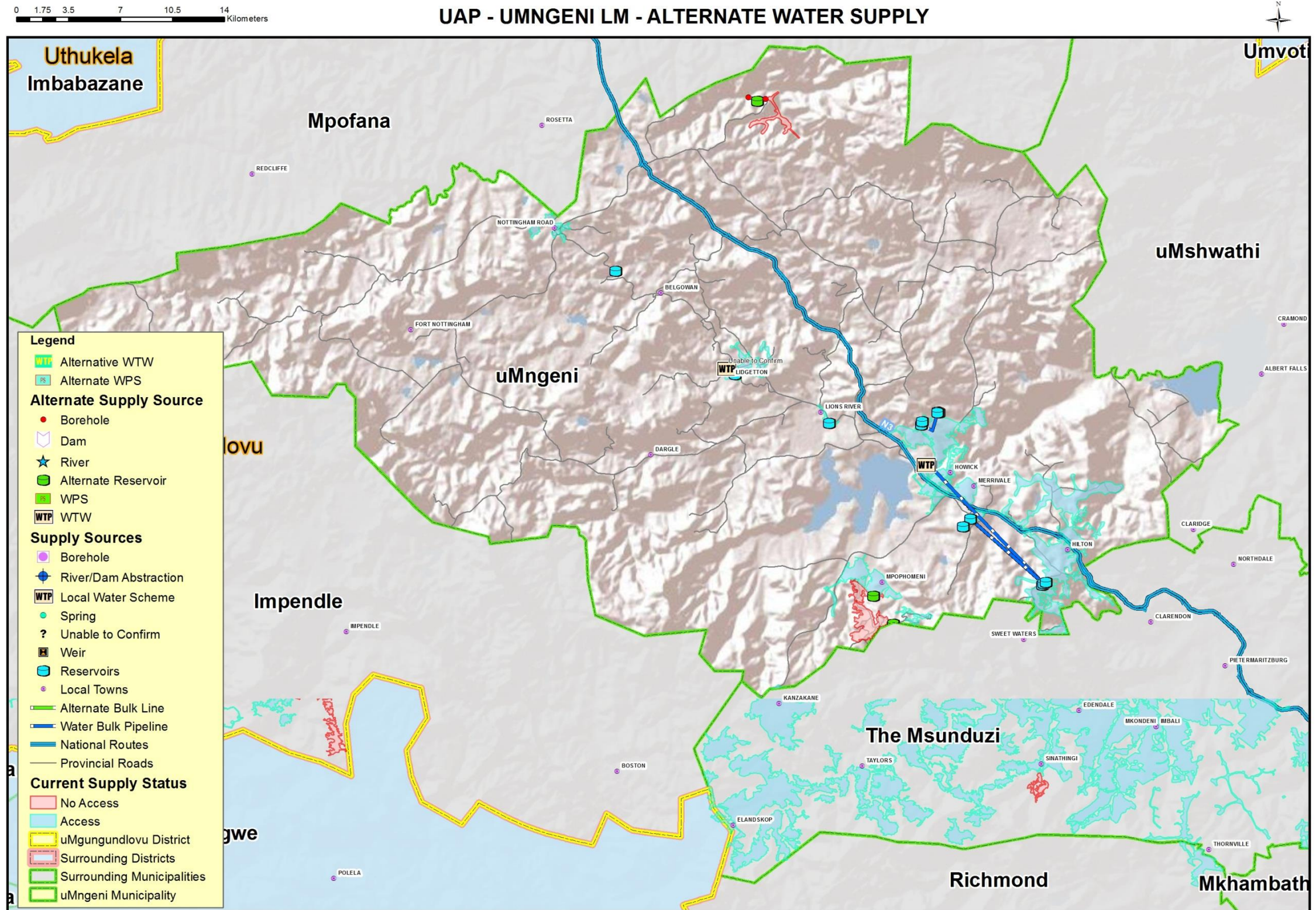
Map 25: The Msunduzi Sanitation Supply

uMngeni

