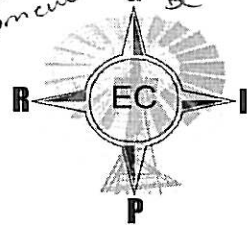


# GROUNDWATER RESOURCE INFORMATION PROJECT EASTERN CAPE PROVINCE

## GROUNDWATER INFORMATION SOURCE REFERENCE SHEET

*Water Services  
Development Plan  
&*



**SOURCE  
REF NR:**

SR 196

Own Archive		Copy attached	✓
Sourced	✓	Copy at source	

**A: SOURCE DESCRIPTION**

District Municipality:	Amatole	Chris Han	O.R Tambo	
	Ukhahlamba	Cacadu	Alfred Nzo	✓
Local Municipality:	<b>NDLAMBE</b>			
Institution where Information is held:	<b>UWP CONSULTING</b>			
Branch of Institution:	<b>EAST LONDON</b>			
Contact details:	Contact person: <b>WS KETTERINGHAM</b>			
	Contact Tel: <b>043-7430186</b>			
	Contact Email: <b>wayne.k@uwp.co.za</b>			

**B: TYPE OF INFORMATION**

Information format:	Hard copy	✓	Data Summary		Electronic Report	
	Specify Other:					
Report / Info Title:	<b>NDLAMBE MUNICIPALITY WATER SERVICES DEVELOPMENT PLAN, VOL1 OF 2: MAIN DOCUMENT, JULY 2003</b>					
Report Nr:	<b>24525 NDLAMBE WSP</b>	Date:	<b>JULY 2003</b>			
Author Details:	<b>WS KETTERINGHAM</b>					
Author's Qualification:	Hydrogeologist		Govt Dept		Project Manager	
	Engineer	✓	Technician		Other	
	Specify Other:					
Captured by: PS. Nel	Date:	<b>12/03/2004</b>	Signed:			

**C: GEOHYDROLOGICAL CATEGORIZATION**

Project Type	Source development		Feasibility Study		Sanitation Study:	
	Specify Other: <b>WSDP</b>					
Reference Co-ordinate:	Latitude	Longitude				
Lithological & Construction Logs	Yes	No	Complete	Incomplete		
Hydrocensus Data		✓				
Pump Testing Data		✓				
Chemical Water Analysis Data	✓		✓			
Geohydrological Data	✓			✓		
Spring Data		✓				
Remote Sensing Data		✓				
Map Data	✓		✓			
Comments:						

Reviewed by: **JU du Plooy**      Date: **14/03/2004**      Signed:

Your ref.  
Our ref. 24526/01  
Enquiries WS Ketteringham  
E-mail wayne.k@uwp.co.za

P O Box 11170, Southernwood, East London, 5213  
22 Belgrave Road, Belgravia, East London, 5201

Telephone (+27) (043) 743-0186  
Telefax (+27) (043) 743-0288  
E Mail eastlondon@uwp.co.za  
Website www.uwpweb.co.za

Date 14 August 2003

Cacadu District Municipality  
P O Box 318  
PORT ELIZABETH  
6000

**ATTENTION : MR P SNYMAN**

Dear Sir

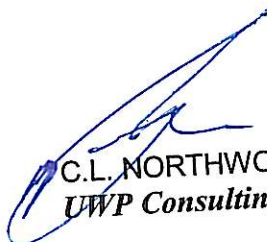
**RE: NDLAMBE WATER SERVICES DEVELOPMENT PLAN**

Your discussion with our Mr Ketteringham on 13 August 2003 has reference.

Enclosed herewith please find a copy of the WSDP for your records.

Please note that the DWAF Preparation Guideline Document was not used in the compilation of the WSDP due to uncertainty regarding its relevance. However should you require that the information be transferred to this format, we would be able to do it within the remaining budget. (budget was R150 000; total invoiced to date R115 138.38)

Yours faithfully



C.L. NORTHWOOD  
UWP Consulting

UWP CONSULTING (PTY) LTD Reg. No 1995/009872/07

Registered with the South African Association of Consulting Engineers

Directors: DLAMINI BE, DLULANE ML, DOUDENSKI HV, LÖTTER JBZ (Managing); MORROW PI; NORTHWOOD CL; SILBERNAGL DH\*; SLABBERT GFB; STEWART RD; WHITE MH

\* Austria

Associates: CROESER ME, GARDINER MI; ISAAC RL; KETTERINGHAM WS; MAKER LC; McINTYRE P; MUNNIK S; SKEA AD; VAN HEERDEN H; VAN WYK SJ

Financial Manager: MARSBERG VA

Offices: Bryanston Durban Cape Town Centurion East London Empangeni Eshowe Pietermaritzburg Polokwane Potchefstroom Steelpoort Ulundi Umlata



**NDLAMBE MUNICIPALITY  
(EC 105)**

**WATER SERVICES DEVELOPMENT PLAN**

**VOLUME 1 OF 2**

**MAIN DOCUMENT**

**JULY 2003**

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## LIST OF ACRONYMS

<b>WSDP</b>	-----Water Services Development Plan
<b>IDP</b>	-----Integrated Development Plan
<b>WSA</b>	-----Water Services Authority
<b>WSP</b>	-----Water Services Provider
<b>CMA</b>	-----Catchment Management Agency
<b>NLM</b>	-----Ndlambe Local Municipality
<b>CDM</b>	-----Cacadu District Municipality
<b>DWAF</b>	-----Department of Water Affairs and Forestry
<b>ACWB</b>	-----Albany Coast Water Board
<b>TLC</b>	-----Transitional Local Council
<b>TRC</b>	-----Transitional Representative Council
<b>DORA</b>	-----Division of Revenue Act
<b>DFA</b>	-----Development Facilitation Act
<b>EIA</b>	-----Environmental Impact Assessment
<b>SDI</b>	-----Spatial Development Initiative
<b>PIMSS</b>	-----Planning and Implementation Support Services
<b>MAP</b>	-----Mean Annual Precipitation
<b>MAE</b>	-----Mean Annual Evaporation
<b>MAR</b>	-----Mean Annual Run-off
<b>WTW</b>	-----Water Treatment Works
<b>WWTW</b>	-----Waste Water Treatment Works
<b>VIP</b>	-----Ventilated Improved Pit Latrine
<b>WBS</b>	-----Waterborne Sanitation

## LIST OF ACRONYMS continued

<b>CMIP</b>	-----Consolidated Municipal Infrastructure Programme
<b>DHLG</b>	-----Department of Housing, Local Government and Traditional Affairs
<b>CAPEX</b>	-----Capital Works Expenditure
<b>OPEX</b>	-----Operational Works Expenditure
<b>MSL</b>	-----Mean Sea Level
<b>MAAP</b>	-----Multi-Annual Action Plan

## ACKNOWLEDGEMENTS

This Water Services Development Plan reflects the collective efforts of a number of organisations and persons who contributed time, skill and energy towards its outcome. Their contributions are acknowledged and are recorded as follows: -

- 1 Ndlambe Municipality Councillors
- 2 Ndlambe Municipality Officials
- 3 Cacadu Municipality Officials
- 4 Albany Coast Water Board Officials
- 5 UWP Consulting (WSDP Consultants)
- 6 Setplan (IDP Review Consultants)

## EXECUTIVE SUMMARY

### *INTRODUCTION*

The Ndlambe Municipality is one of the Category B municipalities within the Cacadu District Municipal area of the Eastern Cape Province and was afforded Water Services Authority (WSA) status by the Minister of the Department of Provincial and Local Government (DPLG) during January 2003. This authorisation came into effect on 1 July 2003 and as a result, the Ndlambe Municipality is now required by legislation to prepare a Water Services Development Plan (WSDP), indicating how it will provide effective, efficient, affordable and sustainable water services to its constituents.

A study of the existing situation reveals that there are several major priority areas needing attention, including the following:

- There are an estimated **9 500** people (12.6%) **needing access to a RDP level of water service;**
- There are an estimated **2 400** people (3.2%) **needing access to a RDP level sanitation service;**
- The backlogs are to a large extent located within the former townships or on private land in the rural areas;
- The area has limited access to reliable raw water resources, both in terms of yield and quality;
- Much of the bulk water and wastewater infrastructure is at capacity and/or is in a poor state of repair;
- There are limited financial and human resources available to the Municipality;
- There are certain institutional and organisational inefficiencies which prevent the Municipality from effectively undertaking its responsibilities.

### *NDLAMBE IN PERSPECTIVE*

The Ndlambe Municipality, which accommodates some 80 000 people residing in 5 main urban centres, 5 coastal resorts and 21 rural settlements, is primarily an agricultural area, but also has a strong tourism base due to its coastline, rivers, nature reserves and cultural heritage sites. The inland areas are the primary agricultural areas whilst the coastal areas are the primary tourism areas.

The town of Port Alfred, which is located on the coast, is the administrative centre of the Municipality whilst the regional route R72, which links Port Alfred with Port Elizabeth to the west and East London to the east, is the main transport route through the Municipality. The regional route R67, linking Port Alfred with Grahamstown, is the next most important transport route through the Municipality.

As a result of the tourism potential of the area, the area sees a high influx of people, particularly during the main holiday periods. This has a major impact on the area in terms of services provision, in that infrastructure needs to be sized to accommodate these short duration influxes.

It is reported that some 15 % of the total population reside in former townships or informal settlements and that some 25 % of the population resides in a rural environment. It is furthermore reported that:

- 51 % of the population fall within the dependent range i.e. 0-18 years or 65+;
- 34 % of the population are unemployed;
- 61 % of households have an income of below R 1 500 per month;
- The average monthly household income is in the order of R 1 530.

The above indicates that large portions of the population may not be able to pay for even basic levels of service, without some form of subsidisation.

### ***EXISTING INFRASTRUCTURE***

There are six (6) local water supply schemes that service the main settlements within the region. Two (2) of the schemes are fed from surface water resources whilst the balance are fed from groundwater resources or a combination of groundwater and de-salinated sea water. The reliability and/or quality of the raw water resources are generally poor, and have a major inhibiting impact on development in the area.

There are four (4) wastewater treatment works in the area. A large percentage of the households (+/- 75%) are however serviced with conservancy tanks, septic tanks or VIP's.

In many instances the capacity of both the water and the wastewater bulk supply infrastructure is inadequate to cater for the seasonal peak demands and the new housing developments. Furthermore, some of the infrastructure is said to be in a poor state of repair.

