UMJINDI MUNICIPALITY

WATER SERVICES DEVELOPMENT PLAN

REVISION 1

SEPTEMBER 2006

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Final

EXECUTIVE SUMMARY

The Umjindi Municipality commissioned Masakhe Isizwe Engineers (Pty) Ltd to compile the first revision of the Water Services Development Plan (WSDP) for their area of jurisdiction.

Umjindi is situated in the Mpumalanga province and falls within the jurisdiction of the Ehlanzeni District Municipality (EDM).

The Umjindi Municipality is the owner of the water and the sanitation bulk and link infrastructure. The bulk and link infrastructure have been built and is operated and maintained by the municipality. Hence there are no schemes to be transferred from the Department of Water Affairs and Forestry. The Umjindi Municipality has the institutional and financial capacity to operate and maintain the existing water and sanitation infrastructure.

The Umjindi Municipality has implemented a policy with regard to the provision of free basic water and sanitation services. In terms of the physical and socio-economic profile water and sanitation has been provided to most of the urban and dense rural settlements within the municipalities' area, i.e. Barberton and Emjindini. However a number of rural villages have to be provided with basic water and sanitation services at Lomshiyo, Shiyalongubu, Sheba Siding and Emjindini Trust. Currently projects are underway for the provision of basic water services in Verulam and Sheba Siding.

Large numbers of families have migrated to the area over the last 20 years. A large proportion of the population (37%) is below the age of 18 years, which will increase the demand on the natural resources in area dramatically in the next 10 to 20 years. Further 19% of the eligible work force is unemployed. Approximately 81% of the households in the area have a monthly income of less than R1500, and can thus be classified as poor. The agricultural and mining sectors contribute the most towards economic activity (42% of GGP) in the region. Opportunities with regard to tourism development, jewellery manufacturing and food processing can be utilised to promote economic development in the region.

The service level targets have been set for the Municipality. The municipality will endeavour to provide basic water services to all its consumers within the next 5 years. Several rural areas have been identified for and actions have been taken to ensure that water is provided to them. It is recommended that the status of the service levels for each community be captured in a geographical information system (GIS) that can be updated on a frequent basis.

The following water supply schemes are located in the Umjindi Municipality region:

a) The Barberton water supply scheme provides potable water to Barberton, Emjindini, Verulam and the Prison Farm from the Lomati dam and the Suid Kaap River;

b) The Sheba siding water supply scheme provides potable water to the Sheba Siding community from the Figtree Creek;

c) The Low's Creek irrigation scheme that get water from the Shiyalongubu Dam and the Kaap River;

d) Water supply schemes for the Agnes, Fair View, Consort and Sheba gold mines;

e) River pumping installations of several farmers associated with the Noord Kaap, Suid Kaap, Queens River, Eureka and Low's Creek Irrigation Boards.

The Umjindi Municipality is supporting the construction of a dam by private developers in the Concession Creek. Feasibility studies have been completed for the dam and the application for the water rights has been submitted to the Department of Water Affairs and Forestry.

More information needs to be obtained with regard to the underground water resources that are being used in the municipal area. Consumers have experienced no ground water quality problems and the ground water in the municipal region is of a good quality.

The capacity of the sewerage treatment works for Barberton and Emjindini has to be increased in due course to provide for the development of sanitation in the further extensions of Emjindini. The permit for the sewage works is also not balanced with regard the permits for the bulk water supply of Barberton and Emjindini. The quality of water for the urban sources is monitored and is acceptable in terms of SABS 241.

A model has been suggested for effective water conservation and demand management by the municipality. The municipality has identified areas where water conservation could be improved. The water losses within the municipal area are acceptable. The water reticulation network in Barberton needs to be analysed and pressure zones need to be designed and implemented to equalise the pressures in the system.

The existing water services infrastructure has been mapped as indicated in the Appendices. The Barberton water supply system has sufficient capacity at present for the existing water demand. The future supply must be upgraded to meet the future demand.

The rural villages do not have an organised or planned water supply at present. The Umjindi Municipality uses no ground water infrastructure. The existing ground water infrastructure used by private institutions and farmers are not known to the municipality.

The total length of bulk pipelines for the Barberton water supply scheme is some 45km of piping with diameters ranging from 75mm to 400mm. Additional reservoir storage of 3 Ml is required to balance the present water demand with the storage capacity. To provide the required storage it is necessary to construct a 3Ml reservoir for Barberton. The existing Pilgrim reservoir should be replaced by a 1Ml reservoir. The Barberton water supply scheme is served with a water reticulation network that is sufficient to provide a basic service level. i.e. standpipes with a maximum walking distance of 200m to all the residents in Barberton and Emjindini. Water reticulation networks have to be provided for rural villages and the existing AC pipelines in Barberton should be replaced to avoid further water losses.

The new bulk and link infrastructure to be built is indicated in Appendix G. Table 51 of Appendix A provides a list with estimated costs for the proposed new bulk and link infrastructure. Provision has to be made for the bulk and link water supply of the areas to be upgraded from squatter status to formal residential status. These include Emjindini

Extension 13. Bulk water and sewer also has to be supplied to Emjindini Extension 12. Emjindini can be supplied from the present Barberton water supply system, but the provision will have to be made for additional bulk water supply systems to provide water to the residents of Emjindini Trust, Lomshiyo Trust, Sheba siding and Shiyalongubu.

The Umjindi Municipality is currently the Water Services Authority (WSA) in terms of the Water Services Act. The Model Bylaws suggested for adoption by the Umjindi Municipality is given in Appendix 1. The Municipality is currently also the Water Services Provider (WSP) and it is envisaged that the Municipality will continue to act as the WSP in the medium to long-term future.

The Umjindi Municipality has implemented a free basic water system. The municipality has a fully-fledged accounting system in operation. Accounts are rendered monthly for water consumption and sanitation services. Tariffs for all water and sanitation services have been implemented. The non-payment rates are acceptable and the municipality has a positive income relating to water and sanitation services.

The Umjindi Municipality has identified new capital projects to the value of approximately R87 million relating to water and sanitation services.

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LIST OF ANNEXURES

LIST OF DRAWINGS

UMJINDI MUNICIPALITY WATER SERVICES DEVELOPMENT PLAN

A ADMINISTRATION

A.1 Name of the Water Services Authority (WSA)

The Water Services Authority (WSA) for the Umjindi Municipal region is the Umjindi Municipality.

A.2 Status of the WSDP

Status	Reference date	Date submitted
Annual	August 2006	

A.3 WSDP Drafting Team

A3.1 Water Services Authority

Compo-nents	Chapter	Name	Designation	Role	Contact address and number
		G Treurnich	Director Technical Services		PO Box 33, Barberton, 1300 (013) 712 2121
All	All	F de Wet	Assistant Director Technical Services	WSDP Coordinator	PO Box 33, Barberton, 1300 (013) 712 2121

A3.2 Consultants

Compo-nents	Chapter	Name	Designation	Role	Contact Address and Number
All	All	SW Raath	Team Leader	WSDP compiler	PO Box 514, Nelspruit, 1200 (013) 753 2535

A.4 Processes Followed

Process and Communication application	Date	Comments

A.5 Comments

Components	Interest Group	Considerations	Comments

A.6 Adoption Record

Components	Action	Approval Reference	Date

A.7 WSDP Coordinator

Name	Designation	Role	Contact Address
F de Wet	Assistant Director Technical Services	Coordinator from the WSA	PO Box 33, Barberton, 1300 (013) 712 2121

A.8 Project Management Function (PMU)

	Yes	No	N/A	Comment
Is there budget?	X			
Are there By-laws?	X			
Is there infrastructure?	X			
Personnel available		X		

A.9 DWAF Asset Transfer Agreement

	Yes	No	N/A	Comment
Has the transfer agreement been signed?			X	All the infrastructure are owned and operated by the Umjindi Municipality
Date signed "effective date"?			X	
Is there a budget?			X	
Are there By-laws?			X	
Is there infrastructure?			X	
Personnel available			X	

A.10 General

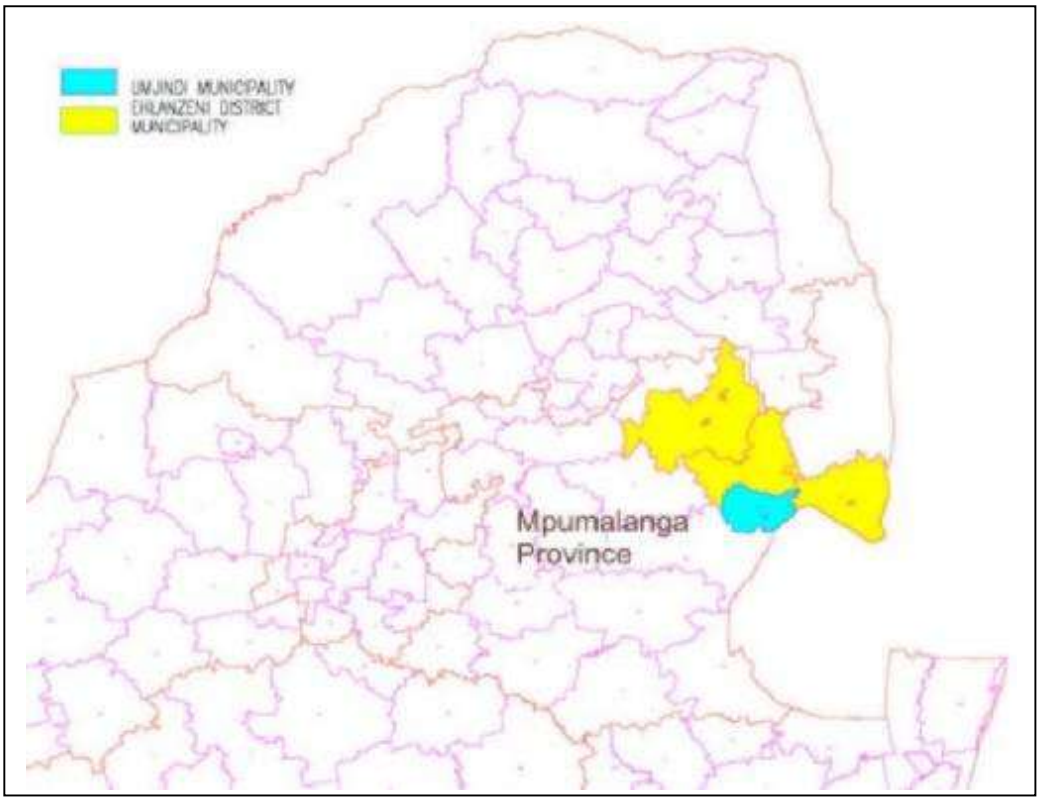
A10.1 Service level policy

	Yes	No
Does the WSA have a Service level policy for water?	X	
Does the WSA have a Service level policy for sanitation?	X	
If no, when will such a policy be in place?		
Does the WSA have a Community participation plan for the selection of a service level?	X	
If no, when will such a plan be in place?		

B BACKGROUND TO THE AREA

B.1 Location

The Umjindi Municipality is located within the Mpumalanga Province as indicated in Appendix B and the image below.



B.2 Water Services Authority Perspective

The Umjindi region is governed by the Umjindi Municipality, which falls within the boundaries of the Ehlanzeni District Council.

The villages within the jurisdiction area are Barberton, Emjindini, Emjindini Trust, Verulam, Sheba Siding, Louw's Creek, Prison Farm, Lomshiyo Trust and Shiyalongubu.