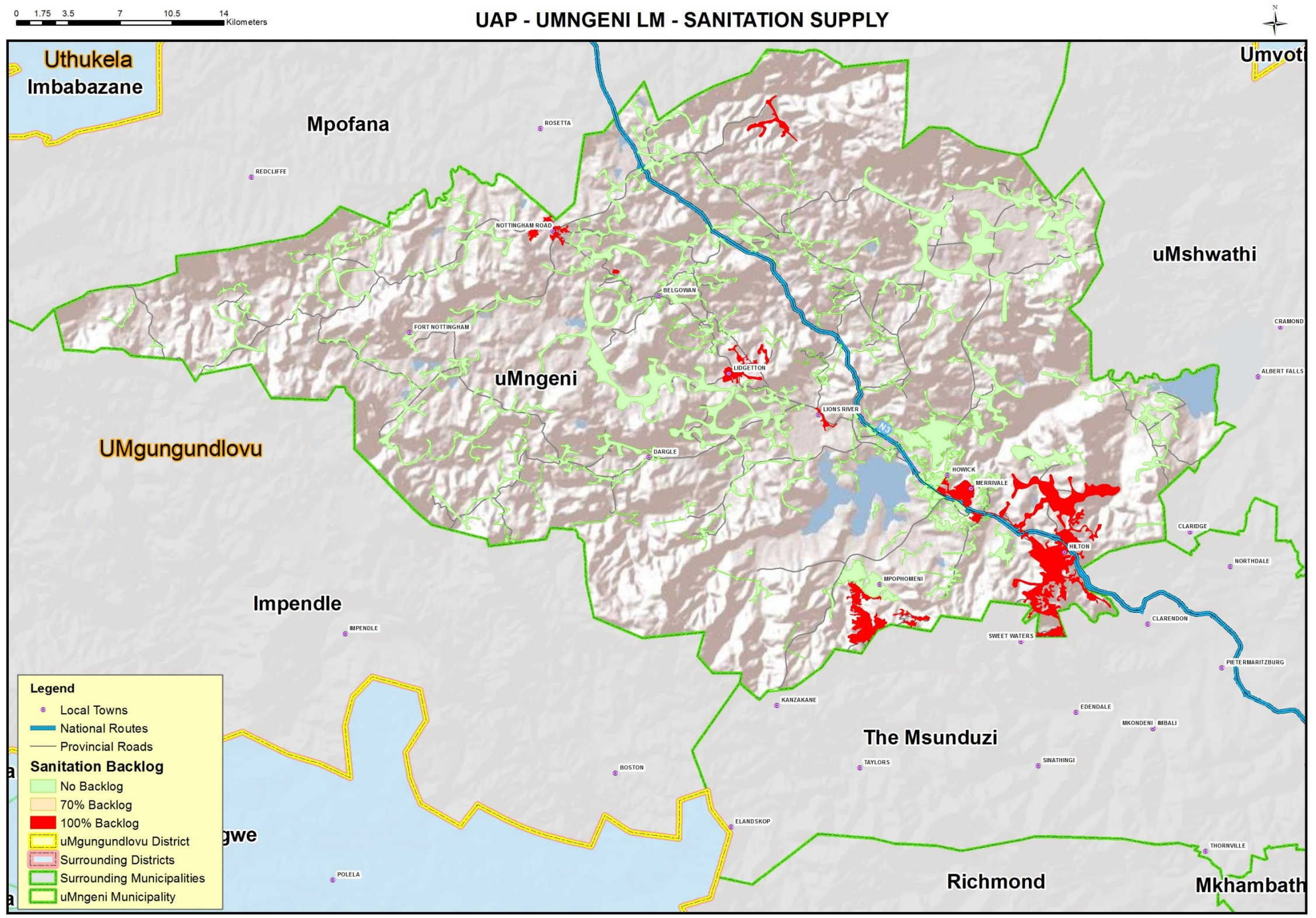
Water & Sanitation Map



Map 26: uMngeni Water Supply