### ***PROPOSED PROGRAMMES AND PROJECTS***

Several programmes have been identified to address water services needs of the Municipality. These programmes include the following:

- A **Water Management Programme** to address both the water losses and to augment the limited raw water supply;
- A **Basic Services Backlogs Programme** focused at providing access to a basic level of service to those areas, which currently do not have access to the prescribed minimum level of service.

- A **Maintenance, Refurbishment and Upgrading Programme** focusing at restoring the efficient economic operation and capacity of existing bulk and reticulation infrastructure and to upgrade the infrastructure to support new development; and
- An **Institutional Programme**, which aims to address the support mechanisms required to ensure the efficient and effective implementation of the above programmes, both in terms of the Water Services Authority and the Water Services Provider functions of the Municipality.

### ***FINANCIAL IMPLICATIONS***

It is estimated that the Municipality will require some **R 10 million** to address its basic needs backlogs and some **R 100 million** meet its higher level development needs. This cost excludes the resource development costs which have been estimated to be in the order of **R 300 million**. At present the Municipality is only guaranteed some **R 2 million** per year to address these needs.

The impact on the revenue budget of addressing the basic needs is not that significant, but it is estimated that an additional **R 7.5 million** per year would be required to service the higher level development needs of the Municipality.

### ***INSTITUTIONAL PLAN***

The Municipality is required to investigate its long-term provider arrangements as required in terms of the Municipal Systems Act and it is required to develop its WSA capacity. It is understood that this will be undertaken through a separate initiative under the direction of the Cacadu Municipality.

## 1 INTRODUCTION

Water is one of the most critical natural resources required to sustain human life, health and socio economic development. Furthermore, the demand for water services cuts across many sectors, such as agriculture, fisheries, industry, urban and rural development, energy and public health. In terms of the Constitution of South Africa, every person has a right of access to basic water services (water and sanitation) and a healthy and safe environment. The above does however need to be taken in the context that water is a scarce resource within South Africa.

It is therefore of utmost importance that water services be effectively managed and regulated to ensure a sustainable balance between the competing demands for water and the available water resources.

Presently water services planning, implementation, provision and regulation takes place within various sectors and government departments, from a national to a local level, with limited co-ordination. This raises the need for a holistic and integrated planning approach to water services provision. Furthermore, Government has adopted a more decentralised approach to service delivery. Therefore, in order to achieve these objectives, Government has legislated that all Local Authorities undertake an Integrated Development Planning (IDP) process (multi-sectoral plan) and that Water Services Authorities (WSA) undertake a Water Services Development Planning (WSDP) process.

This report is the product of a Water Services Development Planning process, which ran partly in parallel with and served to inform, and feed from, the IDP review process of the **Ndlambe Municipality**. In turn, this report will also serve to inform the required WSDP process and thereby the IDP process of the **Cacadu Municipality**.

Consultation in the development of this WSDP has taken place through the following channels:

- Telephonic discussions and interviews with certain stakeholders;
- Interviews with certain municipal officials;
- A workshop with key municipal officials and councillors.

## 2 LEGISLATIVE CONTEXT

### 2.1 LEGISLATION

The following legislation provides the framework for water services provision: -

- The Constitution of South Africa (108 of 1996)
- The National Water Act (36 of 1998);
- The Water Services Act (108 of 1997).

The following local government legislation impacts on water services provision: -

- The Municipal Structures Act (117 of 1998);
- The Municipal Systems Act (32 of 2000);
- The Municipal Structures Amendment Act (33 of 2000);
- The Division of Revenue Act (enacted annually).

The following legislation focuses on development planning in general.

- The Development Facilitation Act (67 of 1995);
- The Physical Planning Act (25 of 1991);
- The Environmental Conservation Act (73 of 1989);
- The Land Use Bill (2002).

### 2.2 WATER SERVICES FOCUS

The **National Water Act** serves to protect the nation's water resources by legislating the use, development, conservation, protection, management and control of the water resources (both surface and groundwater). This Act therefore defines how a municipality may obtain use of the water required for distribution to its consumers and how the municipality may return the effluent and other wastewater back to the water resource.

The **Water Services Act** addresses the right of access to basic water services by legislating the municipal functions of providing water services and clarifies the roles of the following main institutions: -

<i>Institution</i>	<i>Primary function</i>
• Water Services Authority (WSA)	: Regulating and ensuring access to water services.
• Water Services Provider (WSP)	: Provision (operation and maintenance) of water services to consumers under contract to the WSA.
• Water Boards (WB)	: Provision (operation and maintenance) of bulk water services to other institutions.

The following regulations have emanated from the Water Services Act and need to be considered in preparing the WSDP. They are: -

<i>Relevant Section of the Act</i>	<i>Title</i>
• 9(1) and 73(1)(j)	• Regulations relating to compulsory national standards and measures to conserve water.
• 19(5)	• Regulations on matters which must be regulated by a contract between a water services authority and a water services provider and compulsory provisions to be included in such a contract.
• 10(1)	• Norms and standards in respect of tariffs for water services in terms of section 10(1) of the Water Services Act.

### 2.3 LOCAL GOVERNMENT FOCUS

The **Municipal Structures Act** addresses the basis for establishing municipalities (Category A, B and C) and determines the powers and functions of the respective municipality types.

This Act stipulated that the local municipality (Category B) was the WSA, but the wording of the Act was later amended in the **Municipal Structures Amendment Act** to state that: -

- Category A (Metropolitan) Municipalities and Category C (District) Municipalities are WSA's.
- Category B (Local) Municipalities can be a WSA, if authorised by the Minister of Provincial and Local Government.

Therefore, in terms of the **Municipal Structures Amendment Act**, the Cacadu Municipality, which is a Category C municipality, is a WSA for the Cacadu Municipal area. However, the Ndlambe Municipality, which is a Category B municipality, was authorised WSA status by the Minister of DPLG during January 2003. This authorisation came into effect on 1 July 2003.

The **Municipal Systems Act** legislates the internal systems (IDP, performance management, procurement procedures and credit and debt collection, etc.) and accountability of the Municipality and addresses: -

- Performance management to ensure efficient and effective administration and use of municipal resources,
- The differences between the authority and the provider functions,
- Alternative mechanisms for providing municipal services.

The **Division of Revenue Act** (DORA) provides for an equitable share of the nationally raised revenue between the various spheres of government. This division takes place in the form of:

-

- Equitable share allocations : Meant to cover the operational costs of (S-Grant portion) providing basic services.
- Infrastructural grants : These grants are grants "in kind" as opposed to "conditional" grants (DORA 2000). This implies that the Municipality implements the project, and that ownership of the infrastructure commences as from the date of implementation of the project.

## 2.4 DEVELOPMENT PLANNING FOCUS

The **Development Facilitation Act** (DFA) is of great relevance to all planning processes, especially spatial planning processes, because it has introduced a normative (or principle-based) approach to planning. Chapter I of the Act provides general principles for land development and conflict resolution. These principles provide a framework for integrated development planning and establish certain minimum norms and conditions, which promote the integration of different aspects of development. The optimisation of existing resources such as bulk infrastructure, roads, transportation and social facilities is also addressed.

The **Physical Planning Act** seeks to promote orderly physical development.

The **Land Use Bill** provides a consolidated approach to normative planning and spatial development management. It is intended that the DFA will be replaced by the Land Use Bill and that ultimately, all Town Planning Schemes will be replaced by Land Use Schemes, which will integrate environmental management plans with spatial development plans (generated by the IDP's).

The **Environmental Conservation Act** controls the usage of land. The Act refers to "sensitive environments" as well as "listed activities" which might have a substantial environmental impact. Environmental Impact Assessments (EIA's) are required for all developments that fall into one or both of the specified activities, before one can proceed with the development.

## 2.5 **WATER SERVICES DEVELOPMENT PLANS**

In terms of Section 12(1) of the Water Services Act, a Water Services Authority (WSA) is required to prepare a Water Services Development Plan (WSDP), as part of the integrated development plan (IDP) process. In the WSDP, the WSA must detail how it will ensure its constituents access to water services, whilst taking the following into account: -

- Basic human needs;
- Equitable access to water services;
- Efficient and sustainable use of water services;
- Social and economic development;
- A growing demand for water;
- Conservation of the water resource;
- The need to reduce and prevent the pollution and degradation of the water resource.

The phases, which constitute the WSDP process, are the following: -

- Phase 1            Situation Assessment
- Phase 2            Strategic & Tactical Planning
- Phase 3            Action Planning
- Phase 4            Compilation
- Phase 5            Adoption

## 2.6 LINKAGES BETWEEN WSDP's AND IDP's

In terms of the **Municipal Systems Act**, every municipality must adopt a single inclusive and strategic plan for the development of the municipality. Therefore, every municipality must integrate and co-ordinate different sector plans into a single strategic planning tool.

However, the **Water Services Act** states that the WSDP should be part of the Municipality's IDP process, and should inform the IDP regarding specific requirements in terms of water and sanitation. In the same way, the IDP of the municipality must inform the WSDP of the municipality's key issues and objectives derived from the IDP process, as they relate to water and sanitation specific issues.

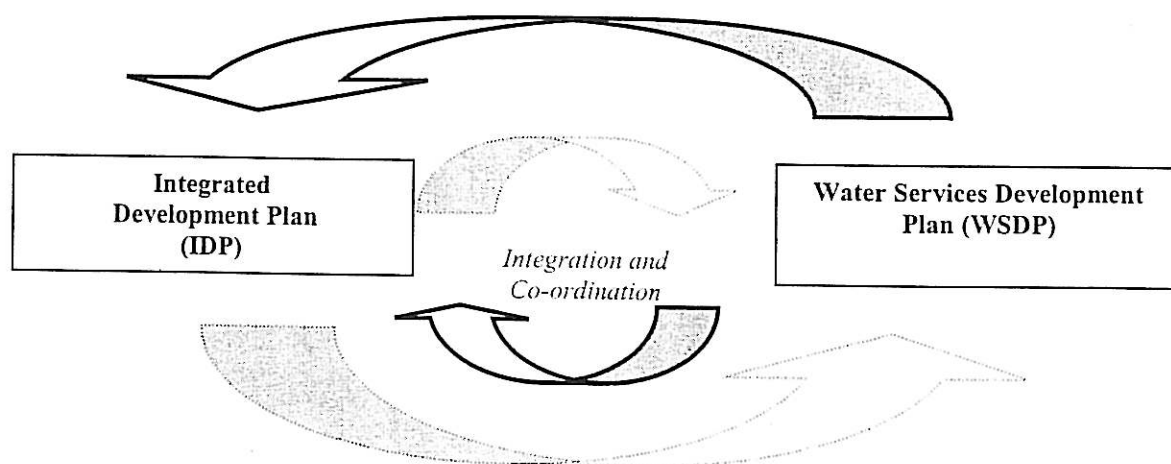


Figure 1: Linkages between the WSDP and IDP Processes

This WSDP must therefore be read in conjunction with the IDP's of both the Cacadu and Ndlambe Municipality's.