Barberton and Emjindini can be classified as Urban Settlements. Some private residential urban areas have been developed for staff housing by the gold mines at Consort and Fair View. A residential urban area is also located at the Prison Farm not far from Barberton.

Areas in Emjindini are also classified as Dense Rural Settlements while the settlements of Verulam, Emjindini Trust and Lomshiyo Trust are classified as Rural Villages.

Rural Scattered Villages are situated in the forestry areas such as Nelshoogte, Highlands, Montrose, Inloop and Glenthorpe. A Scattered Village is also located at the Shiyalongubu Dam.

Several farms are located within the Umjindi Area and are classified as Farmland.

The land use within the Umjindi Area is mainly forestry and farmland. Farmers consist of small scale sugarcane farmers, wildlife farming and banana farms.

B.3 Physical Perspective

B3.1 Topography

The topography of the area varies from Mountainous, Rolling and Flat. Most of the settlements are situated on the Rolling and Flat areas, which do not have a severe impact on service delivery

B3.2 Climate

The average annual rainfall for this region is approximately 738mm according to the rainfall records obtained from the South African Weather Bureau. The rainy season is between November and March.

The average daily maximum temperature is 28.8°C and the average daily minimum temperature is 13.8°C.

B3.3 Natural environment

There are several nature reserves in the Umjindi area. These are Mountainlands Nature Reserve, Barberton Townlands, Tinie Louw, Songimvelo, Queens river and Barberton Nature Reserve.

B3.4 Main infrastructure development

- Police Stations are situated within Barberton & Low's Creek. The Barberton Police station is serviced with water and sanitation services from the town's municipal infrastructure. Low's Creek police station has a borehole supplying water and a septic tank system for sewage;

- Magisterial Offices are situated within Barberton and served by the towns municipal water and sanitation system;

- Schools are situated within Barberton and Emjindini and consist of Primary and Secondary Schools. They are served by the towns municipal water and sanitation system;

- Clinics are situated in Barberton, Low's Creek and Emjindini. The gold mines in the area provide health care facilities for their employees.

  The Barberton and Emjindini clinics are served by water and sanitation services through the towns municipal infrastructure. The Low's Creek clinic has a borehole supplying water and a septic tank system for sewage;

- Hospitals are situated in Barberton. There is a Provincial and a Private Hospital, both are served by the towns municipal water and sanitation infrastructure;

- Prisons are in Barberton and on the Prison Farm just outside Barberton. The municipality provides water to both the facilities and sanitation services to the prison in town. The prison farm is responsible for their own sanitation services;

- Barberton has an industrial area situated on the outskirts of town adjacent to Emjindini. Some of the larger industrial concerns are the Lomati Woodworkers (SAPPI), Senteeko Tea Estate and Chevron Engineering. The municipality provides water and sanitation services to the are;

- Gold, clay and talc are mined in the Umjindi area, with small-scale mining of barite and verdite also taking place in scattered locations. The mines are responsible for their own water and sanitation services for domestic and other needs.

With regard to the agricultural sector there is a shift taking place towards the cultivation of sugar cane in the valley. Cattle farming also take place in the valley and the town has strong linkages with the forestry industry in the mountain areas between Barberton and Swaziland.

The farms obtain most of their water from the main rivers in the municipality i.e. the Noordkaap, Suidkaap, Queens and Kaap River. Boreholes are mainly used for primary and domestic use while the surface water abstracted from the rivers is used for irrigation. The Low's Creek irrigation scheme uses the water from the Shiyalongubu dam for irrigation.

Several game lodges were established in the area recently. Within Barberton there are hotels, guesthouses, camping and caravan sites. The Municipality provide water and sanitation services to the places within the town, while the game and other lodges are responsible for their own services;

Several conservation areas can be found in the Umjindi area. Two of the larger areas are situated in the mountains between Barberton and Swaziland nl. Mountainlands Nature Reserve and Songimvelo Nature Reserve. Other smaller areas are Barberton -, Barberton Townlands -, Tinie Louw -, Queensriver -, Nelsberg -, Dr. Hamilton – and the Nelshoogte Nature Reserve.

The forestry villages are not served with water and sanitation services by the Municipality. SAPPI is responsible for these services as they are the current owners and operators of the villages. Some of the villages uses a borehole –septic tank system and other draws water from the mountain streams and uses a septic tank system.

The mines in the area (Sheba, Barbrook, New Consort & Fairview) are responsible for their own water supply and sanitation services. Most of the potable water for the mine villages, offices and hostels are abstracted from rivers and boreholes. Sheba mine however use fissure water from level 19 shaft for the village, hostel and plant.

Fairview mine's sewage flows to the Barberton Sewage Works, the rest of the mines use septic tank systems for sewage treatment.

B.4 Demographic Perspective

B4.1 Economics

The economy of Umjindi is dominated by agriculture, mining and to a lesser extent by manufacturing activities. A conclusion that can be made from the information for the region is that the industrial sector (16.4% to GGP) is small in relation to that of primary sector activities, i.e. agriculture and mining (respectively 30.8% and 11.2% to GGP). Very little beneficiation/value adding takes place in the local economy and most primary products are exported from the region. There are a number of inherent development opportunities in the Barberton economy related to primary products and value adding.

- In Barberton, agriculture and forestry are the sectors with the highest growth potential and contributes 30.8% to GGP. The agricultural sector achieved an average annual growth rate of 3.4% or more since 1985.

In terms of growth, agriculture has out-performed all other sectors in the economy achieving an average growth rate of 3.4% per annum since 1985. The fact that Barberton is a prime agricultural area is furthermore affirmed by its high location quotient of 6.7, which means that the area has a competitive disadvantage in terms of agricultural production.

At present much of the economy is the region is based on the agricultural sector and the importance of this sector, as an employment creator should be recognised.

- The mining sector includes the mining and quarrying of metallic minerals (coal, lignite, gold, cranium ore, iron ore, etc); extraction of crude petroleum and natural gas, service activities incidental to oil and gas extraction; stone quarrying; clay and sand pits; and the mining of diamonds and other minerals.

Gold, clay and talc are mined in the Barberton area, with small-scale mining of barite and verdite also taking place in scattered locations.

The mining sector, which contributes 11.2% to GGP, has however performed negatively over the long term, i.e. since 1985. Still, the location quotient remains high (1.4), indicating that mining in Barberton is important to the local economy as well as to the South African economy as a whole.

Mining is of strategic importance to the economy due to Barberton's history as a mining town. Not only does it have the oldest gold mine in South Africa, but also the richest in terms of grain gold per volume extracted.

An issue of considerable concern is the fact that the current and anticipated future declines of the mining sector in the sub-region will create additional unemployment and will result in even more socio-economic hardships. Furthermore, there is no real prospect at present that these job losses can be made-up elsewhere in the

mining sector within the sub-region. Therefore, alternative source of employment, especially in economic activities that do not specifically require highly skilled personnel, should be vigorously pursued.

- Manufacturing in the municipal area includes, inter alia, the manufacturing of food products, beverages and tobacco products; production, processing and preserving meat, fish, fruit, vegetables, oil and fats, dairy products and grain mill products; textile and clothing; spinning and weaving; tanning and dressing leather; footwear; wood and wood products; paper and paper products; printing and publishing; petroleum products; nuclear fuel; and other chemical substances. The sector furthermore includes the assembly and installation of machinery and equipment, as well as specialised repair shops, including engineering workshops.

Manufacturing is the second largest sector in the Barberton economy, contributing 16.4% to GGP. As the location quotient may suggest, the area poses few agglomeration advantages for industrial location. Industrial location is furthermore curbed by difficult road access to and from main commodity markets.

- The trade, catering and accommodation sectors each contribute approximately 10% or more to the GGP and have achieved an average annual growth rate of 1.5% or more since 1985.

The trade sector includes wholesale and commission trade; retail trade; repair of personal household goods; sale, maintenance and repair of motor vehicles and motor cycles; hotels, restaurants, bars, canteens, camping sites and other provision of short stay accommodation.

The trade sector is important to the local economy due to the diverse nature of activities in its composition: not only does it include retail trade, but also the bulk of tourism and related activities (as outlined above). Trade contributes 11.2% to GGP in the local economy.

Economic trends

With regard to the agricultural sector there is a shift taking place towards the cultivation of sugar cane in the valley. Cattle farming also take place in the valley and the town has strong linkages with the forestry industry in the mountain areas between Barberton and Swaziland.

The following opportunities exist with regard to agriculture:

- Small scale farming in products outlined above holds potential due to a number of reasons, including fertile soil; the success with which these products are currently cultivated in the area; and consequently the relatively lower risk profile associated with the funding of new farming ventures;

- Economic linkages with, for example, agro-industries. Such activities may include, inter alia, the production of dried fruit and nuts, miscellaneous high quality leather products (related to cattle, game as well as the crocodile farm) and furniture.

Other products that may be considered for cultivation in the Barberton area due to ideal climate conditions include paprika and garlic. There is a growing world market, in particular paprika, due to its natural qualities and multifunctional use as spice and colorant.

The mining sector is on the decline in Umjindi; although the industry will still play a major economic role for a long time to come.

Apart from primary/basic/first round processing, there are no manufacturing plants in Barberton that add value to locally mined minerals. The following opportunities, in particular, may be developed to facilitate local beneficiation of mining and quarrying products:

- Construction materials and brick making;
- Jewellery manufacturing after the gold has been processed.

Another opportunity that is already emerging in the market and that may be further exploited is small-scale mining operations. The scope for market entry is, however, limited due to land and mineral rights ownership constraints.

Yet another opportunity relates to the economic linkages between mining and tourism. The concept "the oldest and richest gold mine in South Africa" may be combined to great effect with the development of old mining facilities into tourist attractions. Similar successes have been achieved at gold Reef City and Pilgrim's Rest. Other aspects that enhance the uniqueness of Barberton in this respect include the Barberton Greenstone Belt rocks, which are to believe to be some of the oldest geological formations on earth.

With regard to manufacturing three types of activities dictate the industrial profile of the town, namely:

- Food industries - 33.3%
- Wood and wood products - 26.7%
- Non-metallic mineral products - 13.3%

Products exported from the sub-region are mostly of an intermediate nature, i.e. not final products but products that serve as inputs to other manufacturing processes. In this trend lies the latent potential for local beneficiation, albeit on a small scale. These activities are directly related to primary products or resources produced in the area. The establishment of small-scale beneficiation plants will not only increase the value of exports from the sub-region, it will also create economic empowerment opportunities for local entrepreneurs.

With regard to trade, catering and accommodation the present economic situation is such that several people turn to the mushrooming informal economic sector for an additional income. This sector is contributing significantly to the economy and provides a substantial number of employment opportunities.

In most cases these activities are acceptable to the neighbours in the community, and if properly managed, are complimentary to the surrounding land uses and not

of a noxious kind. However, not all members of the community are as considerate as these and practice noxious activities which are causing health hazards, noise at inconvenient hours and which are not aesthetically acceptable to the surrounding community.

The trade sector in Barberton has, over the years, developed to cater for the day-today needs of local residents. Growth of the tourism industry in the region will inevitably increase the demand for trade and related activities. In this respect, the supply of new facilities should focus on niche markets and novel concepts to avoid duplication of existing facilities.

B4.2 Social

The survival of a large portion of the community is dependent on migration workers, where a member or members of a family work elsewhere and forward money occasionally to the family members.