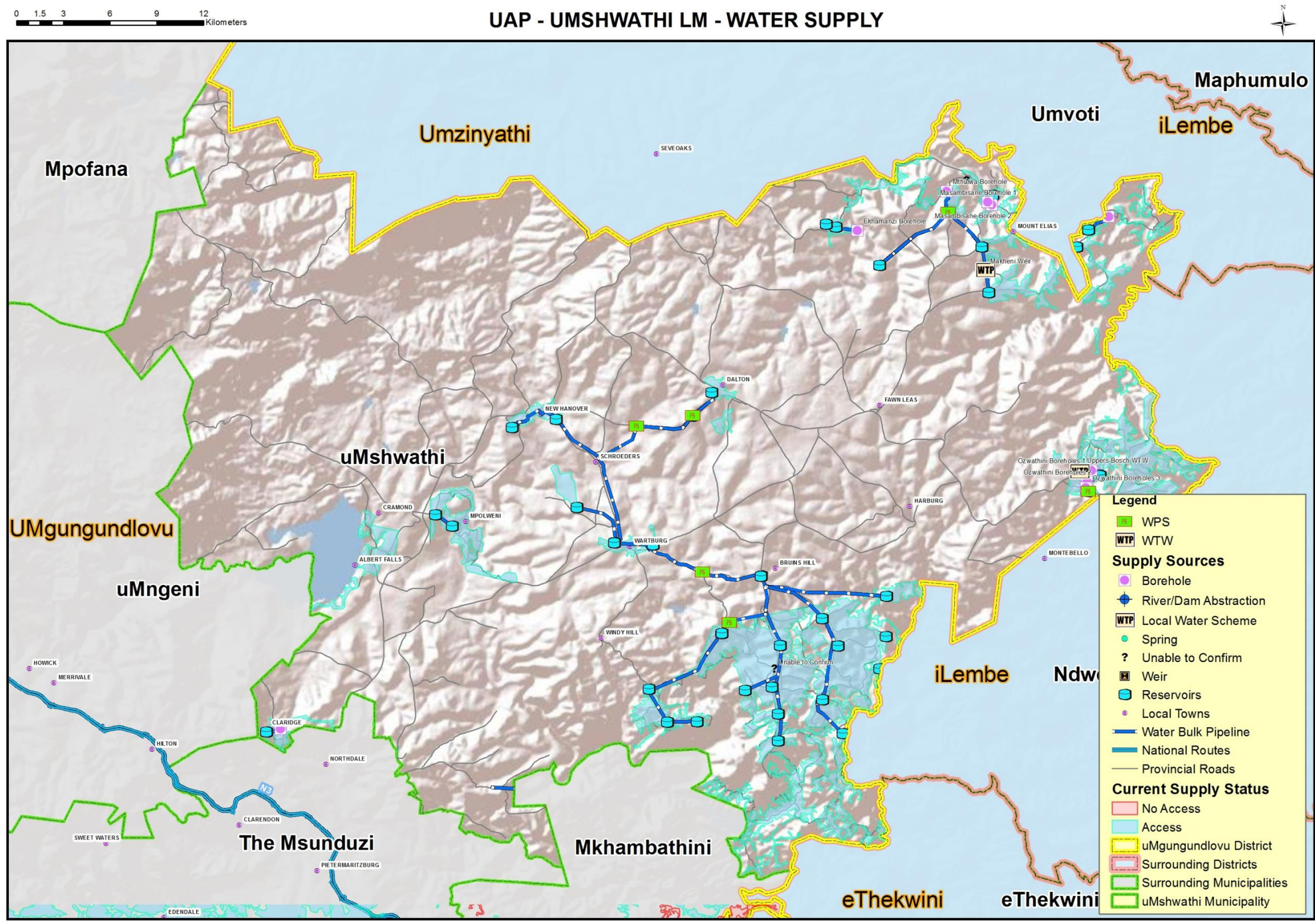
Map 27: uMngeni Proposed Alternate Schemes