## 2.7 INTEGRATION BETWEEN DISTRICT AND LOCAL MUNICIPALITY PLANNING

As a Category C municipality, the **Cacadu Municipality** provides the **framework** for all integrated development planning of the Local Municipalities within its area of jurisdiction, to ensure alignment in local and district planning, adherence to local and provincial policy and to ensure proper consultation in the planning processes. However, the Local Municipality's integrated development planning processes, in-turn serves to inform the Cacadu Municipality's IDP and WSDP processes.

### 3 DEVELOPMENT PLANNING CONTEXT

#### 3.1 POLICY CONTEXT

There are various policy plans at a Provincial, District and Local levels, which provide the context for the WSDP. These policy documents are summarised below.

#### 3.2 PROVINCIAL POLICY PLANS

##### 3.2.1 The Provincial Spatial Development Plan

The PSDP, which provides the framework for future development in the Eastern Cape Province, recognises Port Elizabeth and East London as major growth nodes in the Province. Of relevance to the Ndlambe Municipality, the PSDP also identifies Grahamstown and Port Alfred as development nodes and in addition, it proposes that the growth corridor linking Grahamstown to Port Alfred be strengthened to develop agricultural and tourism opportunities. Furthermore Port Alfred is seen to have an important service role for tourism development initiatives along the Sunshine Coast and the inland mountain regions.

This policy document also outlined a strategic investment policy approach, which is intended to guide decision-makers as to where to spend money and on what. The approach is depicted graphically below where the width of the triangle represents the focus and extent of the investment.

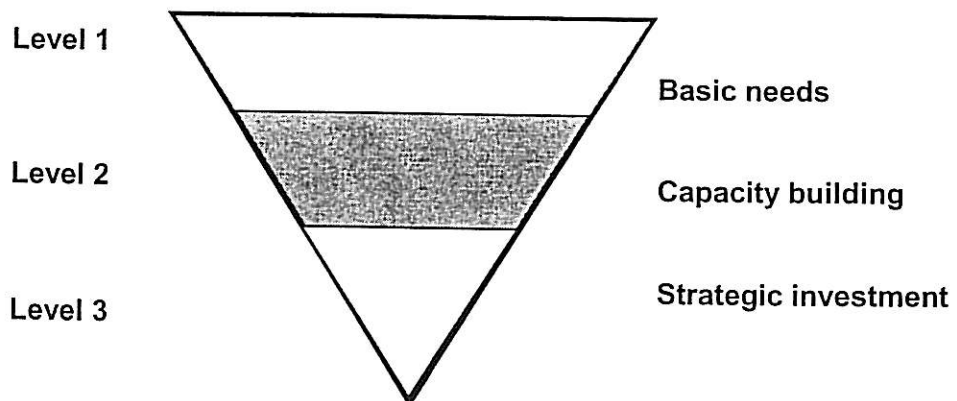


Figure 2: Strategic Investment Policy Approach

### **3.3 REGIONAL POLICY PLAN**

#### **3.3.1 Cacadu Municipality IDP**

The Cacadu Municipality completed its IDP in 2002 and identified the following development themes:

- Extending basic infrastructure;
- Increasing economic growth through access to economic opportunity with an increased focus on agriculture;
- Responding to the social needs of communities with emphasis on health and HIV/AIDS;
- Developing environmental strategies to enhance sustainable development;
- Transforming the municipal institution to meet the developmental challenges of local government.

In terms of the Ndlambe perspective, the spatial development framework identifies the Grahamstown, Bathurst and Port Alfred link as a development zone, focusing on the tourism and agricultural potential of the area. The plan furthermore identifies the N2 from Port Elizabeth via Grahamstown to King Williams Town and the R72 from Port Elizabeth via Port Alfred to East London as the main tourism routes for the region.

#### **3.3.2 Western District Council: WSDP**

The Cacadu Municipality has yet to complete its WSDP and therefore the Western District Council WSDP is the latest planning document pertaining to water services. This document does however only focus on the former TRC areas i.e. excludes the former TLC areas altogether.

### **3.4 LOCAL POLICY PLANS**

#### **3.4.1 Ndlambe Municipality IDP**

The Ndlambe municipality completed its IDP during 2002 and has recently undertaken its 2003 review. The spatial development framework identifies Port Alfred and Alexandria as the main development nodes with the main coastal resorts and Bathurst as secondary development nodes.

The IDP, which also highlights the need for environmental conservation, identifies the **provision of adequate water services as its primary development need.**

### **3.5 SUMMARY**

The various documents in general identify the R72 (coastal route) and the R67 (inland route) as the main development corridors through the Ndlambe Municipality. The main towns on these routes are identified as development nodes, with Port Alfred being the primary development node for the region.

#### **4 COMMUNITY NEEDS / ASPIRATIONS**

No detailed community needs assessment was undertaken as part of this study, however, a series of community meetings were held as part of the recent IDP processes, during which access to adequate water supply services was identified as the primary development need.

## 5 CURRENT SITUATION

### 5.1 MUNICIPAL SETTING

#### 5.1.1 Provincial and Regional Perspective

The Ndlambe Local Municipality (NLM), which houses some 80 000 people, is located within the Cacadu District Municipality's area of jurisdiction in the Eastern Cape Province. The Municipality is bounded by the Indian Ocean to the south, the Amatole District Municipality to the west, the Makana Local Municipality to the north and the Sundays River Valley Local Municipality to the East. Refer to **Map 1** for the location of the Ndlambe Municipality.

The town of Port Alfred, which is located on the coast, is the administrative centre of the NLM. The regional route R72, which links Port Alfred with Port Elizabeth to the west and with East London to the east, is the main transport route through the NLM, whilst the regional route R67 linking Port Alfred with Grahamstown, is the next most important transport route within the NLM area.

#### 5.1.2 Regional Development Overview

The Local Government Elections of 5 December 2000 heralded a newly demarcated municipal area by combining TLC and TRC jurisdictions under the new municipal order. The NLM emanated from the following: -

- |                        |     |
|------------------------|-----|
| • Port Alfred          | TLC |
| • Alexandria           | TLC |
| • Bushmans River Mouth | TLC |
| • Kenton-on-Sea        | TLC |
| • Bathurst             | TLC |
| • Cannon Rocks /Boknes | LC  |
| • Seafield             | LC  |
| • Albany               | TRC |
| • Alexandria           | TRC |

The Municipality, which is some 1642 km<sup>2</sup> in extent, is now managed through nine (9) wards, whose locations are indicated in **Map 2**.

The municipal area, which has an overall population density of 37 per km<sup>2</sup>, is primarily an agricultural area with a strong tourism base due to its coastline, rivers, nature reserves and cultural heritage sites. The primary settlements occur along the coast line with the agricultural areas being located further inland from the coast. The densities within the settlements vary from between 5000 – 7000 per km<sup>2</sup> for the former townships to 200 – 300 per km<sup>2</sup> for the towns and less than 100 per km<sup>2</sup> for the smaller coastal resorts and rural settlements. See **Maps 3 and 4** respectively for the population and settlement type distributions throughout the NLM.

Apart from Port Alfred, which is both the administrative and commercial centre of the NLM, the coastal settlements are primarily residential areas (holiday, retirement and “dormitory” suburb areas) and are currently experiencing substantial growth. Alexandria and Bathurst are primarily agricultural support centres, with cattle dairy, pineapples and chicory being the primary agricultural activities in the area. There are no major industrial complexes within the area.

See **Map 5** for the current land uses within the NLM.

### 5.1.3 Topography

The municipal area extends from sea level along the coastal belt, increasing in a northerly (inland) direction to elevations of between 500m and 600m above MSL in the vicinity of Grahamstown and the Kap River mountain range

The region is characterised by a number of incised river valleys, which generally run in a south easterly direction through the NLM to the coast, and which break the municipal area at regular intervals.

**Map 6** depicts the topography of the region.

### 5.1.4 Climate and Vegetation

The climate is generally moderate throughout the year with a mean annual temperature of approximately 20<sup>o</sup>C. Maximum temperatures are experienced in January and minimum

temperatures in July. Although the region does receive rainfall all year round, it is primarily a summer rainfall region.

The eastern portion of the regional is generally covered by tropical bush and savannah, whilst the western generally covered by coast at tropical forest with stretches of tropical bush and savannah along the river courses.

### 5.1.5 Demographics

Ndlambe houses some 80 000 people, whose distribution is indicated on **Maps 3 and 4**. It must however be noted that the coastal resorts see a major influx of people, particularly during the summer holiday periods.

The populations within the main settlements are indicated in **Table 1** below.

**Table 1: Population Distribution**

Area	Population (2000)	Additional Seasonal Population
Port Alfred	36 997 (20 466)	15 000
Alexandria	9 189 (5 225)	
Bushmans River Mouth	4 500 (6 964)	3 000
Kenton-on-Sea	5 000 (7 737)	12 500
Bathurst	6 188 (10 640)	
Seafield / Kleinemonde	200 (1 477)	
Common Rocks / Boknes	372 (3 873)	2 500
Rural Areas	16 643 (18 454)	
<b>TOTAL</b>	<b>79 089 (74 836)</b>	<b>33 000</b>

(Ref: Ndlambe IDP 2002)

**Notes:**

- The figures in brackets are those obtained from the DWAF National Database.
- The PIMSS database indicates a permanent population of some 45 000.
- The figures obtained from the various consultants technical reports, are generally higher than those in both the DWAF and PIMSS databases.
- From the above it can be seen that approximately 25% of the population reside in a rural setting.
- Although not indicated in the table, some 15% of the population reside in informal settlements areas on the outskirts of the main towns.