The study area is stable in terms of the out-migration of people, as the majority of households have stayed in their current village for 20 years or longer.

Large numbers of families migrated to the municipality in recent years.

B.5 Regional Perspective

The Umjindi Municipality is situated in the Ehlanzeni District Municipality. It is bordered on the Northern side by the Mbombela Municipality, the Nkomazi Municipality on the Eastern side, Swaziland on the Southern side and Albert Lethuli Municipality on the Western side.

The Umjindi Municipality is situated in Barberton approximately 40km from Nelspruit the capital of Mpumalanga.

C IDP AND WSDP GOALS AND INTEGRATION

The Water Services Development Plan of the Umjindi Municipality area has been linked with the Integrated Development Plan of the same Municipality. The Water Services Development Plan is addressing the water issues of the Integrated Development Plan

C.1 IDP priority issues related to water services

The table below indicates the IDP priority issues related to water services.

IDP priority issues which impact on water services	IDP objectives related to water services
Clean drinking water on farms and settlements	Develop water infrastructure and assist land owners with the provision of potable water.
Basic sanitation facilities for rural communities	Develop sanitation infrastructure for rural communities.
Insufficient bulk water available in some areas	Provide bulk water infrastructure during the next 5 to 10 years.

A summary of the objectives of the IDP and comments in terms of the WSDP is indicated in the table below.

IDP Objective	WSDP Objective	Comment
Develop water infrastructure and assist land owners with the provision of potable water.	To provide basic water services for all. To provide an acceptable quality water to all communities.	It should be possible for the Umjindi Municipality to provide basic water services to RDP standard to all communities.
Develop sanitation infrastructure for rural communities.	To provide basic sanitation services for all.	The intention is that each family should have at least a VIP or pit latrine.
Provide bulk water infrastructure during the next 5 to 10 years.	To provide basic water services for all.	It will be possible to provide all the bulk water supply needs within the next 10 years.

C1.1 Provincial Growth & development strategy issues

C.2 Sustainable water services sub-goals

- **Provision of basic water services**
  Provide basic water services and free basic water to all consumers and to provide acceptable quality water to all communities.

- **Provision of basic sanitation services**
  Provide basic sanitation services to all communities.

- **Higher levels of water services**
  Upgrade existing basic water services where communities can afford a higher level of service

- **Higher levels of sanitation services**
  Upgrade existing basic sanitation services where communities can afford a higher level of service.

C.3 Integrated water resource management sub-goals

- **Water resource protection**
  Prevent the over exploitation of water resources and protect water resources against pollution.

- **Water resource conservation**
  Conserve surface water and underground water sources. Adequate measures should be taken to involve the community in the eradication of harmful plants.

- **Demand management**
  Implement a demand management strategy that will minimise water wastage and contamination.

Implement a cost recovery system with the co-operation of communities. Install water meters and improve record keeping controls. The record keeping of water meters must be integrated and balanced with the consumer records of the accounting department.

The demand management system be monitored in terms of key indicators on a quarterly basis

C.4 Efficient and effective water services institutional arrangements sub-goals

- **Water services authority (WSA) overall capacity**
  Improve the capacity of the Umjindi Municipality with regard to water supply services. Develop a GIS of existing services in all communities in the municipal area.

- **Water services provider (WSP) institutional arrangements**
  Employ water service providers to assist with the effective and efficient management of water services

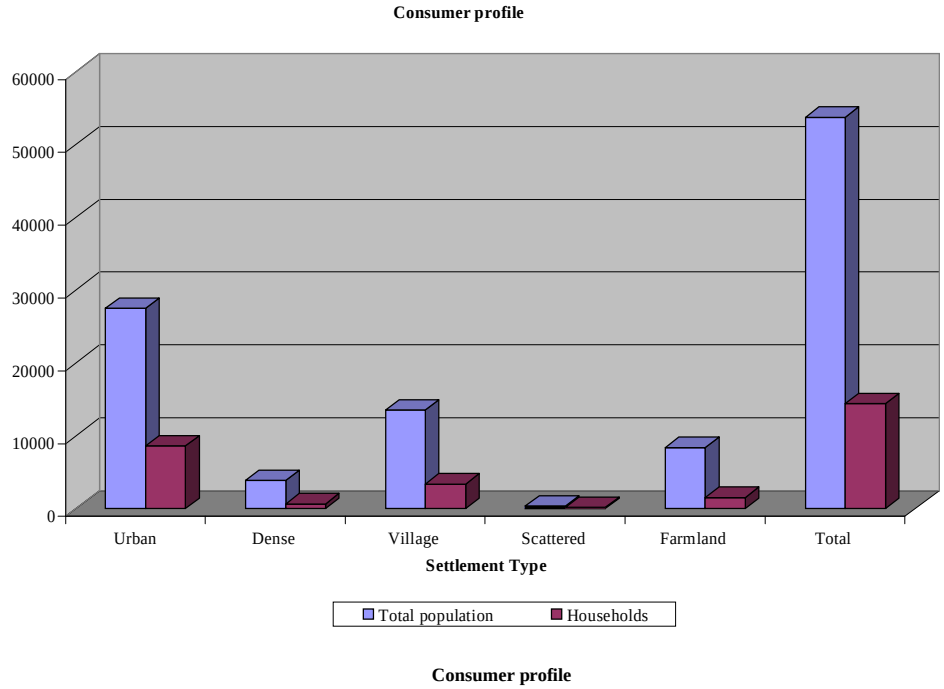
1 SOCIO-ECONOMIC PROFILE

1.1 Demographics

1.1.1 Situation Assessment (Demographics)

1.1.1.1 Current Consumer Profile

The current consumer profile is indicated in Table 5 of Annexure A and the graph below.



Consumer profile

The table below indicates the present population by village name.

Place Name	Category	No of Households	Population	Average Household Size	Gender	
					Male	Female
Barberton	Urban	3010	6727	2.2	3162	3565
Emjindini	Urban	5630	20807	3.7	9779	11028
Sheba Siding	Rural: dense village	662	3872	5.8	1820	2052
Shiyalongubu	Rural: scattered	216	372	1.7	175	197
Low's Creek	Rural: village	544	1195	2.2	562	633
Emjindini Trust	Rural: village	677	3474	5.1	1633	1841
Verulam	Rural: village	736	3186	4.3	1497	1689
Lomshiyo Trust	Rural: village	554	2899	5.2	1363	1536
Kamadakwa	Rural: village	100	600	6.0	282	318
Sheba mine	Rural: village	165	369	2.2	173	196
New Consort mine	Rural: village	236	710	3.0	334	376
Fairview mine	Rural: village	217	652	3.0	306	346
Barbrook mine	Rural: village	160	481	3.0	226	255
Farms	Rural: Farmland	1552	8399	5.4	3948	4451
Total		**14459**	**53743**	**3.7**	**25260**	**28483**

1.1.1.2 Poor household definition

A poor household is defined as a household with a gross monthly income of less than R1500. Approximately 72% of the households in the area are classified as poor.

1.1.1.3 Present population and projected population growth rates

The present population and projected growth rates used for this study is 2.5%. An adjustment of -2.0% was allowed for HIV /Aids and a rate of 1.5% for economical growth. The effective population growth rate is therefore 2.0%.

Population figures were obtained from the data of the Demarcation Board and were correlated with the number of sites of the towns and villages. The projected growth rates are estimates and could vary depending on the influence of HIV/AIDS. The Umjindi Municipality had a large immigration of residents the past 8 years

1.1.1.4 Demographic trends and migration patterns

The demographic trends and migration patterns for the area is indicated in Table 5 of Annexure A.

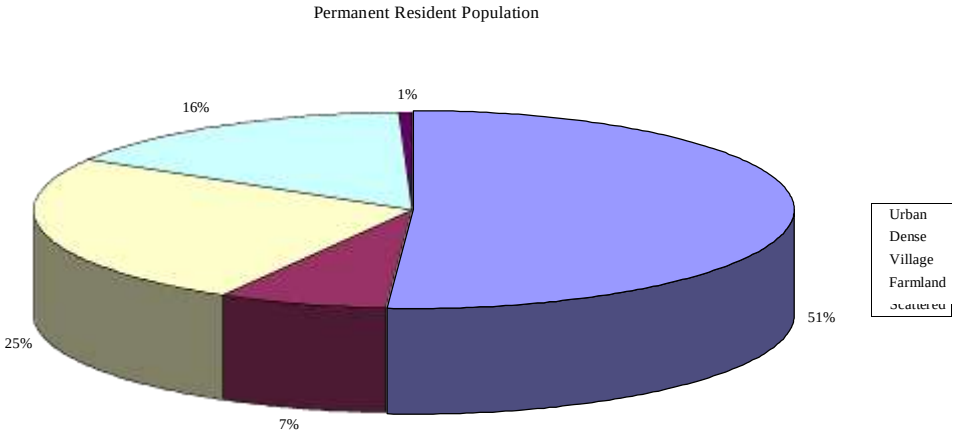
The survival of a large portion of the community is dependent on migration workers, where a member or members of a family work elsewhere and forward money occasionally to the family members.

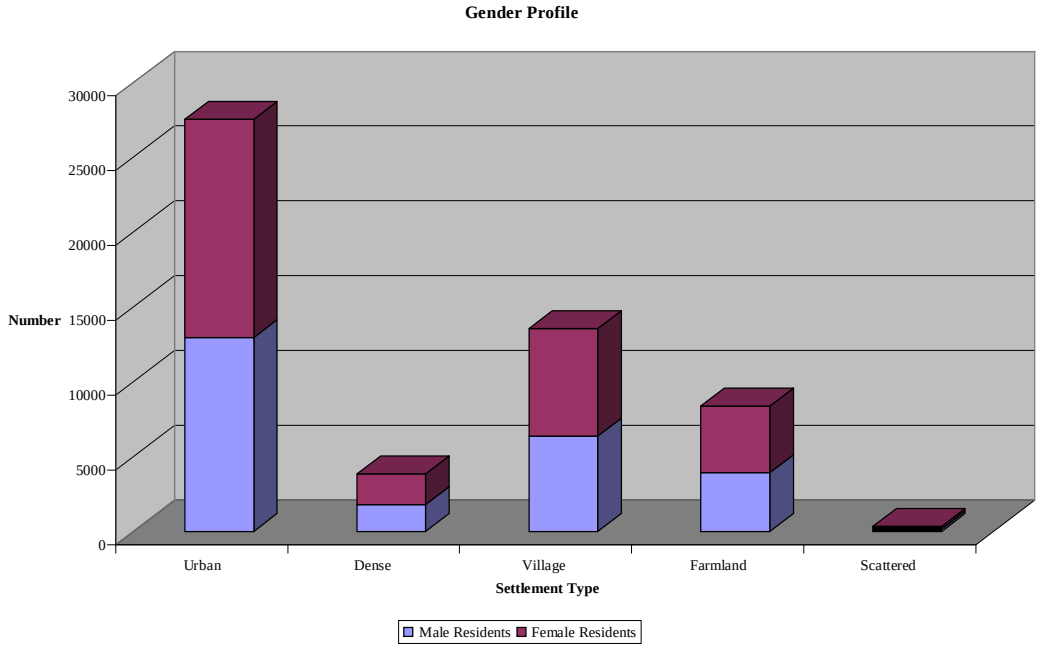
The study area is stable in terms of the out-migration of people, as the majority of households have stayed in their current village for 20 years or longer.

Large numbers of families migrated to the municipality in recent years.