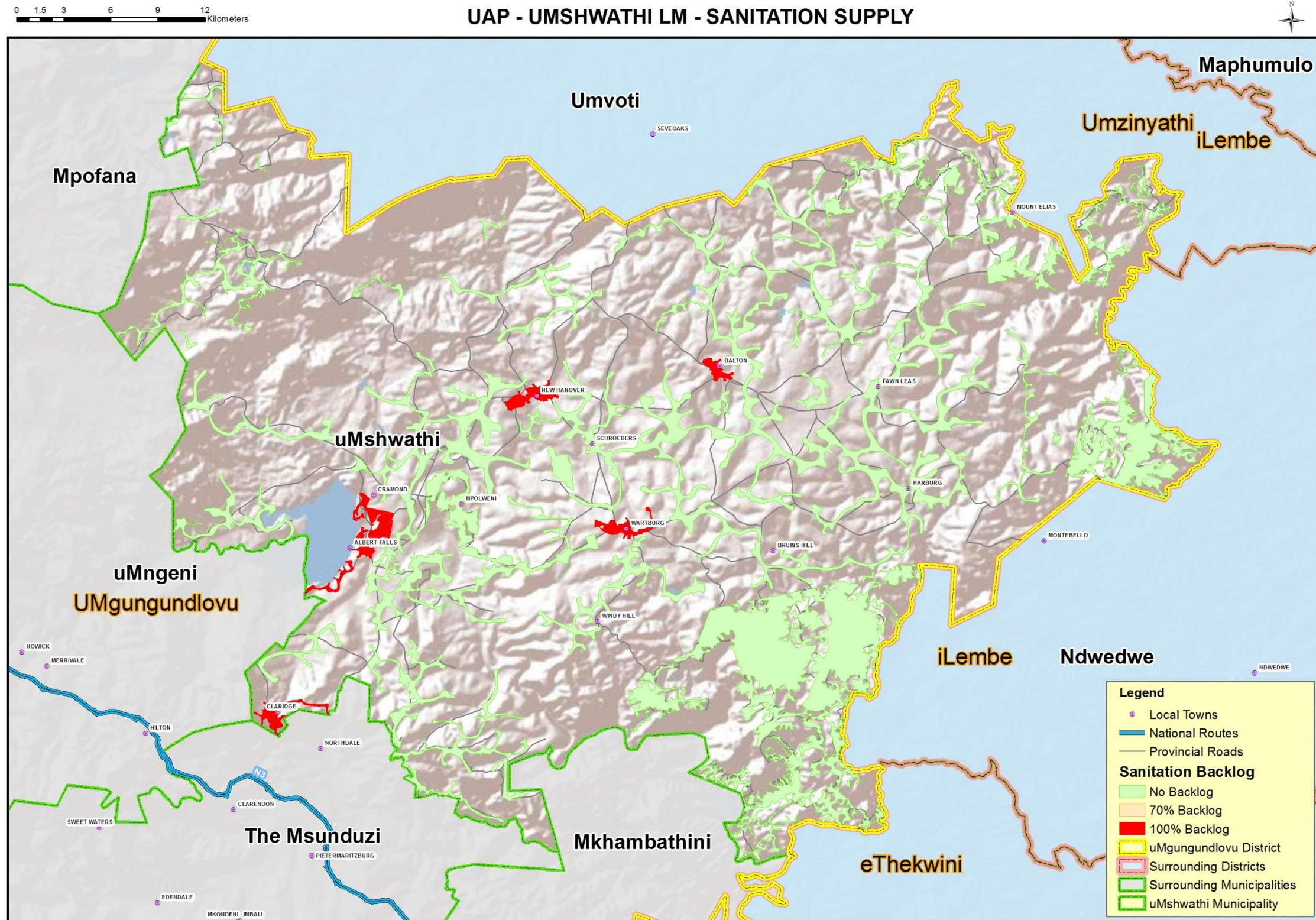
Map 28: uMngeni Sanitation Supply

uMshwathi

Water & Sanitation Map



Map 29: uMswathi Water Supply



Map 30: uMswathi Sanitation Supply

Annexure C

Attributes Data/Tables

Water Supply Footprints

Field Name	SMEC Field	Alias	Description	Units	Source
District Municipality		District Municipality	Name of the municipality in which the area falls	Text Description	GIS (Pre Populated)
Area_m2		Area in square metres	GIS calculated	Number	GIS (Pre Populated)
Name		Name	Name of area if known	Text Description	GIS (Pre Populated)
Short_SS	Wat_Supp	Short term supply status	Defines existing supply status	Y/N	Delphi
	Sust_2016		Is existing supply sustainable to 2016?	Y/N	Delphi
	Sust_2016Need		If N, What needs to be done to ensure sustainable supply to 2016?	Text Description	Delphi
	Plan_Aft2016		Are there existing plans to ensure sustainably beyond 2016?	Y/N	Infrastructure Manager/ MIG/ WIG/IDP
	30Yr_Pln		If Y, are these plans for 30 year horizon?	Y/N	Infrastructure Manager/ MIG/ WIG/IDP
	30Yr_PlnDesc		If Y, what are these plans.	Text Description	Infrastructure Manager/ MIG/ WIG/IDP
			If N, What needs to be done to ensure sustainable supply to 2046?	Text Description	Infrastructure Manager/ MIG/ WIG/IDP
Schm_E		Existing scheme name	Name of any existing supply scheme	Text Description	Delphi
Schm_F		Future scheme name	Name of any future proposed scheme	Text Description	Delphi
Sou_E		Existing source	Existing water source from lookup table	Lookup Value	Delphi
Sou_F		Future source	Future water source from lookup table	Lookup Value	Delphi
WatNam_E		Existing source name	Name of existing source	Text Description	Delphi
WatNam_F		Future source name	Name of future source	Text Description	Delphi
Proj_Typ		Project type	Type of project from lookup table	Text Description	Delphi
SuppDate		Scheme supply date	Date of proposed intervention	Date	Delphi
Treat		Treatment type	Existing treatment type from lookup table	Lookup Value	Delphi
WTP_Nam		WTP name	Name of water treatment plant	Text Description	Delphi
Conn		Connection	Type of water connection from lookup table	Lookup Value	Delphi
Design_E		Existing design demand	Demand for which this scheme has been designed	Million m ³ p.a.	Infrastructure Manager/ MIG/ WIG/IDP/Housedold Data/Stats Data
Dem_L		Demand Low	Low demand forecast	Million m ³ p.a.	Infrastructure Manager/ MIG/ WIG/IDP/Housedold Data/Stats Data
Dem_H		Demand High	High demand forecast	Million m ³ p.a.	Infrastructure Manager/ MIG/ WIG/IDP/Housedold Data/Stats Data
Dem_P		Probable demand	Probable demand forecast	Million m ³ p.a.	Infrastructure Manager/ MIG/ WIG/IDP/Housedold Data/Stats Data
Supp_E		Existing supply	Current water supply capacity	Million m ³ p.a.	Infrastructure Manager/ MIG/ WIG/IDP/Housedold Data/Stats Data
Supp_R		Water requirements	Current water requirements	Million m ³ p.a.	Infrastructure Manager/ MIG/ WIG/IDP/Housedold Data/Stats Data