According to the DWAF and PIMSS databases, the demographic data for the NLM area is as follows:

• Gender	:	Male	=	46.8 %
		Female	=	53.2 %
• Age distribution:	:	0 – 18 years	=	33.7 %
		19 - 64 years	=	48.6 %
		65 years+	=	17.7 %
• Growth rates	:	1996 – 2001	=	1.01 %
		2002+	=	1.02 %

See **Annexure A** for the PIMSS database data and **Annexure B** for the DWAF National database data.

### 5.1.6 Socio Economic Profile

The DWAF and PIMSS databases reveal the following socio-economic data:

• Monthly household income distribution	:	0 – 1500	=	61.1 %
		1501 –6000	=	16.7 %
		6000+	=	22.2 %
• Dependency levels	:	(0-16; 65+ years)	=	51.4 %
• Unemployed	:		=	33.5 %
• Education level	:	None	=	18.9 %
		Primary	=	37.1 %
		Secondary	=	26.5 %
		Tertiary	=	3.2 %

See **Annexures A and B** of this document respectively for the relevant PIMSS and DWAF database data.

### 5.1.7 Water Services Overviews

#### *Water*

There are a six (6) local water supply schemes which service the main settlements within the area. Port Alfred, Seafiel / Kleinemonde and parts of Bathurst are all fed from surface water schemes, whilst the balance of the area is fed from groundwater schemes. Bushmans River Mouth and Kenton-on-Sea augment their groundwater supplies with desalinated water,

especially during the peak summer holiday season. The rural areas, private coastal resorts and parts of Bathurst are generally serviced through private supply systems (rain water tanks and boreholes).

The details of the respective water schemes in the area are contained in **Annexure C** of this document.

**The reliability of the yields and the quality of the water from the respective water sources is in general inadequate. Furthermore, the capacity of the bulk infrastructure of many of the schemes is in general inadequate, especially to meet the peak season demands. This results in many of households in the area augmenting their municipal supplies by rainwater harvesting i.e. rainwater tanks. This was in fact a prerequisite for development stipulated by the former Western District Council.**

The entire population do have access to a formal water service, although some to a level of service below RDP standards. It must however be noted that in terms of both assurance of supply and quality, the bulk of the area receives a level of service below the RDP standards. The water service needs of the NLM are represented graphically in **Map 7**, whilst the access to the varying levels of water supply service is as tabulated below.

**Table 2 : Access to Water Supply Services**

<b>Level of service</b>	<b>% of Total population</b>
Yard connections	62.4
Communal standpipes	24.9
Sub RDP / none	12.6

**Notes:**

- It can be noted that the bulk of the settlements with a sub-RDP level of service are located on privately owned farmlands, in Bathurst or in informal settlements.

**Sanitation**

The bulk of Alexandria and portions of Port Alfred, Bushmans River Mouth and Kenton-on-Sea (primarily the former townships of the latter areas) all have reticulated sewer systems, whilst the balance and of the coastal resorts all have conservancy or septic tanks. The rural settlements general, tend to have pit latrines of sub-RDP standard.

The sanitation needs are indicated graphically on **Map 8**, whilst the access to the varying levels of sanitation services is as tabulated below.

Table 3: Access to Sanitation Services

Level of service	% of total population
Sewered	21.9
Conservancy/ septic tanks	41.8
VIP's	33.1
Sub RDP / none	3.2

**Notes:**

- It can be noted that the bulk of the settlements with sub-RDP levels of service are located on privately owned farmlands.

The details of the respective sanitation systems within the area are contained in **Annexure C** of this document.

### 5.1.8 Economic Characteristics

The IDP reveals that agriculture, tourism and service industries form the basis of the economy of the region. Unemployment is currently at 33.5% of the population.

### 5.1.9 Affordability

It has been widely reported that people are generally prepared to spend between 1% and 5% of their disposable income on payment for services. It has however also been reported that levels of service and context play a major role in this regard. People may be unwilling to pay for what is perceived to be a low level of service but may be prepared to pay up to 10 % of their disposable income in areas where alternative services are not available.

Based on the average monthly household income of approximately R1550, it can be stated that in general, households within the NLM may be willing to pay in the order of R15 to R77 per month on all services. However, according to the Amatole District Municipality's level of service framework, the monthly costs for the suite of basic services, is roughly as follows: -

- Water R12
- Sanitation (VIP) R 6
- Electricity R55
- Solid Waste R 7
- **Total R80**

As approximately 61% of households have an income of less than R1500 it can be seen that the bulk of the population will probably not be able to afford to pay for even basic levels of service without some form of subsidy.

## 5.2 RAW WATER RESOURCES

### 5.2.1 Surface Water

**General:**

The NLM is located partly within the "Q" drainage region (Fish River Catchments) and partly within the "P" drainage region (Albany Coast Catchments) of South Africa, as defined in the Water Research Commission Report No.298 of 1994. The primary drainage regions in the area are indicated on **Map 9** and are tabulated below: -

**Table 4: Primary Drainage Regions and Associated Rivers**

<i>Drainage Region</i>	<i>Primary River</i>
Q93	Great Fish
P40	Kowie
P30	Kariega
P10	Bushmans
P20	Boknes

The mean annual precipitation (MAP) for the region is in the vicinity of the South African average of 502mm and varies from approximately 400 to 600mm, decreasing in northerly (inland direction). See **Map 10** for the MAP distribution for the region.

The mean annual evaporation (S - pan) varies from between 1400mm and 1500mm in the eastern portion of the area increasing in a north westerly direction to between 1500mm and 1600mm. See **Map 11** for the MAE distribution for the region.

The mean annual run-off (MAR) varies from between 0mm and 100mm for the entire region, indicating a fairly water scarce region. See **Map 11** for the MAR distribution for the region.

The soils are generally moderate to deep clayey loams with an undulating relief at the coast, becoming steep as one moves inland. The erodability index of the soils in the region is low with the exception of those in the Great Fish River catchments, which are medium to high.

**Rivers:**

The main rivers within the NLM area and their respective main tributaries are as tabulated below:

**Table 5: Main Rivers and Tributaries**

River	Tributary
Great Fish	Kap
Kowie	Bloukrans
Kariega	Tanga
East Kleiniemonde	
West Kleiniemonde	
Kasunga	
Bushmans	iCamatarha
Boknes	

**Water Quality:**

The main phenomenon affecting the quality of the water in region is the materialization or salinization of the waters in the main catchments due to the geology (marine origin) of the area.

**Water Supply Schemes / Impoundments:**

The details of the main water impoundments within the NLM are as tabulated below:

**Table 6 : Main Water Impoundments within the NLM**

DAM/WEIR	RIVER	OWNER/ OPERATOR	STORAGE CAPACITY $10^6\text{m}^3$	1:50 YEAR YIELD $10^6\text{m}^3/\text{a}$	AREA SERVED
Sam Meyer Dam	Bathurst stream	NLM	2.5	1.6	Port Alfred
Mansfield Dam	?	NLM	0.2	Incl. above	Bathurst / Port Alfred
Wellington Dam	?	Private	?	?	Seafield /Kleinemonde
Golden Ridge	?	Private	?	?	Bathurst

Other water supply scheme of importance to the NLM is the Lower Fish Government Water Scheme. The Lower Fish River Government Water Scheme, which is part of the Orange River Development Project, provides water for Grahamstown and for irrigation along the bank of the Lower Fish River. Water for these areas is diverted from the Great Fish River at the Hermansus Kraal Weir and through a tunnel to the Glen Melville Dam. Water for irrigation is then conveyed by river and canal to the Glen Boyd Balancing Dam and then on to irrigators by pipelines.

Some 300 ha of the scheduled 364 ha is currently under irrigation, whilst  $11 \times 10^6$  m<sup>3</sup>/a of the  $14 \times 10^6$  m<sup>3</sup>/a allocation is currently being used.

The possibility exists to extend this scheme to service a substantial portion of the Ndlambe region.

### 5.2.2 Groundwater

The geology of the area generally comprises of shale, quartzite, sandstones and diamictite of the Cape super group with inserts of calcereous sandstone and limestone of the Nanagu formation (younger in age). See **Maps 13a and 13b** for the geology for the area.

The groundwater potential in the region is therefore generally poor, resulting in low borehole yields (generally below 2 l/s) and high salinity waters. The eastern and western portions of the region are in fact classified by DWAF as "poor groundwater areas", whilst the balance of the region is defined as "minor groundwater areas". See **Map 14** for the distribution of existing boreholes and the groundwater potential of the area.

Groundwater in the region therefore appears only to be suitable for interim domestic supplies or for small standalone schemes in the central areas of the NLM. Coastal aquifers are however currently being extensively used at present.

## 5.3 WATER BALANCE

A water balance needs to be scheme or drainage region specific in order to have meaning, as catchments areas and schemes are not confined to geographical or political boundaries. This detailed analysis is beyond the scope of this study, however the results of the Fish to Tsitsikamma Water Management Area; Water Resources Situation Assessment (August 2002) reveals the following:-

- **Lower Fish Sub-Catchment** (Q9 part)

The Lower Fish sub-catchment (Q91 A,B and Q93 A to D) has a positive yield balance at, 1995 levels and a 1:50 year assurance of supply, of some  $69.9 \times 10^6 \text{ m}^3/\text{a}$  (includes imports of some  $110.8 \times 10^6 \text{ m}^3/\text{a}$ ). Furthermore, the report indicates some scope for development of this sub-catchment. The estimated cost to increase the yield by some  $21.8 \times 10^6 \text{ m}^3/\text{a}$ , at year 2000 price levels, was estimated at R 332 million including VAT.

- **Albany Coast Catchment** (P)

This catchment has a positive balance yield of some  $1.9 \times 10^9 \text{ m}^3/\text{a}$ . The report also indicates some potential to develop this sub-catchment, to increase the yield by some  $35.9 \times 10^6 \text{ m}^3/\text{a}$ . The cost of this development, at year 2000 price levels, was estimated at R651 million.

It can furthermore be noted that the Eastern Cape Water Resources Situation Assessment (June 1999) indicates a potential to develop a regional water scheme to meet the future needs of Port Alfred, Bathurst, Kenton-on-Sea, Bushmans River Mouth and Alexandria. This scheme, which would require that Grahamstown increase its water use from the Orange River via the Glen Melville Dam, would be based on the conjunctive use of groundwater and surface water via the Settlers and Sarel Hayward Dams.