1.1.1.5 Age and gender Profile

The age and gender profile for the area is indicated in Table 6 of Annexure A and in the graphs below.





From the latter table it can be concluded that a large proportion (37%) of the population is below the age of 18 years.

1.1.2 Future Trends and Goals (Demographics)

The current population of the Umjindi area is 53743 and consists of 14459 households. It is anticipated that the total population will grow to 59337 over the next five years. The effective growth rate used for the above calculation is 2% per annum. This takes the annual population & economic growth rate into account as well as an annual adjustment rate for HIV / AIDS. Table 4 in Annexure A indicates the calculations.

1.1.3 Strategic Gap Analysis (Demographics)

The demographical information used in this document is based on the Census 2001 information as published by the Demarcation board. The total population and the total households for the Umjindi Municipality were confirmed by the Municipal representative.

Some problems associated with the available information are that the Census 2001 information is not available according to settlement names. It only provides information according to the Wards of the Municipality.

The population figures for the settlements were however obtained from other sources but these will have to be verified by means of field surveys or alternatively calculated from recent aerial photographs or from a GIS system.

2 SERVICE LEVEL PROFILE

The following have been taken into account when formulating the service level policy for the Umjindi Municipality.

The types of service levels decided upon have a major impact on capital and operating costs and hence on the long-term viability of service provision. If service levels are set too high the consumers who receive them will not be able to afford to pay for them and are likely to default on their payments, which will in turn, impact on the viability of the service provider.

Service levels relate to the quantity of water used and thus there is an impact on the environment from which this water has to be abstracted and returned to.

Risks of pollution associated with the various levels of services must be considered. Lower levels of service have higher risk of pollution.

The size and density of settlements have been taken into account when deciding on levels of service. In general large settlements produce more waste and hence higher risks of pollution while pollution from smaller settlements is easier to manage.
Service level targets (set within the constraints of the service level policy) have been set as follows:

a) New consumer units - This refers to new units that will need to be provided as a result of natural population increase or migration to the area.

b) Current backlogs - This refers to those households that are currently not adequately served, for example those having a supply less than RDP standards. These consumers are mainly located in the rural villages and scattered rural areas i.e. Emjindini Trust, Verulam, Sheba Siding, Shiyalongubu and Lomshiyo Trust.

c) Upgrading - This refers to those households who currently have adequate services but who are to be upgraded to a higher level. Several extensions of Emjindini have been earmarked for upgrading.

The tables as contained in Annexure A indicate the existing and future services levels of the Umjindi Municipality.

2.1 Residential Consumer Units

2.1.1 Situation Assessment (Residential Consumer Units)

2.1.1.1 Residential Consumer Units for Water and Sanitation: Level of services

The table below indicates a summary of the residential units for water and sanitation within the study area.

Description		Above RDP	Below RDP		Total below
Quantity (Water & Sanitation)	**Def**	**25 l/c/d**	**0-10 l/c/d**	**Sanitation**	
	Pop	11891	2568	4432	7000
	%	82%	18%	31%	24%
Distance (Water)	**Def**	**0 - 200**	**200 - 500**	**> 500**	
	Pop	9190	2701	2568	5269
	%	64%	19%	18%	18%
Availability (Water)	**Def**	**98% of time**	**< 98%**		
	Pop	9190	5269		5269
	%	64%	36%		36%
Flow / Assurance (Water)	**Def**	**10 l/min**	**< 10 l/min**		
	Pop	9190	5269		5269
	%	64%	36%		36%
Quality (Water)	**Def**	**Acceptable for domestic use**	**Not acceptable**		
	Pop	11880.5	2578.5		2578.5
	%	82%	18%		18%

2.1.1.2 Residential Consumer Units for Water

The table below indicates a summary of the residential consumer units for water. From the table it can be calculated that a total of 18% (2568) of the consumer units do not have access to or have inadequate water supply.

No Consumer units with:	Urban	Rural: Dense	Rural: Village	Rural: Scattered	Rural: Farmland
1. None or Inadequate	0	112	731	216	1509
2. Communal Water Supply	1630	550	2114	0	43
3. Controlled Volume Supply	0	0	0	0	0
4. Uncontrolled Volume Supply: Yard tap or House Connection	7010	0	544	0	0
5. Total Served (2+3+4)	8640	550	2658	0	43
6. Total (1+5)	8640	662	3389	216	1552

The number of residential consumer units for water in the urban areas is indicated in Table 9 of Annexure A. The urban areas in the Umjindi Municipality are concentrated in Barberton and Emjindini. These towns are being provided with water and sanitation services that have been developed over more than 100 years. Some private residential urban areas have been developed for staff housing by the gold mines at Consort and Fair View. A residential urban area is also located at the Prison Farm not far from Barberton.

The number of residential consumer units for water in the rural dense areas is indicated in Table 10 of Annexure A. Most of these consumer units are situated in Emjindini. The facilities for these consumer units should be improved over the next 5 to 10 years.

The number of residential consumer units for water in the rural village areas is indicated in Table 11 of Annexure A. These consumer units are situated in villages that have developed over the past few years in areas like Verulam, Emjindini Trust and Lomshiyo Trust. It is the intention of the municipality to urbanise these areas and promote the development of proclaimed towns in these villages.

The number of residential consumer units for water in the rural scattered areas is indicated in Table 12 of Annexure A. Residential units in scattered areas are those situated in the forestry areas like Nelshoogte and Glenthorpe. A scattered village is also located at the Shiyalongubu dam.

The number of residential consumer units for water in the rural farmland areas is indicated in Table 13 of Annexure A. These consumers are located on the farms in the municipal area.

The farms obtain most of their water from the main rivers in the municipality i.e. the Noordkaap, Suidkaap, Queens and Kaap River. Boreholes are mainly used for primary and domestic use while the surface water abstracted from the rivers is used for irrigation. The Low's Creek irrigation scheme uses the water from the Shiyalongubu dam for irrigation.

2.1.1.3 Residential Consumer Units for Sanitation

The table below indicates a summary of the residential consumer units for sanitation. From the table it can be calculated that a total of 31% (4432) of the consumer units do not have access to or have inadequate sanitation facilities.

No Consumer units with:	Urban	Rural: Dense	Rural: Village	Rural: Scattered	Rural: Farmland
1. None or Inadequate: Below RDP: Pit	630	662	1372	216	1552
2. None or Inadequate: Below RDP: Bucket	0	0	0	0	0
3. Consumer installations: On site dry or equivalent, including VIP toilets, USD, composting system	0	0	2017	0	0
4. Consumer Installations: Wet (Septic tanks, Digester or Tanker desludge or effluent discharge to an oxidation pond)	0	0	0	0	0
5. Discharge to sewer treatment works (Intermediate or full waterborne)	8010	0	0	0	0

No Consumer units with:	Urban	Rural: Dense	Rural: Village	Rural: Scattered	Rural: Farmland
6. Total Served (2+3+4+5)	8010	0	2017	0	0
7. Total (1+6)	8640	662	3389	216	1552

The details for the residential consumer units for urban areas are indicated in Table 14 of Appendix A. Barberton and Emjindini are served by a sewage purification works that was recently constructed and upgraded.

The details for the residential consumer units for rural dense areas are indicated in Table 15 of Appendix A.

The details for the residential consumer units for rural villages are indicated in Table 16 of Appendix A. No basic sanitation has been provided for these residents. Most of them use pit latrines that are below VIP standard. Hence provision must be made to upgrade the sanitation of these consumers.

The details for the residential consumer units for rural scattered areas are indicated in Table 17 of Appendix A. All the consumers in this category only have a very basic sanitation system i.e. pit latrine or septic tank. Thus provision is made in the long term to assist these consumers with sanitation.

The details for the residential consumer units for rural farm areas are indicated in Table 18 of Appendix A. All the consumers in this category only have a very basic sanitation system i.e. pit latrine or septic tank.

2.1.1.4 Grey Water Management

Grey Water is not dealt with at this stage within the dense informal settlements. These settlements have little to no access to water and the little grey water produced is used for garden / small crops irrigation.

When higher standard water is supplied eg yard tap or house connection, a grey water strategy will have to be implemented.

2.1.1.5 Pit emptying and sludge disposal

It will be necessary to implement a pit emptying and sludge disposal plan where VIP toilets are installed in dense settlements where access to land for the relocating of the VIP toilets are not available.

The municipality must plan and budget for sludge disposal services that will be necessary in future.

2.1.2 Future Trends and Goals (Residential Consumer Units)

2.1.2.1 Residential Consumer Units for Water & Sanitation: Level of service

It is the goal of the municipality to provide at least basic levels of services for all consumers within the municipal area in some point in time. It will not be possible to provide it in the next 5 years but should be implemented within the next 10 years.

2.1.2.2 Residential Consumer Units for Water

It is possible to provide all consumers in the urban areas with a metered house connection within the next 5 years. This includes the anticipated natural growth rate of the category.

Within the rural dense category it will be possible to provide all consumers with at least a basic level of service within the next 5 years and to upgrade a portion of the consumers to a higher level of service.

The rural village and rural scattered category can not be supplied with a basic level of service within the next 5 years. It is estimated that approximately 34% of the consumers will be upgraded to a basic level of service. This is due to the fact that in some cases the bulk water supply must be provided.

The municipality is currently not supplying any service in the rural farms category. It is however anticipated that some of the consumers (14%) will be provided with a basic level of service within the next 5 years.

Tables 9 to 13 in Annexure A provide the forecast of water services for the next 5 years.

2.1.2.3 Residential Consumer Units for Sanitation

The sanitation need for the urban category is very small and it is calculated that only 7% of the consumers does not have access to or has inadequate sanitation facilities. These consumers will be provided with a full level of service within the next year.

100% of all consumers in the rural dense category have inadequate of no access to sanitation services. It is anticipated that these consumers can be provided with at least a basic level of service in the next five years.

Currently 40% of the consumers in the rural village category do not have access to a basic level of service or have an inadequate level of service. It is anticipated that these consumers can be provided with at least a basic level of service in the next five years.

Currently 100% of the consumers in the rural scattered consumers do not have access to a basic level of service or have an inadequate level of service. It is anticipated that these consumers can be provided with at least a basic level of service in the next five years.

The municipality is currently not supplying any service in the rural farms category. It is however anticipated that some of the consumers (40%) will be provided with a basic level of service within the next 5 years.

2.1.2.4 Grey Water Management

Grey Water is not dealt with at this stage within the dense informal settlements. These settlements have little to no access to water and the little grey water produced is used for garden / small crops irrigation.

2.1.2.5 Pit emptying and sludge disposal

It will be necessary to implement a pit emptying and sludge disposal plan where VIP toilets are installed in dense settlements where access to land for the relocating of the VIP toilets are not available.

The municipality must plan and budget for sludge disposal services that will be necessary in future.

2.1.2.6 Types of sanitation technology options

The types of sanitation systems within the municipal area are:

- Discharge to a waste water treatment works;
- Consumer installations: On site dry or equivalent, including VIP toilets, USD, composting system;
- None or Inadequate: Below RDP: Pit latrine

2.1.2.7 2010 target for basic sanitation

The aim of the municipality is to provide all consumers with at least a minimum level of service eg VIP. It will however not be possible to provide the service by 2010 as there are currently approximately 31% of all consumers who do not have an adequate service.

2.1.3 Strategic Gap Analysis (Residential Consumer Units)

It was assumed in the calculation of the future trend in water and sanitation supply that the growth rate for the consumer units for will effectively be 2% per annum.