Supp_F		Future water requirements	Future water requirements	Million m ³ p.a.	Infrastructure Manager/ MIG/ WIG/IDP/Housedold Data/Stats Data
Proj_ID		Project ID	ID of project if known	Text Description	Delphi
HH_Low		Households low	Lowest estimate of households served	Number	Infrastructure Manager/ MIG/ WIG/IDP/Housedold Data/Stats Data
HH_High		Households high	Highest estimate of households served	Number	Infrastructure Manager/ MIG/ WIG/IDP/Housedold Data/Stats Data
Pop_Low		Population low	Lowest estimate of number of people	Number	Household Data/Stats Data
Pop_High		Population high	Highest estimate of number of people	Number	Household Data/Stats Data
Capturer		Capturer	Person who captured the area from lookup table	Text Description	Delphi
Sanitation		Type of sanitation scheme	Type of sanitation scheme from lookup table	Lookup Value	Delphi
Comments		Comments	General comments	Text Description	Delphi

Water Supply Footprints - Delphi

Field Name	SMEC Field	Alias	Description	Units	Source
Short_SS	Wat_Supp	Short term supply status	Defines existing supply status	Y/N	Delphi
	Sust_2016		Is existing supply sustainable to 2016?	Y/N	Delphi
	Sust_2016Need		If N, What needs to be done to ensure sustainable supply to 2016?	Text Description	Delphi
Schm_E		Existing scheme name	Name of any existing supply scheme	Text Description	Delphi
Schm_F		Future scheme name	Name of any future proposed scheme	Text Description	Delphi
Sou_E		Existing source	Existing water source from lookup table	Lookup Value	Delphi
Sou_F		Future source	Future water source from lookup table	Lookup Value	Delphi
WatNam_E		Existing source name	Name of existing source	Text Description	Delphi
	W_Capacity	W_Capacity	Source Capacity	ML	Delphi
	HoldingRes	HoldingRes	Holding Reservoir / Feeding Reservoir	Text Description	Delphi
WatNam_F		Future source name	Name of future source	Text Description	Delphi
Proj_Typ		Project type	Type of project from lookup table	Text Description	Delphi
SuppDate		Scheme supply date	Date of proposed intervention	Date	Delphi
Treat		Treatment type	Existing treatment type from lookup table	Lookup Value	Delphi
WTP_Nam		WTP name	Name of water treatment plant	Text Description	Delphi
Conn		Connection	Type of water connection from lookup table	Lookup Value	Delphi
	W_Material	PipeType	Pipe Material	Text Description	Delphi
	W_Diameter	Diameter	Average Diameter	Text Description	Delphi
	AvgDist	AvgDist	Average Distance to Water Source	Text Description	Delphi
Proj_ID		Project ID	ID of project if known	Text Description	Delphi
Sanitation		Type of sanitation scheme	Type of sanitation scheme from lookup table	Lookup Value	Delphi
	WWTW_N	WWTW_N	WWTW Name	Text Description	Delphi
	S_Capacity		WWTW Capacity	Text Description	Delphi
	S_Material		Pipe Material	Text Description	Delphi
	S_Diameter		Average Diameter	Text Description	Delphi
Comments		Comments	General comments	Text Description	Delphi
	Confid	Confid	Level of Confidence	Text Description	Delphi
Capturer		Capturer	Person who captured the area from lookup table	Text Description	Delphi