## 5.4 CURRENT PROJECTS

See **Map 17** for the locations of ongoing and proposed projects.

### 5.4.1 Water

There are three (3) projects which are currently being implemented within the NLM, namely:-

- Refurbishment of the Water Treatment Works and bulk infrastructure at Port Alfred; R 2.0 million (CMIP).
- Augmentation of supply to Cannon Rocks/Boknes R 1.7-2.0 million (Cacadu DM)
- Upgrading of Bulk Infrastructure for the Albany Coast Water Board ; R 3.2 million (CMIP)

### 5.4.2 Sanitation

There are no bulk sanitation projects currently being implemented, although internal services are being provided/upgraded in certain areas. These include:

- Upgrading the sanitation services in Nemato to a waterborne system; R ? million (Housing Board).
- Progressive the upgrading of the sanitation services in Port Alfred; ongoing (NLM).

### 5.4.3 Housing

There are a number of ongoing and proposed housing developments, funded via the National Housing Board, within the NLM area. They are:-

- Thornhill - Port Alfred    2000
- Nemato -Port Alfred    1057
- Bathurst                    400
- Kenton                      235
- Bushmans                  235
- Kipfontein                220
- Station Hill                113
- Alexandria                714

Each of these housing developments include for the provision of internal services. However, the impact of these developments on existing bulk water services infrastructure is significant. Funding for the internal services is funded via the National Housing Board, whilst the bulk or connector services are generally funded with CMIP funding. Funding constraints often prevent the co-ordinated implementation of the respective projects. i.e. the required upgrading of the bulk infrastructure generally lags the implementation of the housing development.

## 5.5 INSTITUTIONAL ARRANGEMENTS

### 5.5.1 General

Since the local government elections of December 2000, the respective institutions have by-and-large tended to focus on their own affairs, primarily due to staff shortages, and partly as the powers and functions of the respective institutions not being finalised. The transitional nature of the institutional arrangements seriously impacted on the ability of the respective institutions to provide effective service delivery. However, the powers and functions have since

been announced and became effective from 1 July 2003. This should now create an environment conducive to service delivery.

### **5.5.2 Ndlambe Municipality**

The NLM currently undertakes the provider functions for most of the schemes in its region.

The NLM undertakes the reticulation provider functions on all the supply schemes and the bulk provider functions for all schemes except for the Alexandria and Bushmans River Mouth /Kenton-on-Sea schemes. These functions are currently undertaken by a support services agent, under contract to the NLM, and the Albany Coast Water Board (no formal agreement is in place as yet.).

The NLM also undertakes certain WSA functions (i.e. project implementation, setting by-laws, tariffs & regulation). However, as the NLM has been authorised the WSA for its area, it will now be responsible for undertaking the following four authority functions:

- Ensuring access (project planning and implementation).
- Regulations (policy formulation and regulation of by-laws).
- Planning (preparation of a WSDP)
- Determining the provider arrangements (i.e. evaluating and implementing appropriate operation and maintenance systems and procedure).

The provider functions for the water services infrastructure on privately owned land, is the responsibility of the land owner.

### **5.5.3 Cacadu Municipality**

As the Category C municipality for the Cacadu Region, the Cacadu Municipality is responsible for district wide co-ordination and planning. However, it can be noted that the implications of the powers and functions, as they impact on the Cacadu Municipality and its relations with the respective category B municipalities, still need to be clarified with the respective parties.

### **5.5.4 Albany Coast Water Board**

ACWB is a bulk water services provider, authorised by the Department of Water Affairs and Forestry (DWAF), and operates the bulk infrastructure of the Bushmans River Mouth /Kenton-

on-Sea Local Water Supply Scheme. The ACWB's area of jurisdiction extends to the Cannon Rocks / Boknes area, although they are not currently operating in the area.

The ACWB does not have a provider contract with the NLM at present.

### 5.5.5 DWAF

DWAF currently undertakes the functions of Catchment Management Agency (CMA), regulator and WSA (project implementation), but it is in the process of restructuring to address only its legislated functions.

### 5.5.6 SUPPORT SERVICES AGENT

P&S Consulting of Alexandria currently have a contract with the NLM to operate and maintain the bulk supply system of the Alexandria Local Water Supply Scheme.

## 5.6 ORGANISATIONAL ARRANGEMENTS

### 5.6.1 Ndlambe Municipality

Table 7: Directorates Responsible for Water Services Provision

Directorate	Branch	Service Provided
Engineering	Water	Water
	Wastewater	Wastewater / Sanitation
Social Services	Health / Community Services	Sanitation

The organogram of the Ndlambe Municipality can be found in **Annexure D** of this document.

### 5.6.2 Cacadu Municipality

The organogram of the CDM is contained in **Annexure E** of this report. Reports from the CDM indicate that they have a limited staff compliment, having recently undertaken a "right sizing" exercise.

### 5.6.3 Albany Coast Water Board

The ACWB currently has a staff compliment of 6No. people, made-up as follows:-

- 1No. Management

- 1No. Secretary
- 1No. Technician
- 2No. Operators
- 1No. Labourer

It is reported by the ACWB that they have adequate staff levels but would ideally require 1No. additional operator, on a temporary basis, for the peak holiday seasons.

## **5.7 FINANCIAL ARRANGEMENTS**

### **5.7.1 Capital Works Expenditure**

Funding for CAPEX works is generally obtained by the NLM via grant funding. i.e. the NLM seldom raises loan funding to undertake CAPEX works.

Grant funding for CAPEX works is currently received from the following sources:-

- DWAF (Community Water Supply and Sanitation programme);
- DHLG (CMIP programme);

Reports from the CDM indicate that the NLM can anticipate in the order R2.0 million in CAPEX funding per year for the next few years, with the funding being split roughly equally between the respective funders.

It has been reported that the ACWB has in the past raised loan funding for CAPEX works.

The CDM has lost a substantial portion of its levy funding to the Nelson Mandela since the new municipal order, and is therefore no longer able to fund projects within its area of jurisdiction.

### **5.7.2 Operational Works Expenditure**

The OPEX budget of the NLM for the past financial year is as tabulated below.

**Table 8: NLM Operational Budgets for the 2002/2003 Financial Year.**

UNIT / VOTE	OPERATIONAL BUDGET	
	EXPENDITURE	INCOME
Administration	R 1 354 200	R 11 233 000
Connections	R 59 000	R 70 000
Dune supply	R 7 200	R 0
Raw water pumping	R 246 800	R 0
Purification	R 234 500	R 0
Reticulation	R 4 949 400	R 279 400
Reservoirs	R 800 000	R 0
Mansfield Dam	R 600 000	R 0
Sarel Heyward Dam	R 4 800 000	R 0
<b>TOTAL</b>	<b>R 6 866 300</b>	<b>R 11 582 400</b>

**Notes:-**

1. The breakdown of the respective budgets is contained in **Annexure F** of this document.
2. The above budget may only be for the former Port Alfred TLC area.

A directive received from the Department of Finance indicates that both CAPEX and OPEX budgets may in future only be increased by the following percentages, without prior authorisation:-

- 2003 / 4            4.5%
- 2004 / 5            4.0%

### 5.7.3 Operational Income Sources

#### 5.7.3.1 General

The current funding sources to cover the operational expenses of the various institutions are as tabulated below:-

**Table 9: Funding Sources for Operational Expenses**

INSTITUTION	FUNDING SOURCE
NLM	Tariffs and equitable share
ACWB	Tariffs

### 5.7.3.2 Tariffs

The NLM has recently amalgamated their tariff structures and now have uniform tariffs throughout the municipal area region, whilst at the same time providing for:-

- Free Basic Water (first 6000 litres free to indigent consumers only)
- Measures to conserve water (stepped tariffs)

The current tariff structures are contained in **Annexure G** of this document.

The current tariffs of the ACWB are as follows:-

- Bulk tariff to NLM = R2.97 /kl
- Bulk tariff to farmers = R 3.12 / kl

### 5.7.3.3 Equitable Share

Equitable share funding, which is allocated quarterly is intended for the operation and maintenance of all services and to subsidize the provision of free basic services.

Table 10: Equitable Share Funding Allocations

YEAR	AMOUNT R
2002/2003	?
2003/2004	?
2004/2005	?

**Notes:**

- National government only guarantees 80% of the previous year's allocation.

### 5.7.4 Indigent And Free Basic Water Policy

The NLM does provide free basic water to its indigent consumers.

### 5.7.5 Payment Levels

Although exact details have not been ascertained, cost recovery has been reported as being problematic.

## 5.8 BY-LAWS

A copy of the by-laws has not been ascertained, however, it appears that a unified set of by-laws may need to be developed. These by-laws may need to address the provision of water services on private land, especially in the rural context.

## 5.9 KEY FINDINGS

A summary of the key findings from the situation analysis are as follows:

### Community Needs

- Access to an adequate potable water supply services has been identified as the primary development need.

### Socio Economic Issues

- The level of dependency is around 51% (0 – 18 & 65+).
- Approximately 34% of the population is unemployed.
- Nearly 61% of the households have an income of less than R 1500 per month.
- The average income per household is approximately R 1 530 per month.

### Water Resource Issues

- In general, the area has limited access to reliable water resources, both in terms of quantity and quality
- No comprehensive water demand management programmes are currently in place.

### Backlog Issues

- Approximately 13% of the population have access to a water level of service below the RDP standard.
- Approximately 3% of the population have access to a sanitation level of service below the RDP standard.
- The backlogs generally tend to be on privately owned farmlands and in informal settlements. Although backlogs do exist in certain formal urban areas.

### Technical / Infrastructural Issues

- The capacity of the bulk supply infrastructure within the area is generally inadequate to meet the high peak demands experienced in the area.

- Due to the high-holiday influxes, the peak water demands, especially at the coastal resorts, are substantially higher (2-3) than the AADD.
- The capacities of the wastewater treatment works are generally inadequate and sewage discharges into the rivers have been reported.
- Discharges from septic tanks and soakaways are reported during the peak seasons.
- The rate of housing provision exceeds the rate at which bulk infrastructure is being upgraded.

#### **Levels of Service Issues**

- The level of service demanded exceeds the current supply capacity of both the water resource and the bulk infrastructure.
- No formal level of service policy exists at present.
- No policy exists at present to address service provision (basic needs) on private land.