It is anticipated that the backlog in water services will be depleted with approximately 10% per annum. This amounts to the provision of basic water services to approximately 1618 consumers within the next 5 years.

It is anticipated that the backlog in sanitation services will be depleted with approximately 10% per annum. This amounts to the provision of basic sanitation services to approximately 3903 consumers within the next 5 years.

2.1.4 Implementation Strategies (Residential Consumer Units)

2.2 Public Institutions and “dry” industries

All public institutions in the urban area have been provided with water or have a water supply available.

The municipality of Umjindi provides water to both prisons in and adjacent to the town of Barberton. Water is also provided to a number of dry industries in the industrial area of the town.

Most of the public institutions in the rural area have been provided with water or have a water supply available. All 'dry' industries in the area provide their own water and are not depending on a municipal supply at present. The prison farm adjacent to Barberton is provided with potable water from the municipality.

The details of public institutions and 'dry' industries are indicated in Table 22 of Appendix A.

The resources available within the municipality to perform the function are:

	Yes	No	N/A	Comment
Is there budget?	X			
Are there by-laws?		X		
Is there infrastructure?	X			
Personnel available?	X			

It is the goal of the municipality to provide services to all future public institutions and dry industries that will develop in future.

2.3 Wet Industries

All 'wet' industries in the area provide their own water and are not depending on a municipal supply at present. The gold mines in the region provide their own water for the towns and hostels they manage.

The details of public institutions and 'dry' industries: rural is indicated in Table 23 of Appendix A.

The resources available within the municipality to perform the function are:

	Yes	No	N/A	Comment
Is there budget?		X		
Are there by-laws?		X		
Is there infrastructure?	X			Owned and operated by each industry
Personnel available?	X			

2.4 "Raw" Water Consumers

There is presently only one raw water consumer depending on the municipality for a water supply. The water demand and usage of this consumer is indicated in Table 24 of Appendix A.

However a number of sawmills, forestry villages, irrigation boards and gold mines use raw water in the region. They abstract water from the regional rivers, boreholes and the Shiyalongubu dam.

2.5 Industrial Consumer Units

No industrial consumer units for sanitation use sanitation services provided by the municipality.

2.6 Industries and their permitted effluent releases

The effluent releases for the gold mines have been requested and will be provided soon. All the gold mines in the bounds of the Umjindi Municipality have completed their EMPR studies and reports.

The details of the industries and their permitted effluent releases are indicated in Table 25 of Appendix A

3 WATER RESOURCE PROFILE

3.1 Water Source

The following water supply schemes are located in the Umjindi Municipality region:

a) The Barberton water supply scheme that provide potable water to Barberton, Emjindini and the Prison Farm from the Lomati dam and the Suid Kaap River;

b) The Sheba siding water supply scheme provides potable water to the Sheba Siding community from the Figtree Creek;

c) Low's Creek irrigation scheme that get water from the Shiyalongubu Dam and the Kaap River.

d) Water supply schemes for the Agnes, Fair View, Consort and Sheba gold mines.

e) River pumping installations of several farmers associated with the Noord Kaap, Suid Kaap, Queens River, Eureka and Low's Creek Irrigation Boards.

3.1.1 Situation Assessment (Water Source)

3.1.1.1 Surface Water Source

The Umjindi Municipality is blessed with several surface water sources.

The main water source for the Barberton and Emjindini towns is the Lomati dam that was constructed in the Lomati River. The Lomati River drains towards Swaziland. A water court permit has allocated 6,46 million m³ per annum to the municipality for potable use.

The Queens River flows into the Suid Kaap River below the town. A water court permit has allocated 2,5 million m³ per annum to the municipality for primary use. These allocations are sufficient to meet the existing demand for the usage of Barberton and Emjindini, but will have to be reviewed when the services for Emjindini Trust, Verulam and the extensions 11,12, 13 and 14 of Emjindini have been upgraded.

The Low's Creek Irrigation board obtain water from the Shiyalongubu dam and the Kaap River.

The Suid Kaap and Noord Kaap rivers join to form the Kaap River. The Queens River, Suid Kaap River, Noord Kaap River, Eureka and Low's Creek irrigation boards abstract water from these respective rivers for irrigation and primary use.

Some of the forestry villages use water from the mountain streams to provide water for domestic use. In some instances the water is treated and in other not.

The surface water resources are indicated in Table 27 of Annexure A.

3.1.1.2 Groundwater Sources

The ground water resources are indicated in Table 28 of Annexure A.

Only a few boreholes are used by the Lomshiyo Trust & Emjindini Trust for water supply purposes for domestic use.

Some of the forestry villages use boreholes to supply water for domestic purposes.

Several farmers obtain water from boreholes for domestic use. Detail records of these are not available at present.

Several of the mines use boreholes to supply water to the villages, hostels and offices. Sheba mine use fissure water from their level 19 shaft for potable water.

3.1.1.3 Groundwater Monitoring

The groundwater resources are not frequently monitored for quality. See Table 29 of Annexure A. No ground water quality problems have been experienced by consumers and the ground water in the municipal region is of a good quality.

3.1.1.4 External Sources (where the WSA purchase water form others)

At present the Umjindi Municipality does not purchase water from other sources.

A study has been done to determine if it would be feasible to construct a dam in the Concession creek, a tributary of the Queens River. This dam will be developed by the land owner and an agreement was made between the land owner and the Municipality for the supply of water to Barberton and Emjindini.

3.1.1.5 Water returned to resources

The water from the Barberton sewerage treatment plant is returned to the Suid Kaap River. A permit for 1,942 million m^3 per annum has been issued for the Barberton sewerage purification works. The capacity of this works has been increased in to provide for the development of sanitation in the extensions of Emjindini. The permit for the sewage works is also not balanced with regard the permits for the bulk water supply of Barberton and Emjindini. ***Allowance has only been made for 22% of the allowable abstraction to be returned.***

The gold mines in the area return water to the sources. The details of these returns are being awaited and will be included as soon as it becomes available.

3.1.2 Implementation Strategies (Water Source)

The water sources of the Municipality are currently managed well and provide enough water to supply the current consumers. Planning should be done to provide the consumers not currently supplied with water. This study should include water source planning and not only bulk supply to the consumers.

It is the vision of the Municipality to provide at least basic services to all the consumers in the municipal area.

3.2 Water Quality

3.2.1 Situation Assessment (Water Quality)

The table below indicates the Municipality's resources to proved water quality assessment functions.

	Resources available to perform function (Yes/No/NA)			
	Budgets	**Bylaws**	**Infrastructure**	**Personnel**
1. Quality of water taken from source: urban	Yes	No	Yes	Yes
2. Quality of water taken from source: rural	Yes	No	Yes	Yes
3. Reporting on quality of water taken from source: urban & rural	Yes	No	Yes	Yes
4. Quality of water returned to the sources: urban	Yes	No	Yes	Yes
5. Quality of water returned to the sources: rural	No	No	No	Yes
6. Pollution contingency measures	No	No	No	Yes

3.2.1.1 Quality of water taken from source: urban

See Table 31 of Annexure A. The quality of water for the urban sources is monitored and is acceptable in terms of SABS 241.

3.2.1.2 Quality of water taken from source: rural

See Table 32 of Annexure A. The quality of water for the rural sources is monitored and is acceptable in terms of SABS 241 most of the time.

3.2.1.3 Reporting on quality of water taken from source: urban and rural

See Table 33 of Annexure A. Urban and rural residents are notified by radio and word of mouth if the water quality is not according to the prescribed SABS standard.

3.2.1.4 Quality of water returned to the resource: urban

The quality of the water returned by the Barberton sewerage treatment plant is of the prescribed standard.

The quality of water in the monitoring boreholes of the waste disposal site for Barberton is done on an annual basis. The quality of the water is acceptable and no special measures are needed in this regard at present.

3.2.1.5 Quality of water returned to the resource: rural

The gold mines in the region return water to the sources. The details of these returns are being awaited and will be included as soon as it becomes available.

It is recommended that existing waste dumps be monitored as soon as possible.

3.2.1.6 Pollution contingency measures

The Umjindi Municipality should institute a regular programme of sampling and testing water available in the rivers at strategic locations for quality and fitness for human consumption.

3.3 Waterborne Sanitation

Barberton town and sections of Emjindini have water borne sanitation systems. The plan is to provide the service to the rest of Emjindini.

Other areas currently without water borne sanitation systems will be provided with the basic standard of sanitation.

The mine villages, hostels and offices and the forestry villages have access to water borne sanitation systems. Most of the sewage is treated by septic tank systems. Sewage from Fairview mine is treated at the Barberton Sewage Works.

4. WATER CONSERVATION / DEMAND MANAGEMENT (WC/WDM)

The model WC/WDM strategy for WSA's consists of a number of objectives and goals. Existing and proposed governance requirements to ensure the implementation of WC/WDM are also described. The model strategy is developed for a medium to large size WSA. Smaller WSA should strive to implement as many aspects of the strategy that are feasible.

The elements of the model strategy as described below will be used by the Umjindi Municipality to develop its own detailed strategy. Detailed strategies will identify appropriate action and business plans that will meet the stated objectives and goals.

Although this strategy is aimed primarily at the role of the water department at WSA, the activities of other departments such as the treasury and planning will also be affected.

Objectives and goals of a model WC/WDM strategy

The following objectives have been identified in the model strategy for this WSA:

Objective A: Implement efficient distribution management measures.

Objective B: Implement efficient water effluent management measures.

Objective C: Ensure adequate information to support decision making process.

Objective D: Promote the efficient use of water to consumers and customers.

Objective E: Adopt the ethos of partnerships and transparency.

Objective F: Adopt Integrated Resource Planning (IRP) principles.

Objective G: Ensure the implementation of WC/WDM best practises in new developments

Objective H: Contribute to the Catchment's Management Strategy

Objective A: Implement efficient distribution management measures

Al: Establish and maintain the integrity of water zones and districts for the entire water supply system.

A2: Monitor the level of UAW continuously for each district and zone.

A3: Reduce and maintain the level of UAW to acceptable standards and benchmarks using best management practices.

A4: Implement a consumer meter management programme.

A5: Implement a pressure management programme.

A6: Implement a pipeline maintenance and replacement programme.

A7: Implement efficient water effluent management systems.

A8: Install meters to all existing consumer connections.

SABS 0306 "the management of potable water in distribution systems" will be used as a reference guideline to achieve the above goals.

Some of the required actions to meet the above goals are as follows:

Al - Water zones and districts

- Install bulk district/zone meters and meter monthly the quantity of water provided to each determined supply zone within its supply area;

- Determine monthly the level of UAW by comparing the measured quantity of water provided to each determined supply zone with the total measured quantity of water provided to all user connections within that supply zone;

- Develop a system to monitor the minimum night flow of all districts and zone meters;

- Develop and implement a system to continuously prioritise zones with the highest level of UAW and to monitor any significant increase in the level of UAW.

A2,A3 - UAW

- Set target goals for reducing the level of UAW;

- Determine the various components of UAW (through demand analysis and appropriate field surveys);

- Develop and implement an ongoing leak detection and repair programme;

- Develop and maintain a service where the public can report a water leak 24 hours a day;

- Develop a policy to reduce and regulate illegal connection and illegal water use.