Bulk Pipelines

Field Name	Alias	Description	Units	Source
Schm_E	Scheme Name	Name of the supply scheme	Text Description	Delphi
Sou_E	Water source	Type of Water source from lookup table	Lookup Value	Delphi
WatNam_E	Name of Water Source	Name of Water Source	Text Description	Delphi
Diameter	Diameter	Diameter of Pipeline	Text Description	Delphi
Flow	Flow	Flow type - Gravity/ Pumped	Lookup Value	Delphi
Functionality	Functionality	Operational functionality of the pipeline	Lookup Value	Delphi
Age	Age	Age of the pipeline	Text Description	Delphi
Capturer	Capturer	Data capturer from lookup table	Text Description	Delphi
Comments	Comments	General comments	Text Description	Delphi

Supply Source

Field Name	Alias	Description	Units	Source
Schm_E	Scheme Name	Name of the supply scheme	Text Description	Delphi
Type	Type	Type of Source	Lookup Value	Delphi
Elevation	Elevation	Elevation of Source	Text Description	Delphi
Functionality	Functionality	Operational functionality of the pipeline	Lookup Value	Delphi
Age	Age	Age of the pipeline	Text Description	Delphi
Capturer	Capturer	Data capturer from lookup table	Text Description	Delphi
Comments	Comments	General comments	Text Description	Delphi

Meters

Field Name	Alias	Description	Units	Source
Schm_E	Scheme Name	Name of the supply scheme	Text Description	Delphi
Functionality	Functionality	Operational functionality of the pipeline	Lookup Value	Delphi
Age	Age	Age of the pipeline	Text Description	Delphi
Capturer	Capturer	Data capturer from lookup table	Text Description	Delphi
Comments	Comments	General comments	Text Description	Delphi

Reservoirs

Field Name	Alias	Description	Units	Source
Schm_E	Scheme Name	Name of the supply scheme	Text Description	Delphi
Sou_E	Water source	Type of Water source from lookup table	Lookup Value	Delphi
WatNam_E	Name of Water Source	Name of Water Source	Text Description	Delphi
Capacity	Capacity	Capacity of the Reservoir	Text Description	Delphi
Diameter	Diameter	Diameter of Pipeline	Text Description	Delphi
Flow	Flow	Flow type - Gravity/ Pumped	Lookup Value	Delphi
Functionality	Functionality	Operational functionality of the pipeline	Lookup Value	Delphi
Age	Age	Age of the pipeline	Text Description	Delphi
Capturer	Capturer	Data capturer from lookup table	Text Description	Delphi
Comments	Comments	General comments	Text Description	Delphi

Pumps

Field Name	Alias	Description	Units	Source
Schm_E	Scheme Name	Name of the supply scheme	Text Description	Delphi
Qty	Qty	Number of pumps	Text Description	Delphi
Capacity	Capacity	Capacity of the pump	Text Description	Delphi
Functionality	Functionality	Operational functionality of the pipeline	Lookup Value	Delphi
Age	Age	Age of the pipeline	Text Description	Delphi
Capturer	Capturer	Data capturer from lookup table	Text Description	Delphi
Comments	Comments	General comments	Text Description	Delphi