#### **Institutional Issues**

- Although the division of powers and functions have been finalised, the implementation thereof and the relationship between the Cacadu and Ndlambe Municipality still needs to be finalised.
- "Interim" provider arrangements exist at present. There is therefore a need to determine the long-term provider arrangements for the NLM's area of jurisdiction.
- Interim agreement exists with the ACWB at present.
- The full implications of being a WSA are not necessarily understood.

#### **Financial Issues**

- Limited CAPEX grant funding ( $\pm$  R2.0 million per year) is being made available for the NLM.
- Tariff structures currently do not make provision for capital reserves.
- Donor funding has certain requirements, which are often not in-line with the development needs of the NLM.

#### **Organisational Issues**

- Staff shortages and certain organisational inefficiencies have been reported

## **6 DEVELOPMENT FRAMEWORK**

### **6.1 INTRODUCTION TO THE DEVELOPMENT FRAMEWORK**

The Development Framework sets out the direction for future actions for the NLM. These actions can be broadly defined as infrastructure activities (infrastructure which delivers water services) or enabling activities (institutional, organisational, policy or financial management).

The framework therefore sets out a vision, prioritises issues, and sets out objectives and strategies for the municipality to follow. On the basis of this framework, projects are identified, defined and initiated. This is of particular importance in a context of the huge financial and organisational burden needed to provide access to efficient, affordable, economical and sustainable water services.

**Objectives and strategies** therefore have to be strategically focussed on:-

- achieving maximum impacts with limited resources.
- ensuring the integration of water service activities with other sector objectives (and visa versa).
- meeting public expectations.
- meeting constitutional and legal responsibilities.
- ensuring a sustainable process of improvement in service delivery.

Strategies, as far as possible, have to be quantifiable or measurable. This is both to facilitate planning as well as to provide indicators for future performance evaluation.

### **6.2 PRIORITY WATER SERVICES ISSUES OBJECTIVES & STRATEGIES**

From the situation analysis, the key issues identified were consolidated and focused on the following areas.

- Limited raw water supply and poor water quality;
- Bulk Infrastructure is aging and is at Capacity (water & wastewater).
- Basic service backlogs (water & sanitation).
- Limited financial and human resources.
- Institutional and Organisational Inefficiencies.

For each of the priority areas the following framework has been established:

Header	Comment
Causes	The focus of actions in order to resolve the problem
Effects	The visible effects of the problem and the focus for future evaluation as to whether actions have achieved success.
Objectives	What we want to achieve
Strategies	How and what will be done to achieve the objective

### 6.2.1 Issue 1: Limited Raw Water Supply and Poor Water Quality

**Description of Causes:**

- The mean annual runoff in the area is low;
- Current demands are near or exceed the firm yields of existing resources;
- The water quality in the area is in general very poor (geology related);
- The groundwater potential of the region is poor;
- Water use management is not being adequately pursued;
- Alien vegetation is invading the main watercourses and reducing the yields, especially in the Cannon Rocks and inland areas.

**Description of Effects:**

- Restricted ability to support industrial and domestic development in the short-term.
- Potential water shortages in the future.
- High cost of water.

<b>Objective:</b>	
<ul style="list-style-type: none"> <li>• Local augmentation to existing schemes, where feasible, within 5 years.</li> <li>• A regional water supply scheme for the region within 10 years.</li> </ul>	
<b>IDENTIFIED STRATEGIES</b>	
Strategy 1.1	<ul style="list-style-type: none"> <li>• Lobby with DWAF to undertake a water resources situation assessment of the area and to investigate measures to augment supply to the area.</li> </ul>
Strategy 1.2	<ul style="list-style-type: none"> <li>• Implement a water management programme to reduce water losses in the urban centres.</li> <li>• The initiative is to include community participation and education, review of the tariffs and a debt collection drive with the assistance of the ward councillors.</li> </ul>

Strategy	1.3	<ul style="list-style-type: none"> <li>Lobby DWAF to undertake a working for water programme in the areas affected by alien vegetation invasion.</li> </ul>
Strategy	1.4	<ul style="list-style-type: none"> <li>Investigate alternative sources e.g. recycling.</li> </ul>

**6.2.2 Issue 2 : Bulk Infrastructure is Aging and is at Capacity**

**Description of Causes**

- High seasonal peak demands.
- Housing provision exceeds the rate at which bulk infrastructure is upgraded.
- The provision of adequate bulk sanitation is often overlooked.
- Limited access to financial resources
- High level of service standards.
- Limited routine and preventative maintenance.

**Description of Effects**

- Limited capacity to support development.
- Supply shortages/interruptions and /or restrictions, especially during peak demand periods.
- Pollution/contamination of the environment.
- High water costs and wastage.

**Objectives:**

- Adequate bulk infrastructure capacity to support development within 10 years.
- All wastewater treatment works comply with their permit requirements within 5 years.
- Effective preventative and routine maintenance systems on all schemes within 2 years.

**IDENTIFIED STRATEGIES**

Strategy	2.1	<ul style="list-style-type: none"> <li>Progressively upgrade existing and build new infrastructure, focussing on areas with current shortages and identified development areas. - Water and sanitation</li> </ul>
Strategy	2.1	<ul style="list-style-type: none"> <li>Identify and resolve high impact problems areas (in terms of both pollution and ability to service new development. – Sanitation</li> </ul>
Strategy	2.2	<ul style="list-style-type: none"> <li>Develop and implement routine and preventative systems on all schemes.</li> </ul>

### 6.2.3 Issue 3 :Basic Service Backlogs

**Descriptions of Causes**

- Policies of neglect by previous authorities.
- Migration of people from the rural to the urban areas
- No policy to address basic service backlogs on private land.

**Descriptions of Effects**

- Low quality of life.
- Low health and hygiene standards;
- Dissatisfaction among residents.

<b>Objectives:</b>		
<ul style="list-style-type: none"> <li>• Eradicated backlogs within 5 years.</li> </ul>		
<b>IDENTIFIED STRATEGIES</b>		
Strategy	3.1	<ul style="list-style-type: none"> <li>• Provide access to a basic level of service, provided the level of service does not negatively impact on the environment. I.e. in accordance with the DWAF groundwater protocol for sanitation.</li> <li>• Progressively upgrade the level of service from a basic level to higher one, as the bulk infrastructure and financial resources permit.</li> </ul>

### 6.2.4 Issue 4 : Limited Financial and Human Resources

**Description of Causes**

- No capital reserves.
- Tariffs do not make provision for capital reserves.
- Limited grant funding available for the region for upgrading and provision of new bulk infrastructure.
- Constraints imposed on funding by certain donors.
- Inability to attract appropriate staff.

**Description of Effects**

- Slow pace of service delivery.
- Unsustainable development.

- Crisis management
- Low staff morale.

<b>Objectives:</b>	
<ul style="list-style-type: none"> <li>• Capital reserves to undertake CAPEX works within 5 years.</li> <li>• An adequate resourced and capacitated institution within 5 years</li> </ul>	
<b>IDENTIFIED STRATEGIES</b>	
Strategy 4.1	<ul style="list-style-type: none"> <li>• Review the tariff structures.</li> </ul>
Strategy 4.2	<ul style="list-style-type: none"> <li>• Lobby for additional grant funding</li> </ul>
Strategy 4.3	<ul style="list-style-type: none"> <li>• Recruit and train the necessary human resources.</li> </ul>

**6.2.5 Issue 5 : Institutional and Organisational Inefficiencies**

**Description of Causes**

- The powers and functions relating to water services have only recently been finalised.

**Description of Effects**

- Lack of clarity regarding powers and functions.
- Certain policy decisions have not been taken as yet.

<b>Objectives:</b>	
<ul style="list-style-type: none"> <li>• A capacitated institution effectively undertaking its authority functions within 5 years.</li> </ul>	
<b>IDENTIFIED STRATEGIES</b>	
Strategy 5.1	<ul style="list-style-type: none"> <li>• Implement a water services authority capacity building programme in conjunction with the CDM.</li> </ul>

**6.3 SPATIAL DEVELOPMENT FRAMEWORK**

A Spatial Development Framework (SDF) describes in words and illustrations how the Municipality sees desirable future patterns of land use and development in its area of

jurisdiction. In essence, it is the Municipality’s spatial “vision” of what the Ndlambe Municipality area will look like in years to come.

The SDF is a legally enforceable component of the IDP, which indicates both to the Municipality (councillors and officials) and to the public (developers, landowners, etc.) where certain types of land use and associated developments are permissible, and where certain activities are unlikely to be permitted.

The SDF is also a tool which can assist the Municipality with project prioritisation. However, as the SDF has not been finalised as yet, programmes and projects have been prioritised on the basis of perceived needs.

## 7 PROGRAMMES

### 7.1 INTRODUCTION

A number of broad programmes have been identified to address the water services needs of the Ndlambe Municipality, they are:-

- A water management programme.
- An expansion, refurbishment and upgrading programme.
- A basic services backlog programme.
- An institutional programme.

### 7.2 WATER MANAGEMENT PROGRAMME

The limited water supply is one of the most critical factors that could limit development within Ndlambe, and therefore all programmes need to take cognisance of this fact. This programme would include:-

- A water supply /demand management sub-programme.
- A raw water augmentation sub-programme.

The approach to this programme would therefore be as follows:

#### **Short-term**

- Implement demand / supply management initiatives;
- Undertake studies to investigate alternative water supplies;
- Systematically replace aging reticulation;
- Eradicate alien vegetation in the river catchments.

#### **Medium to Long-term**

- Undertake capital works projects.

The demand management sub-programmes would focus on the entire region whilst the augmentation programmes would focus on the Port Alfred/Bathurst, Bushmans River Mouth/Kenton-on-Sea and Cannon Rocks areas in the short-term and the entire region in the long term.

The sources of funding for this programme would include:

- CMIP, DWAF and internal for demand/supply management projects.
- The other initiatives would probably need to be undertaken and funded by DWAF with possible top-up funding from CMIP.

### **7.3 EXPANSION , REFURBISHMENT AND UPGRADING PROGRAMME**

This programme would focus on upgrading existing or providing new bulk and connector infrastructure to meet the development needs of the NLM and would to a large extent support the envisaged housing programmes.