A4 - Meter management

- Develop monthly deviation reports of meters that illustrate a demand pattern which is consistent with a faulty meter;

- Develop reports annually that indicate if a meter is oversized or undersized;

- Check the accuracy of consumer meters that are suspected to be faulty or inaccurate;

- Ensure the compliance of all water meters to the Trade Metrology Act (Act 77 of 1973) as amended from time to time.

A5 - Pressure management

- Identify any areas with pressures higher than 900 kPa and any areas that have large fluctuations in pressures;
- Where required or feasible install pressure control valves in the supply system;
- Where required or feasible install pressure control valves at consumer connections to ensure pressures are below 600 kPa

Objective B: Implement efficient water effluent management measures

B1: Reduce and maintain the level of infiltration from storm water to acceptable benchmarks.

B2: Reduce and maintain the rate of effluent spillage and blockages.

B3: Increase efficiency in responding to reported leaks and bursts to below 12 hours.

B4: Develop and implement an effluent pipeline maintenance and refurbishment programme.

Objective C: Ensure adequate information to support decision making process

C1: Determine WDM goals.

C2: Produce a monthly a water audit and a water balance.

C3: Develop an information system to assist with customer care queries.

C4: Produce measurable target performance indicators.

C5: Produce monthly deviation reports of water consumption's.

C6: Establish and maintain a consumer database.

Objective D: Promote the efficient use of water to consumers and customers

D1: Develop an appropriate and ongoing marketing, communication and education programme.

D2: Implement water tariffs that promote social equity and promote efficient use of water.

D3: Ensure the payment of water services by all consumers.

D4: Develop and implement direct WDM measures identified to be viable through the IRP process (i.e. retrofitting of plumbing) .

D5: Reduce illegal connections.

D6: Assess the departmental water usage by WSA and establish, achieve and maintain appropriate demand targets.

D7: Prohibit the wasteful use of water by consumers and users.

Objective E: Adopt the ethos of partnerships and transparency

E1: Ensure the co-corporation and consultation amongst the various departments within a WSA that influence the operation and planning of water services.

E2: Identify and consult with consumer representative bodies on a regular basis.

E3: Participate in co-ordination meetings within Irrigation Boards, DWAF and CMAs (network and exchange information and knowledge).

E4: Publicise WC/WDM experiences in industry related media.

E5: Publish annually the authority's WC/WDM measures and performance.

E6: Publish a comprehensive breakdown of the cost of water services annually.

Objective F: Adopt Integrated Resource Planning: (lRP) principles

FI: Integrate water supply planning with planning of effluent services.

F2: Co-ordinate planning and WC/WDM measures with other water institutions in the water supply chain and in accordance with any regional WC/WDM and catchment's management strategies or requirements.

F3: Identify all possible WC/WDM measures and evaluate their feasibility.

F4: Determine the best combination of Supply-Side Management and Demand- Side Management options when required. (Ensure the prevention of premature development of expensive infrastructure such as reservoirs bulk pipelines, pump-station and wastewater treatment plants)

F5: Ensure the adequate allocation of funding and resources to WC/WDM measures.

F6: Empower, by informing, educating and capacitating officials.

F7: Develop a water demand scenario model and determine future demand goals. (Based on the IRP planning guidelines, appropriate demand analysis and regional demand objectives).

F8: Implement measures to monitor the impact of WC/WDM.

Objective G: Ensure the implementation of WC/WDM best practises in new developments

G1: Ensure the development and implementation of appropriate standards for new developments which promote efficiency (particularly with low cost housing to ensure sustainable services).

G2: Meter all new connections.

G3: Where feasible ensure the removal of invasive alien plants before development takes place.

G4: Implement incentive schemes for developers to adopt WC/WDM measures and standards.

G5: Ensure that every water services work or consumer installation comply with SABS 0252: Water Supply and drainage for buildings and SABS 0254: The installation of fixed electric storage water heating systems.

G6: Ensure that all plumbing fittings comply with SABS standards or the JASWIC list of accepted fittings.

Objective H: Contribute to the catchment's management strategy (water resource management strategy)

H1: Ensure the quality of treated effluent meets required standards.

H2: Minimise leaks of the effluent collection system.

H3: Maximise recycling and reuse of water where it is feasible.

H4: Promote the reduction of pollution by the authorities consumers.

4.1 Water Resource Management Interventions

4.1.1 Situation Assessment (Water Resource Management Interventions)

The main source of water supply to Barberton and Emjindini is the Lomati dam. The dam is surrounded by plantations and in some areas the trees are to close to the water level of the dam. It is recommended that an agreement must be reached between the Municipality and the forestry company to keep a buffer zone between the full water level and the nearest trees.

4.1.1.1 Targets for reducing unaccounted for water and water inefficiencies (MI/year: urban)

The targets for unaccounted water and water inefficiencies have been set. The present losses and inefficiencies are very low and within acceptable standards for the urban water supply. See Table 37 of Annexure A.

4.1.1.2 Targets for reducing unaccounted for water and water inefficiencies (MI/year: rural)

The targets for unaccounted water and water inefficiencies have been set. See Table 38 of Annexure A. The losses and inefficiencies will be kept within acceptable limits by the municipality.

4.1.1.3 Reducing high pressures for residential consumers: urban

The Umjindi Municipality is inspecting pipes frequently for leaks and water losses. Some of the areas in Barberton experience water shortages during pipe breaks. The water reticulation network in Barberton needs to be analysed and pressure zones need to be designed and implemented to equalise the pressures in the system.

4.1.1.4 Reducing high pressures for residential consumers: rural

The Umjindi Municipality is inspecting pipes frequently for leaks and water losses. No high pressure problems exist for rural consumers.

4.1.1.5 Consumer/end-use demand management: public information and education programmes

See Table 41 of Annexure A. The Umjindi Municipality provide education and information frequently to the public.

4.1.1.6 Leak and meter repair programmes: urban

The Umjindi Municipality plans to institute a meter repair and assistance program to consumers. Umjindi will institute a bulk meter programme to control leaks. Umjindi has budgeted for the purchase of leak detection equipment to implement the measurement and recording of night flows.

4.1.1.7 Leak and meter repair programmes: rural

The Umjindi Municipality plans to institute a meter repair and assistance program to consumers. Umjindi will institute a bulk meter programme to control leaks. Umjindi plans to invest in leak detection equipment to implement the measurement and recording of night flows.

4.1.1.8 Working for Water Programme

The Umjindi Municipality supports the working for water programme through education and media coverage.

5. WATER SERVICES INFRASTRUCTURE PROFILE

5.1 Water Services Infrastructure

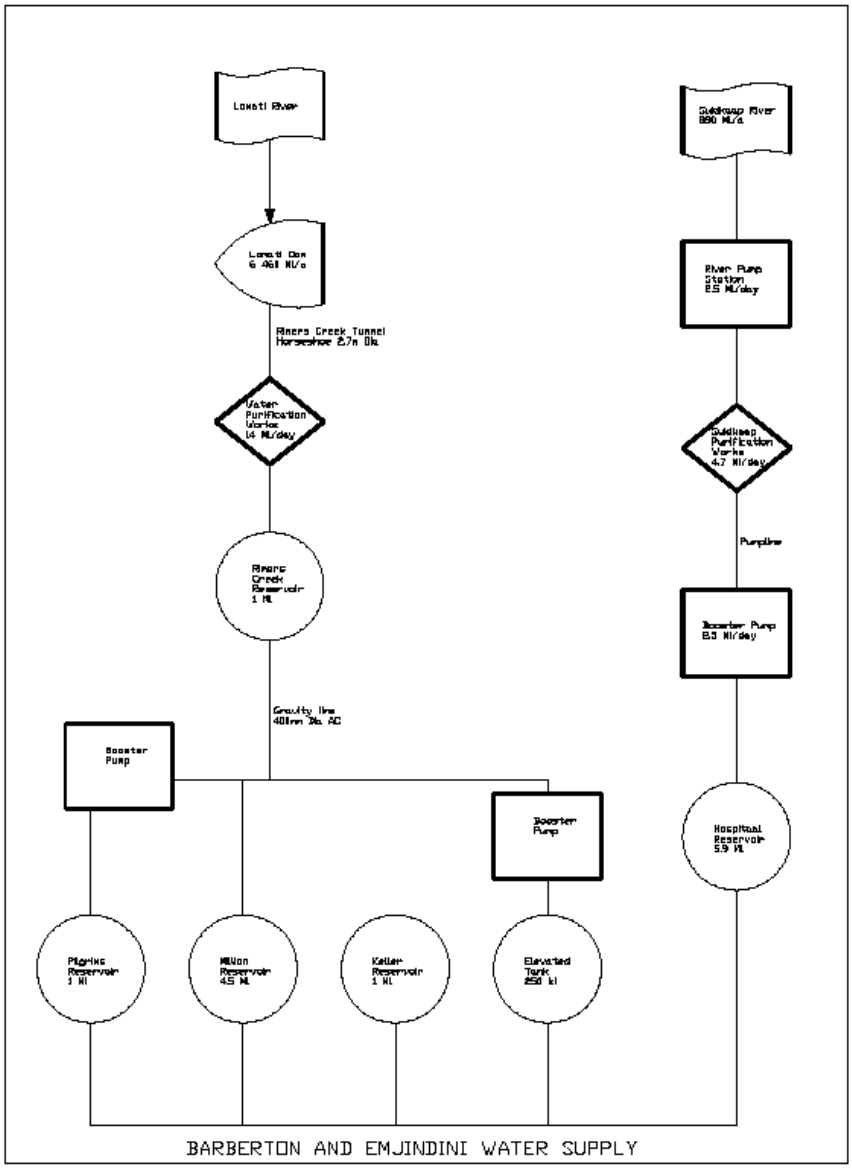
5.1.1 Situation Assessment (Water Services Infrastructure)

5.1.1.1 Existing infrastructure

The existing infrastructure is indicated in the drawings accompanying this report.

5.1.1.2 Brief functional description of existing main infrastructure components (urban and rural)

The existing main infrastructure available to the Umjindi Municipality for water supply to their consumers consists mainly of the elements indicated in the schematic diagram below:



The layout of the Lomati Dam water supply system is indicated in Appendix F. The system has sufficient capacity at present for the existing water demand. The future supply must be upgraded to meet the future demand.

A schematic layout is indicated in Appendix F for Emjindini Trust, KaMadakwa, Sheba siding, Fairview mine, Sheba mine and New Consort mine.

The rural villages do not have an organised or planned water supply at present.

5.1.1.3 Existing groundwater infrastructure

The existing groundwater infrastructure is indicated in Table 44 of Annexure A. No ground water infrastructure is used by the Umjindi Municipality. The existing ground water infrastructure used by private institutions and farmers are not known to the municipality.

5.1.1.4 Existing surface water infrastructure

The existing surface water infrastructure is indicated in Table 45 of Annexure A. The existing surface water infrastructure comprises the Lomati dam, Shiyalongubu dam and the natural rivers and springs in the municipal area. The Lomati dam has an effective storage capacity of 4,6 million m^3. The Shiyalongubu dam that is used for irrigation only has a capacity of 2,5 million m^3.

The rivers in the region are perennial and are used for irrigation. The Umjindi Municipality has a pump station on the Suidkaap River that is used to augment the Lomati water supply at present.

The yield of the Lomati dam can be improved by raising the dam wall. Due to future water requirements provision has been made in the IDP for this project in the next 5 to 10 years.

5.1.1.5 Existing water treatment works infrastructure

The Umjindi Municipality presently has two water purifications works. The water purification works at Rimer's Creek purifies water from the Lomati dam while the water purification works at Emjindini purifies water pumped from the Suid Kaap River.