Lookup Values

Water Footprints

Field Description	Field Name	Lookup Description	Lookup Value
Existing Source	Sou_E	Local Water Scheme	1
		Borehole	2
		Water Tanker	3
		Regional Water Scheme	4
		Spring	5
		Reservoir	6
Future Source	Sou_F	Local Water Scheme	1
		Borehole	2
		Water Tanker	3
		Regional Water Scheme	4
		Spring	5
		Reservoir	6
Water Treatment Type	Treat	WTP	1
		Chlorination	2
		Sand Filter	3
		Package Plant	4
Type of Water Connection	Conn	House	1
		Jojo	2
		Standpipe	3
Type of Sanitation Scheme	Sanitation		
Flow	Flow	Gravity	1
		Pumped	2
Functionality	Functionality		
Project Type	Proj_Typ	MWIG	1
		UW	2

Annexure D

uMgungundlovu District Municipality Water & Sanitation Project List

Water, Sanitation and Infrastructure Projects	Municipality	2013/2014				2014/2015		2015/2016
		MIG	MIG Front Load	Massification	Other Grants	Total Projected MIG	Total Projected Other	Total Projected MIG
Camperdown Treatment Plant	KZ226				R 4 267 693			
Gomane Sanitation	KZ224	R 3 128 160						
Appelsbosch Rehabilitation	KZ221							
Mpofana Rehabilitation	KZ223							
Mpophomeni Sanitation Scheme Waste Water Works	KZ222	R 9 665 177				R 24 000		
Umshwathi Slump Bulk Sewer	KZ221							
Dalton/Cool Air Bulk Sewer	KZ221							
Craigieburn Sanitation	KZ223							
Richmond Waste Water Treatment Works Upgrade	KZ227							
Impendle Bulk Sewer Reticulation	KZ224							
Mkhambathini WWTW	KZ226	R 44 811 361			R 10 000 000			
Khayelisha Housing Project				R 13 776 736				
Mpofana Waste Water Treatment Works	KZ223							
Greater Eston Water Supply	MULTIPLE				R 15 000 000			
Ukhalo Water	KZ224	R 21 603 282					R 6 893 332	
Water Purification Plant					R 2 244 800			
Regional Bulk Infrastructure					R 38 000 000			
New Waste Water Plant	Richmond				R 15 000 000			
Gengeshe Water Supply Scheme Implementation Phase								
Muden Water planning phase	Mooi Mpofana							
Muden Ward 4 Water Supply Scheme Implementation Phase								
Smilobha, Phindangene, Lindokuhle & Fikesuthi Water Supply	KZ224							
Mbhava and Mpethu Water Supply								
Ephatheni Water								
Maqongqo Bulk and Reticulation Water Supply Project	KZ226							
Maqongqo Bulk and Reticulation Water Supply Project Phase 2	KZ226							
Maqongqo Bulk and Reticulation Water Supply Project Phase 3	KZ226							
Maqongqo Bulk and Reticulation Water Supply Project Phase 4	KZ226							
Impendle LM Bulk Water Supply	KZ224	R 19 664 020				R 11 839 998		
Enguga, Entshayabantu and Macksam Water Supply - Phase 4	KZ224							
Enguga, Entshayabantu and Macksam Water Supply - Phase 5	KZ224							
KwaNovuka Water Supply Second AFA	KZ224							
Craigieburn/ Mshwathi Housing - Bulk Water Scheme		R 9 516 579					R 30 501 252	R 8 150 000
Nkangala Water Supply Scheme Implementation Phase								
Lindokuhle Mpolweni Water	KZ221							
Umshwathi Reg Bulk Supply	KZ221		R 69 948 794			R 80 710 960		
Umshwathi Slum Water	KZ221							
Dalton/Cool Air Water	KZ221							
Cedara Bulk Services	KZ222							

Water, Sanitation and Infrastructure Projects	Municipality	2013/2014				2014/2015		2015/2016
		MIG	MIG Front Load	Massification	Other Grants	Total Projected MIG	Total Projected Other	Total Projected MIG
Nhlambamasoka, Nhlathimbe & Khathikathi								
Ebuhleni Housing Project Community Water Supply Scheme								
St Bernard's Housing Development Bulk Water								
Amanda's Hill Housing Development Bulk Water								
Zwelethu Housing								
Total Project Breakdown		R 108 388 579	R 69 948 794	R 13 776 736	R 84 512 493	R 92 574 958	R 37 394 584	R 8 150 000
Water Projects		R 50 783 881	R 69 948 794	R -	R 70 244 800	R 92 550 958	R 37 394 584	R 8 150 000
Sanitation Projects		R 57 604 698	R -	R 13 776 736	R 14 267 693	R 24 000	R -	R -