CMIP funding would be the most likely funding source for these projects. The focus areas for this programme in the short-term would include:

- Port Alfred
- Alexandria
- Bushmans River / Kenton-on-Sea

### **7.4 BASIC SERVICES BACKLOGS PROGRAMME**

This programme would focus at providing access to basic services to those areas which currently do not have access to a basic level of service. The focus would primarily be in the rural areas, and the former townships and informal settlements.

The provision of services to informal settlements can however be seen as a temporary measure, as these settlements would form part of the municipality's housing backlog programme.

The funding sources for these programmes would include:-

- DWAF, primarily for the rural areas.
- Internal sources for temporary supplies to informal areas.

## **7.5 INSTITUTIONAL PROGRAMME**

This programme would focus at developing the required WSA capacity of the NLM to effectively and efficiently undertake its required functions and would include an evaluation of the long-term provision arrangements, as required in terms of section 76 of the Municipal Systems Act.

Funding for these initiatives could be sourced from:-

- DWAF/DPLG : WSA capacity building;
- DWAF : Section 78 investigation of the provider arrangements.

## **8 FINANCIAL PLAN**

### **8.1 AVAILABLE CAPITAL WORKS BUDGETS**

As stated previously, approximately R2.0 million per year is available for the next few years to undertake CAPEX works. The funding is split roughly equally between CMIP and DWAF funding.

### **8.2 REQUIRED CAPITAL WORK BUDGETS**

First order estimates indicate that:

- Some R 10 million is required to provide all households with at least a basic level of service.
- Some R 92 million is required to provide all households with yard connections and waterborne sanitation. This amount excludes source development costs.
- Earlier research indicates resource development costs in the order of R300 million.

The prioritised project list for the municipality is contained in **Annexure H** of this document.

### **8.3 AVAILABLE OPERATIONAL / REVENUE BUDGETS**

Available revenue budgets have not been obtained.

### **8.4 REQUIRED OPERATIONAL / REVENUE BUDGETS**

First order estimates indicate an expenditure requirement of some R 9 million, given the current level of service. The incremental increases, given the various levels of service provision, are as follows:

- All households have access to basic services: R 500 000.
- All households have erf water connections and waterborne sanitation : R7 500 000.

## 9 INSTITUTIONAL PLAN

As a water service authority, the NLM is required to perform the following functions, in terms of ensuring access to water services for its constituents:-

- Ensuring access, including:-
  - Policy development;
  - Tariff determination;
  - Financial planning and management;
  - Infrastructure development
  - Water conservation and demand management;
  - Performance management and monitoring;
  - Information sharing and communication with stakeholders;
  - Sanitation, health and hygiene promotion.
  
- Regulation, including:-
  - Establishing by-laws;
  - Regulation of compliance with by-laws.
  
- Planning, including:-
  - Information management;
  - WSDP planning;
  - Monitoring the implementation of the WSDP;
  - Reporting on the implementation of the WSDP.
  
- Provision (operation and maintenance), including:-
  - Decision making regarding provision institutional arrangements;
  - Support to water services providers;
  - Record keeping;
  - Water services provider contractual management;
  - Monitoring water services providers for compliance;
  - Transfer of water services schemes.

In terms of Section 76 of the Municipal Systems Act, the Municipality is required to either:-

- Undertake the function in-house (internal model);
- Get an external organisation to undertake the function (external model), or;
- Adopt a combination of the above.

The process to develop the required WSA capacity and the long-term provider arrangements for the Ndlambe Municipality are initiatives that will take place subsequent to the completion of the WSDP. It is anticipated that the WSA capacity building initiative of the CDM will assist in this regard and will in fact constitute the institutional plan of the Municipality, in terms of water services provision

## 10 REFERENCES

1. Ndlambe Municipality Integrated Development Plan (March 2002)
2. Ndlambe Municipality : Reviewed Integrated Development Plan (May 2003)
3. Cacadu District Municipality Integrated Development Plan (March 2002)
4. Western District Council Water Services Development Plan (1999)  
Ninham Shand Consulting Engineers
5. Eastern Cape Water Resources Situation Assessment (June 1999)  
Ninham Shand Consulting Engineers
6. Fish to Tsitsikamma Water Management Area : Water Resources Situation Assessment  
(August 2002)  
Ninham Shand Consulting Engineers
7. Operating and Maintenance Manual for the safety of the Sarel Haywood Dam : Ninham  
Shand Consulting Engineers
8. Kwezi V3 Engineers Technical Report on MAAP Project No. CWSEC/1/26 (July 2002)

**ANNEXURE A**  
**PIMSS DATABASE INFORMATION**

**NDLAMBE MUNICIPALITY (EC 105) - PIMSS DATA**

Ward ID	Ward		Population		Race					Gender		Age						
	Ward Number	Area Km <sup>2</sup>	Total Population		African	Coloured	Indian	White	Other	Male	Female	0-4	5-19	20-29	30-49	50-64	Over 65	Unknown
21005001	1	100	7073		6601	326	0	96	50	3176	3900	701	2550	1262	1468	612	412	66
21005002	2	247	3697		1661	985	5	1019	27	1751	1948	314	1160	554	834	438	368	25
21005003	3	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
21005004	4	447	5880		4948	18	0	901	13	2771	3103	452	1790	1024	1292	656	567	74
21005005	5	213	5739		5281	13	4	368	73	2708	3016	490	1965	943	1202	526	443	159
21005006	6	613	3108		2520	22	0	487	79	1509	1596	245	937	516	755	361	266	55
21005007	7	19	4595		540	1129	14	2850	62	2201	2381	271	839	556	980	776	961	205
21005008	8	2	7550		7471	20	0	0	59	3506	4039	670	2409	1414	1741	584	469	275
21005009	9	1	4703		4632	23	0	0	48	2168	2530	370	1346	857	1090	452	303	257
		<b>1642</b>	<b>42345</b>		<b>79.5%</b>	<b>6.0%</b>	<b>0.1%</b>	<b>13.5%</b>	<b>1.0%</b>	<b>46.8%</b>	<b>53.2%</b>	<b>8.3%</b>	<b>30.7%</b>	<b>16.8%</b>	<b>22.1%</b>	<b>10.4%</b>	<b>9.0%</b>	<b>2.6%</b>

**NDLAMBE MUNICIPALITY (EC 105) - PIMSS DATA**

Ward ID	Ward Number	Area Km <sup>2</sup>	Employment			Under 15	N/A	Occupation									
			Employed	Unemployed	Unknown			Senior Management	Professional	Technical	Clerks	Service Related	Skilled	Craft and Trade	Plant Machine	Elementary	
21005001	1	100	861	1130	12	2443	0	11	53	19	20	33	63	47	46	438	
21005002	2	247	1045	201	0	1088	114	36	88	45	82	68	97	76	47	467	
21005003	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21005004	4	447	1633	592	6	1686	25	62	66	49	40	45	182	149	76	875	
21005005	5	213	1131	588	14	1876	2	34	62	30	29	60	466	58	70	257	
21005006	6	613	1065	176	0	896	17	33	38	19	30	35	286	67	41	387	
21005007	7	19	1145	175	12	751	473	93	105	158	115	146	37	183	9	124	
21005008	8	2	1289	1120	47	2252	0	17	67	28	44	79	79	186	43	613	
21005009	9	1	812	826	36	1250	0	19	108	23	27	100	56	77	35	333	
		1642	33.5%	17.9%	0.5%	45.7%	2.4%	3.7%	7.2%	4.5%	4.7%	6.9%	15.5%	10.3%	4.5%	42.7%	

**NDLAMBE MUNICIPALITY (EC 105) - PIMSS DATA**

Ward ID	Ward Number	Area Km <sup>2</sup>	Industry														
			Farming	Mining	Manufacturing	Utilities	Construction	Trade	Transport	Business	Social Service	Private Household	Ex Territorial	Diplomatic	NEC	NA1	Institution
21005001	1	100	174	4	142	11	33	37	22	11	100	94	11	4	242	6214	0
21005002	2	247	406	4	111	16	38	108	39	63	124	79	0	0	83	2538	114
21005003	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21005004	4	447	851	0	68	17	112	126	26	50	108	228	4	0	60	4211	23
21005005	5	213	547	5	39	1	38	53	13	11	142	156	0	0	136	4591	2
21005006	6	613	405	3	32	4	33	50	8	28	65	199	0	0	250	2023	17
21005007	7	19	39	6	75	16	123	236	39	114	273	89	0	0	160	2965	473
21005008	8	2	51	10	50	3	150	137	42	19	162	409	0	0	277	6261	0
21005009	9	1	8	3	23	8	57	91	19	23	169	232	0	0	211	3889	0
		<b>1642</b>	<b>5.8%</b>	<b>0.1%</b>	<b>1.3%</b>	<b>0.2%</b>	<b>1.4%</b>	<b>2.0%</b>	<b>0.5%</b>	<b>0.8%</b>	<b>2.7%</b>	<b>3.5%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>3.3%</b>	<b>77.0%</b>	<b>1.5%</b>

NDLAMBE MUNICIPALITY (EC 105) - PIMSS DATA

Ward ID	Ward Number	Area Km <sup>2</sup>	None	Annual Individual Income															
				R1 - 2400	R2401 - 6000	R6001 - 12000	R12001 - 18000	R18001 - 30000	R30001 - 42000	R42001 - 54000	R54001 - 72000	R72001 - 96000	R96001 - 132000	R132001 - 192000	R192001 - 350000	Over R350000	Unspecified	N/A	
21005001	1	100	4597	185	1001	215	68	89	25	10	11	1	1	1	2	1	2	863	0
21005002	2	247	1877	228	538	171	148	147	90	76	58	36	28	0	16	0	5	162	113
21005003	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21005004	4	447	3096	459	1136	263	118	153	100	72	94	18	35	6	13	6	4	287	29
21005005	5	213	3664	410	859	211	113	45	46	21	23	19	0	5	1	5	0	309	3
21005006	6	613	1154	371	514	142	59	56	31	38	62	9	20	5	9	5	7	603	19
21005007	7	19	878	94	351	270	253	340	248	185	159	62	41	20	26	20	7	1169	474
21005008	8	2	2858	339	1106	373	122	50	11	3	40	1	1	0	0	0	0	2647	0
21005009	9	1	2905	170	868	209	81	50	36	16	14	3	0	1	0	1	0	344	0
		1642	49,7%	5,3%	15,1%	4,4%	2,3%	2,2%	1,4%	1,0%	1,1%	0,4%	0,3%	0,2%	0,1%	0,1%	0,1%	15,1%	1,5%