The existing water treatment infrastructure is indicated in Table 46 of Annexure A.

The capacity of the Rimer's Creek water purification works is 14 Ml/day while the capacity of the Suid Kaap water purification works is 4,6 Ml/day.

Recently another water purification package plant was completed for the Sheba Siding community capable of purifying 0.2Ml/day.

5.1.1.6 Existing pump stations infrastructure

The pump station at the Suid Kaap River is used to abstract water from the river and pump the water to the Suid Kaap purification works situated at Emjindini. The pump station is not used on a regular basis. It is only used during periods when the demand cannot be met from the Rimer's Creek water purification works or when the water supply from the Lomati dam has to be augmented.

Two booster pump stations are used by the Umjindi Municipality to pump water to higher lying reservoirs.

The existing pump station infrastructure is indicated in Table 47 of Annexure A.

The replacement cost of the infrastructure is estimated to be approximately R845,000.00 with a required annual maintenance budget of R22,800.00 and required annual operating budget of R56,700.00.

5.1.1.7 Existing bulk pipeline infrastructure

The existing bulk pipeline infrastructure is indicated in Table 48 of Annexure A. The existing main bulk pipelines are:

- Pump main, 150mm Ø AC, from the Suidkaap River pump station to Suidkaap water purification works;
- Gravity main, 400 mm Ø AC, from the Rimer's Creek water purification works to the Million reservoir;
- Gravity main from Rimer's reservoir to Kellar reservoir; and
- Gravity main, 300 mm Ø AC, from the Million reservoir to the Hospital reservoir.

The total length of bulk pipelines for the Barberton water supply scheme is some 45 km of piping with diameters ranging from 75mm to 400mm. The replacement cost for these pipes is estimated to be R6,325,000.00 with an annual maintenance cost of R379,000.00

5.1.1.8 Existing reservoir infrastructure

The existing bulk pipeline infrastructure is indicated in Table 49 of Annexure A.

The total storage capacity of the Barberton water scheme is 16 Ml. The reservoir storage capacity is not sufficient in comparison with the other elements. The reservoir storage capacity should be increased to approximately 20 Ml. Additional storage of 10 MI is required to balance the present water demand with the storage capacity. To provide the required storage it is necessary to construct a 4Ml reservoir for Barberton.

The replacement cost of the infrastructure is estimated to be approximately R31,050,000.00 with a required annual maintenance budget of R232,000.00.

5.1.1.9 Existing reticulation infrastructure (by supply zone)

The Barberton water supply scheme is served with a water reticulation network that is sufficient to provide a basic service level. i.e. standpipes with a maximum walking distance of 200m to all the residents in Barberton and Emjindini. The water reticulation network for Barberton provides individual metered connections to the residents of Barberton. Approximately 70% of the residents in Emjindini have individual metered connections. The water reticulation networks are indicated in Appendix E. The water

reticulation systems will have to be upgraded if a higher level of service is to be provided by the WSA for the balance of Emjindini. A large quantity of AC pipelines is installed in Barberton town, these pipes are continuously bursting leading to large amounts of water losses. The pipes must be replaced by uPVC pipelines.

Several residential villages referred to as Emjindini Trust, Sheba Siding and Lomshiyo Trust does not have water reticulation systems at present. Hence basic water supply systems have to be provided for these communities.

5.1.1.10 Existing sanitation infrastructure

Barberton town and some extensions of Emjindini are served by a full water borne sanitation system. The remainder of Emjindini has access to pit latrines and VIP's. The settlements of Verulam, Emjindini Trust, Sheba siding and Lomshiyo Trust is served by pit latrines.

5.1.1.11 Existing sewage treatment works infrastructure

The capacity of the sewage purification works at Barberton is currently 5.8Ml/day. The capacity of the works is currently being upgraded to accommodate the expanding service area in Barberton and Emjindini as well as the future bulk water supply. The future capacity of the work will be 8Ml/day.

5.1.1.12 Schemes to be transferred: water

All the water schemes that provide water to the consumers of the municipality are the property of the municipality.

Hence no schemes need to be transferred from DWAF or the Ehlanzeni District Municipality

5.1.1.13 Schemes to be transferred: sanitation

All the sanitation schemes that provide sanitation services to the consumers of the municipality are the property of the municipality.

Hence no schemes need to be transferred from DWAF or the Ehlanzeni District Municipality.

5.1.1.14 Schemes to be rehabilitated

Some sections of the water network of Barberton are passed their design life of 30 years and require refurbishment. The water network also has to be analysed to provide more balanced pressure zones and equal distribution of water.

5.1.1 Future Trends and Goals (Water Services Infrastructure)

5.1.2.1 New Infrastructure to be built

The new bulk and link infrastructure to be built is indicated in Appendix G. Table 51 of Appendix A provides as list with estimated costs for the proposed new bulk and link infrastructure.

The master planning for these infrastructure units have not been completed and it is suggested that the infrastructure be developed according to the order in Table 51.

5.1.2.2 Future internal and connector infrastructure

The future internal and connector infrastructure is indicated in Table 52 of Appendix A. The future connector infrastructure is indicated in Appendix G with the bulk infrastructure.

It is further proposed that on site sanitation be provided for the short to medium in this area. Either a ventilated pit latrine or a flush toilet coupled to a septic tank should be installed for each site that has not been provided with water borne sewage system.

5.1.2.3 Future bulk water supply infrastructure

Provision has to be made for the bulk and link water supply of the areas to be upgraded from squatter status to formal residential status. These include Emjindini Extension 11 and 13. Bulk water and sewer also has to be supplied to Emjindini Extension 12. Emjindini can be supplied from the present Barberton water supply system, but the provision will have to be made for additional bulk water supply systems to provide water to the residents of Emjindini Trust, Lomshiyo Trust, Sheba siding and Shiyalongubu.

The future bulk supply infrastructure components are indicated in Table 53 of Appendix A.

5.1.2.4 Future bulk sanitation infrastructure

Package sewage purification plants may have to be provided for future urban development at Sheba Siding, Emjindini Trust and Lomshiyo Trust. It is however envisaged that these areas will be provided with VIP toilets on site for the short to medium term.

6 WATER BALANCE

6.1 Water Balance

6.1.1 Situation Assessment (Water Balance)

6.1.1.1 Amount of bulk water abstracted (Ml/year)

The amount of bulk water that is abstracted by the Umjindi Municipality for primary use is indicated in Table 54 of Appendix A.

Water is also abstracted by irrigation boards, gold mines and other users from the rivers in the municipal region. The irrigated areas are indicated in the table below:

Irrigation Board	Area (Ha)	Estimated Abstraction (million m³ / annum)
Suidkaap River	2314	23.14
Noordkaap River	932	9.32
Queens River	1636	16.36
Eureka	750	7.50
Low's Creek	1527	15.27
Total	7159	71.59

The Umjindi Municipality is virtually bounded by tertiary catchments X23 and X14 in terms of the "Surface Water Resources of South Africa 1990". The total irrigation area given in the latter publication for tertiary catchment X23 is 72,6 km² and catchment X14 is 11,4 km² which correlates with the table above. The total net MAR for tertiary catchment X23 is 206 million m³. The total net MAR for quaternary catchments X14A and X14B (Lomati and Shiyalongubu dams) is 111,7 million m³. Hence it can be concluded that in terms of the hydrology of the municipal region sufficient water is available, provided that enough storage for drought periods is created.

6.1.1.2 Amount of bulk water purchased from others (Ml/year)

No bulk water is presently purchased from others for the water schemes in the Umjindi Municipality region.

6.1.1.3 Water supplied to consumers (Ml/year) – urban

The water supplied to urban consumers is indicated in Table 55 of Appendix A.

6.1.1.3.1 Categorisation of residential uncontrolled volume supply (Ml/year)

6.1.1.4 Water supplied to consumers (Ml/year) – rural

The water supplied to rural consumers is indicated in Table 56 of Appendix A.

6.1.1.5 Total physical water losses (Ml/year)

The total physical water losses per annum are indicated in Table 57 of Appendix A

6.1.1.6 Total influent received at treatment works

The influent received at the treatment works of the Barberton purification works is indicated in Table 58 of Appendix A.

7 WATER SERVICES INSTITUTIONAL ARRANGEMENTS PROFILE

7.1 Water Services Institutional Arrangements

7.1.1 Situation Assessment (Water Services Institutional Arrangements)

7.1.1.1 WSA functions and outputs

The Umjindi Municipality has the ability to be a Water Services Authority in terms of the Water Services Act.

At present the Umjindi Municipality is responsible for the functions and outputs of a WSA in the municipal area. Table 60 of Appendix A indicates the WSA functions and outputs.

7.1.1.2 WSA capacity development

The Umjindi Municipality has developed its capacity significantly over the past years to be able to perform the functions of a WSA. However capacity development related specifically to the WSA functions and outputs are required. These are indicated in Table 61 of Appendix A.

7.1.1.3 Bylaws affecting water services

The Model Bylaws suggested for adoption by the Umjindi Municipality is given in Appendix I.

7.1.1.4 Water services providers (retail water) – current year

Currently no water service providers have been contracted or employed by the Umjindi Municipality.

7.1.1.5 Water services providers (sanitation) – current year

Currently no sanitation service providers have been contracted or employed by the Umjindi Municipality.

7.1.1.6 Water services providers (bulk water) – current

The Umjindi Municipality acts as the WSP for bulk water in the municipal region.

7.1.1.7 Water services provider (bulk sanitation) – current

The Umjindi Municipality acts as the WSP for bulk sanitation in the municipal region.

7.1.1.8 Support services agents (water) – current

The Umjindi Municipality employs private contractors to assist with the maintenance and operation of some of the services in the area. Private firms are engaged with the provision of repair services on pumps and equipment used for water supply in the area.

The Umjindi Municipality further utilises the services provided by Engineering Consultants with regard to planning, design and documentation and construction supervision of development projects.

7.1.1.9 Sanitation promotion agent – current

No sanitation promotion agent has been appointed as yet. The PIMSS centre with the district municipality however plays an important role with regard to the awareness relating to the improvement of sanitation facilities.

7.1.1.10 Support service contracts – current

The current support service contracts are indicated in Table 62 of Annexure A. No current support service contracts are used by the Umjindi Municipality.

7.1.1.11 Water service institution

The Umjindi Municipality will not need the assistance of another WSA or a Water Board to assist with the WSA functions.

7.1.1.12 WSP staffing levels: water

The WSP staffing levels for water are indicated in Table 63 of Annexure A.

7.1.1.13 WSP staffing levels: sanitation

The WSP staffing levels for sanitation are indicated in Table 64 of Annexure A.

7.1.1.14 WSP training programme

The WSP training programmes are indicated in Table 65 of Annexure A.

7.1.2 Future Trends and Goals (Water Services Institutional Arrangements)

7.1.2.1 Water Services providers (retail water) – year 5

It is envisaged that the Umjindi Municipality will continue to act as the Water Service Provider (WSP) in the medium to long-term future.

It is further envisaged that all settlements will have a WSP serving them within the next five years.

It is further anticipated that contracts will be in place with any WSP's who will be providing water services within the next 5 years.

7.1.2.2 Water Services providers (sanitation) – year 5

It is envisaged that the Umjindi Municipality will continue to act as the Water Service Provider (WSP) (sanitation) in the medium to long term future.

It is further envisaged that all settlements will have a WSP serving them within the next five years.

It is further anticipated that contracts will be in place with any WSP's who will be providing water services within the next 5 years.

7.1.2.3 Water services provider (bulk water) – year 5

It is envisaged that the Umjindi Municipality will continue to act as the WSP for bulk water in the area for the short to medium term. It is however envisaged that private partnerships may be involved with the provision of bulk sanitation in the region.

7.1.2.4 Water services provider (bulk sanitation) – year 5

It is envisaged that the Umjindi Municipality will continue to act as the WSP for bulk sanitation in the area for the short to medium term. It is however envisaged that private partnerships may be involved with the provision of bulk sanitation in areas to be developed close to private institutions.

7.1.2.5 Support services agents (water) – year 5

It is envisaged that the Umjindi Municipality could employ private contractors to assist with the maintenance and operation of some of the services in the area.

The Ehlanzeni District Municipality will further continue to utilise the services provided by Engineering Consultants with regard to planning, design and documentation and construction supervision of development projects

7.1.2.6 Sanitation promotion agent – year 5

It is anticipated that the sanitation awareness and development will be handled in-house by the Umjindi Municipality.

8. CUSTOMER SERVICES PROFILE

8.1 Customer Services

8.1.1 Situation Assessment (Customer Services)

The table below provides the resources to provide customer service functions.

	Resources available to perform function (Yes/No/NA)			
	Budget	**Bylaws**	**Infrastructure**	**Personnel**
1. Quality of service for water: urban	Yes	No	Yes	Yes
2. Quality of service for water: rural	No	No	Yes	Yes
3. Attending to complaints for water: urban	Yes	No	Yes	Yes
4. Attending to complaints for water: rural	No	No	Yes	Yes
5. Attending to complaints for sanitation: urban	Yes	No	Yes	Yes
6. Attending to complaints for sanitation: rural	No	No	Yes	Yes
7. Education for basic water services	No	No	Yes	Yes
8. Pollution awareness	No	No	Yes	Yes

8.1.1.1 Quality of service for water: urban

The quality of service for urban water supply is indicated in Table 66 of Annexure A.

The quality of the service is good and immediate attention is given to the maintenance and repair of the water supply system when breakages occur.

8.1.1.2 Quality of service for water: rural

The quality of service for rural water supply is indicated in Table 67 of Annexure A.

8.1.1.3 Attending to complaints for water: urban

The attendance to complaints for urban consumers is indicated in Table 68 of Appendix A. No specific records have been kept in the past and the implementation of a monitoring system to record complaints should be instituted by the municipality.

8.1.1.4 Attending to complaints for water: rural

The attendance to complaints for rural consumers is indicated in Table 69 of Appendix A. No specific records have been kept in the past and the implementation of a monitoring system to record complaints should be instituted by the municipality.

8.1.1.5 Attending to complaints for sanitation: urban

The attendance of complaints for urban sanitation is indicated in Table 70 of Annexure A. No specific records have been kept in the past and the implementation of a monitoring system to record complaints should be instituted by the municipality.

8.1.1.6 Attending to complaints for sanitation: rural

No sanitation service is presently provided. It is envisaged to promote on-site sanitation that will enable consumers to provide their own operation and maintenance for the next five years.

8.1.1.7 Education for basic water services

The Umjindi Municipality promote awareness with regard to the payment of services at a higher level than the basic free water level. The payment of services is paramount in the Umjindi Municipality.

The community is familiar with the personnel that are locally responsible for maintenance and complaints are reported to the local offices of the Umjindi Municipality.

Table 71 of Appendix A indicates the targets with regard to education for basic and free water services.

8.1.1.8 Pollution awareness

The community will be educated with regard to pollution. The community education programme will motivate residents to prevent pollution and assist with the clean-up of rivers and streams

The awareness of pollution is also promoted with charity organisations in the municipal area.

8.1.2 Implementation Strategies (Customer Services)

It is recommended that:

- A recording system is implemented to record the quality of service and complaints with regard to water and sanitation in the municipal region.
- Education programmes in the community be continued and improved
- A programme or action be instituted to improve the pollution awareness of the community.

9. FINANCIAL PROFILE

9.1 Capital Funds

9.1.1 Situation Assessment (Capital Funds)

9.1.1.1 Capital expenditure: water

The capital expenditure for water is indicated in Table 72 of Appendix A.

9.1.1.2 Capital expenditure: sanitation

The capital expenditure for sanitation is indicated in Table 73 of Appendix A.

9.1.1.3 Sources of capital income: water

The sources of capital income for water are indicated in Table 74 of Appendix A.

9.1.1.4 Sources of capital income: sanitation

The sources of capital income for sanitation are indicated in Table 75 of Appendix A.

9.2 Operating Costs and Income

9.2.1 Situation Assessment (Operating costs and income)

9.2.1.1 Operating costs: water

The operating cost for water is indicated in Table 76 of Appendix A.

9.2.1.2 Operating costs: sanitation

The operating cost for sanitation is indicated in Table 77 of Appendix A.

9.2.1.3 Operating income: subsidies

The operating income from subsidies is indicated in Table 78 of Appendix A

9.2.1.4 Operating income: tariffs

The Umjindi Municipality has a fully-fledged accounting system. It is in operation at the municipality. Accounts are rendered monthly for water consumption and sanitation services. The total income and expenditure for water is indicated in Table 79 of Appendix A. The total income and expenditure for sanitation is indicated in Table 80 of Appendix A.

9.3 Tariff and Charges: Residential

9.3.1 Situation Assessment (Tariff and Charges)

9.3.1.1 Fixed charges: residential (per month) for water

Fixed charges have been implemented for residents with individual connections. The fixed charge is R24.93 for developed residential sites in Barberton and R22.55 in Emjindini. The tariff for businesses and undeveloped sites is R45.86 per month.

9.3.1.2 Fixed charges: residential (per month) for sanitation

Fixed chargers have been implemented for residents with individual water borne sewage connections. The tariff for private residential is R3.95 per 100m² or portion of the site area with a maximum of R77.33 per month.

9.3.1.3 Volume charges or other charge mechanisms: residential sanitation

No volume charges have been implemented for residential sanitation.

9.3.1.4 Block tariffs: residential (cents/kl) for water

The block tariff for purified water to all consumers is R3.49 per kl.

9.4 Free Basic Water and Sanitation

9.4.1 Situation Assessment (Free Basic Water and Sanitation)

9.4.1.1 Subsidy targeting approach for free basic water

The municipality apply a free basic water allocation of 6 kl/month for each consumer. Each consumer is credited with the free basic water allocation on his account.

9.5 Charges and Block Tariffs: Industrial & Commercial

9.5.1 Situation Assessment (Charges and Block Tariffs)

9.5.1.1 Fixed charges and block tariffs: industrial for water

The fixed tariff for businesses and undeveloped sites is R45.86 per month and R3.49 per kl of consumption.

9.5.1.2 Fixed charges and block tariffs: industrial for wastewater

The tariff for commercial and industrial sewerage is R3.95 per 100m² or portion of the site area with a maximum of R1,800.00 per month.

9.5.1.3 Fixed charges and block tariffs: commercial for water

The fixed tariff for businesses and undeveloped sites is R45.86 per month and R3.49 per kl of consumption.

9.5.1.4 Fixed charges and block tariffs: commercial for wastewater

The tariff for commercial and industrial sewerage is R3.95 per 100m² or portion of the site area with a maximum of R1,800.00 per month.

9.5.1.5 Fixed charges and block tariffs: other for water

Not applicable for Umjindi Municipality.

9.5.1.6 Fixed charges and block tariffs: other for sanitation

Not applicable for Umjindi Municipality.

9.6 Income and Sales

9.6.1 Situation Assessment (Income and Sales)

9.6.1.1 Total income (and non-payment) and expenditure: water

The total income and expenditure for water is indicated in Table 79 of Appendix A.

9.6.1.2 Total income (and non-payment) and expenditure: sanitation

The total income and expenditure for water is indicated in Table 80 of Appendix A.

9.6.1.3 Sales arrangements

The Umjindi Municipality has a fully-fledged accounting system. It is in operation at the municipality. Accounts are rendered monthly for water consumption and sanitation services. Bills are delivered by hand and by post. Payments are collected at several offices in the municipal area. Strict credit control is being applied to ensure a low non-payment rate for services.

9.7 Metering and Billing

9.7.1 Situation Assessment (Metering and Billing)

9.7.1.1 Metering and Billing: urban

Metering and billing have been implemented for urban areas. Meters are read on monthly basis. Consumers are billed monthly in relation to their consumption for all consumers with individual metered connections.

9.7.1.2 Metering and Billing: rural dense

Metering and billing have been implemented for dense rural areas. Meters are read on monthly basis. Consumers are billed monthly in relation to their consumption for all consumers with individual metered connections.

9.7.1.3 Metering and Billing: rural villages

Metering and billing have not been implemented for rural village areas as these are presently served by communal stand pipes, boreholes or water tankers.

9.7.1.4 Metering and Billing: rural scattered

Metering and billing have not been implemented for rural scattered areas as these are presently served by available natural sources and privately owned boreholes.

9.7.1.5 Metering and Billing: rural farmland

Metering and billing have not been implemented for rural farmland areas as these are presently served by available natural sources and privately owned boreholes.

10. LIST OF PROJECTS

10.1 Projects

10.1.1 Situation Assessment (Projects)

10.1.1.1 Annual water and sanitation project list

The proposed list of capital projects are indicated in the table below.

Description	Capacity / Quantity	Estimated Cost
Sewerage Reticulation System: Emjindini Ext. 11	535	R 1,600,000
VIP Toilets for Rural and Urban Settlements	3900	R 18,720,000
3 Ml Reservoir Barberton Ext 7	3Ml	R 4,200,000
1Ml Reservoir to replace Pilgrim reservoir	1Ml	R 1,400,000
Water Reticulation Infrastructure Emjindini Extension 11		R 1,300,000
Replace AC pipelines in Barberton with uPVC		R 5,000,000
Water Reticulation Infrastructure Emjindini Extension 13		R 2,000,000
Upgrading of Suid Kaap Water Purification Works		R 5,000,000
Reticulation infrastructure Sheba Settlement - Phase 2		R 1,000,000
Bulk water and reticulation infrastructure Emjindini Trust		R 2,500,000
Reticulation infrastructure Verulam Settlement		R 1,200,000
Construction of Concession Creek Dam		R 30,000,000
Construction of Concession Creek Bulk Supply Main		R 5,000,000
Mechanical & electrical upgrades for Barberton sewage works		R 5,000,000
Sewer jet cleaner (pipeline cleaner)		R 250,000
Incinerator at sewage works		R 700,000
Chlorination plant for Kamadakwa		R 100,000
Water provision for farm labourer		R 1,500,000
Water truck		R 550,000
Total		**R 87,020,000**

10.1.1.2 WSA sustainability project list

Description	Capacity	Estimated Cost
VIP toilets for rural and urban settlements	3900	R 18,720,000
Upgrading of Suid Kaap water purification works		R 5,000,000
Total		**R 23,720,000**

Appendix A: Tables

Appendix B: Base map of Umjindi Municipality

Appendix C: Built-up areas of Umjindi Municipality

Appendix D: Existing bulk and link services

Appendix E: Existing reticulation services

Appendix F: Schematic presentation of existing bulk infrastructure

Appendix G: Map of future situation

Appendix H: Landuse map of the Umjindi Municipality

Appendix I: Model Bylaws