**NDLAMBE MUNICIPALITY (EC 105) - PIMSS DATA**

Ward ID	Ward		Sanitation						Water						
	Ward Number	Area Km <sup>2</sup>	Flush	Pit Latrine	Bucket Latrine	None	Unspecified	Water Dwelling	On Siter	Public Tap	Tanker	Borehole	Natural	Other	Unspecified
21005001	1	100	635	683	19	103	6	313	396	584	0	91	56	0	6
21005002	2	247	564	172	8	166	1	572	79	14	7	206	32	0	1
21005003	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21005004	4	447	463	737	3	341	0	372	130	770	20	187	64	0	1
21005005	5	213	172	935	1	116	8	310	333	246	15	235	86	0	7
21005006	6	613	217	334	1	246	3	116	71	230	18	244	118	0	4
21005007	7	19	1537	2	0	26	6	1500	25	32	0	9	0	0	5
21005008	8	2	213	1479	11	39	34	43	6	1687	6	1	0	0	33
21005009	9	1	203	880	9	5	10	24	6	1066	3	0	0	1	7
		<b>1642</b>	<b>38.5%</b>	<b>54.2%</b>	<b>1.0%</b>	<b>10.4%</b>	<b>0.8%</b>	<b>31.3%</b>	<b>10.1%</b>	<b>44.6%</b>	<b>0.7%</b>	<b>9.4%</b>	<b>3.4%</b>	<b>0.0%</b>	<b>0.6%</b>

**ANNEXURE B**  
**DWAF DATABASE INFORMATION**

**NDLAMBE MUNICIPALITY (EC105)**  
DWAf National Database Information

X_COORD	Y_COORD	USERNAME	SUBURBNAME	URBAN/RURAL	COMMUNITY	POPULATION	TOTMALE	TOTFEMALE	TOTCHILD	MALE0_18	MALE19_64	MALE65PLUS	FEMALE0_18	FEMALE19_64	FEMALE65PL
26.54709	-33.74812	CANNON ROCKS		r	A2	2950	858	907	1185	563	628	230	622	715	192
26.55000	-33.49170	FARMERS FIELD (SOUTHALL)		r	E	4	1	1	2	1	1	0	1	1	0
26.86470	-33.44440	TRAPPS VALLEY		r	E	100	33	36	31	17	28	4	14	30	6
27.05043	-33.53555	KLEINMONDE		u	A2	1477	453	442	582	318	312	141	264	301	141
27.01327	-33.49511	POMEROY		r	A2	6568	2017	1953	2588	1255	1610	407	1333	1692	271
27.03833	-33.49227	LANKUS FARM		r	E	497	153	148	196	96	130	23	100	121	27
27.05373	-33.49216	SHERADEEN		r	E	463	142	138	183	89	121	21	55	67	15
27.08029	-33.49195	KINGFISHER		r	E	273	84	82	107	52	72	12	55	72	15
27.10599	-33.49043	KLEINSPRUIT		r	E	445	136	133	176	86	116	20	90	109	24
27.06204	-33.48977	OUR HAVEN		r	E	283	87	85	111	54	74	13	57	70	15
27.06529	-33.48448	SOUTH SEAS		r	E	331	102	99	130	63	87	15	67	81	18
27.05316	-33.48261	QUETU		r	E	458	141	137	180	88	120	21	92	112	25
27.02442	-33.47266	DELAMER		r	E	1228	376	367	483	236	320	56	247	301	66
27.00543	-33.45994	GRASSMERE		r	E	558	171	167	220	108	145	26	112	137	30
27.05865	-33.46467	WYLLINGTON		r	E	711	218	213	280	137	185	33	143	175	38
27.07490	-33.47401	QETU		r	E	569	181	176	232	114	154	27	118	144	32
27.01889	-33.44916	SPANISH REEDS		r	E	543	167	162	214	105	142	25	109	133	29
27.05003	-33.4682	CROSS ROADS - B		r	E	643	198	192	253	124	169	29	129	158	34
27.13130	-33.49775	FISH RIVER MOUTH		r	A2	524	161	156	207	101	137	24	105	128	28
27.01933	-33.43657	ENTERPRISE		r	E	904	278	270	356	174	237	41	182	222	48
27.03856	-33.43857	CLAYTONVILLE		r	E	957	294	286	377	185	250	44	192	235	51
27.03008	-33.42804	OSBORNE		r	E	546	168	161	215	105	143	25	110	134	29
27.01452	-33.41013	GLENDEENING		r	E	460	141	138	181	88	120	21	93	113	25
27.01452	-33.40438	ALLENBY		r	E	438	135	131	172	87	108	27	85	114	17
26.83604	-33.49062	BATHURST	NOLUKHANYO	u	A3	3832	1177	1145	1510	622	1034	143	688	898	247
26.82823	-33.50426	BATHURST	BATHURST PROPER	u	A2	5000	1624	1680	1696	827	854	770	869	924	756
26.84004	-33.48427	BATHURST	FREESTONE	u	SQU	1808	555	541	712	389	481	74	323	439	102
26.41246	-33.65031	ALEXANDRIA	ALEXANDRIA	u	A2	1750	632	681	437	168	502	130	269	543	138
26.41609	-33.64950	ALEXANDRIA	WENZELSPARK	u	A3	2552	742	785	1025	503	677	65	522	707	78
26.42444	-33.66198	ALEXANDRIA	KWANONQUBELA	u	A3	923	268	284	371	173	254	14	188	247	37
26.67029	-33.68123	KENTON-ON-SEA	KENTON-ON-SEA	u	A2	6051	3167	3276	3307	1708	1424	1743	1599	171	3105
26.66602	-33.67353	KENTON-ON-SEA	EKUPHUMLENI	u	A3	1686	509	639	538	307	424	85	231	567	72
			BUSHMANS	u		3699									
26.63458	-33.68037	ALEXANDRIA/BUSHI	KLIPFONTEIN	u	SQU	713	258	277	178	100	228	30	78	237	40
26.65178	-33.68182	BUSHMANS	MARSELLE	u	A2	2552	742	785	1025	600	709	33	425	735	50
26.89533	-33.60089	PORT ALFRED	PORT ALFRED	u	A2	5006	1977	2376	653	382	1423	554	271	1637	739
26.88353	-33.57796	PORT ALFRED	OLD NEMATO	u	A3	8072	2668	3211	2193	1224	2307	361	959	2935	276
26.89455	-33.58602	PORT ALFRED	STATION HILL	u	A3	2880	995	1138	747	400	740	255	347	691	447
26.89255	-33.56805	PORT ALFRED	MIMOSA FARM	u	A3	4508	1390	1720	1398	485	1315	75	913	1627	93
26.57911	-33.73067	RICHMOND/Boknes		r	A2	923	268	284	371	171	173	95	150	113	113
26.73602	-33.64827	KASUKA		r	E	933	287	279	367	195	260	27	172	249	30
				r		74836	23954	25693	25189	12750	18215	5739	12439	18184	7509

**NDLAMBE MUNICIPALITY (EC105)**  
**DWAF National Database Information**

X_COORD	Y_COORD	USERNAME	SUBURNAME	URBAN/RURAL	COMMUNITYT	POPULATION	%	Yard	%	Communal	%	Sub-RDP/None
26.54709	-33.74812	CANNON ROCKS		r	A2	2950	100%	2950	0%	0	0%	0
26.55000	-33.49170	FARMERS FIELD (SOUTHALL)		r	E	4	0%	0	100%	4	0%	0
26.88470	-33.44440	TRAPPS VALLEY		r	E	100	0%	0	0%	0	100%	100
27.05043	-33.53555	KLEINMONDE		u	A2	1477	100%	1477	0%	0	0%	0
27.01327	-33.49511	POMEROY		r	A2	6568	0%	0	100%	6568	0%	0
27.03833	-33.49227	LANKUS FARM		r	E	497	0%	0	100%	497	0%	0
27.05373	-33.49216	SHERADEEN		r	E	453	0%	0	100%	463	0%	0
27.08029	-33.49195	KINGFISHER		r	E	273	0%	0	100%	273	0%	0
27.10599	-33.49043	KLEINSPRUIT		r	E	445	0%	0	100%	445	0%	0
27.06204	-33.48977	OUR HAVEN		r	E	283	0%	0	100%	283	0%	0
27.06529	-33.48448	SOUTH SEAS		r	E	331	0%	0	100%	331	0%	0
27.05316	-33.48261	QUETU		r	E	458	0%	0	100%	458	0%	0
27.02442	-33.47266	DELAMER		r	E	1226	0%	0	100%	1226	0%	0
27.00543	-33.45994	GRASSMERE		r	E	558	0%	0	0%	0	100%	558
27.05865	-33.46467	WYLMINGTON		r	E	711	0%	0	0%	0	100%	711
27.07490	-33.47401	QETU		r	E	589	0%	0	100%	589	0%	0
27.01889	-33.44916	SPANISH REEDS		r	E	543	0%	0	100%	543	0%	0
27.05003	-33.44692	CROSS ROADS - B		r	E	643	0%	0	100%	643	0%	0
27.13130	-33.49775	FISH RIVER MOUTH		r	E	524	100%	524	0%	0	0%	0
27.01933	-33.43657	ENTERPRISE		r	A2	904	0%	0	100%	904	0%	0
27.03856	-33.43857	CLAYTONVILLE		r	E	957	0%	0	100%	957	0%	0
27.03847	-33.42804	OSBORNE		r	E	546	0%	0	100%	546	0%	0
27.03008	-33.41013	GLENDEENING		r	E	460	0%	0	100%	460	0%	0
27.01452	-33.40438	ALLENBY		r	E	438	0%	0	100%	438	0%	0
26.83604	-33.49062	BATHURST	NOLUKHANYO	u	A3	3832	100%	3832	0%	0	0%	0
26.82823	-33.50426	BATHURST	BATHURST PROPER	u	A2	5000	20%	1000	0%	0	80%	4000
26.84004	-33.48427	BATHURST	FREESTONE	u	A2	1808	100%	1808	0%	0	0%	0
26.41246	-33.65031	ALEXANDRIA	ALEXANDRIA	u	A2	1750	100%	1750	0%	0	0%	0
26.41609	-33.64950	ALEXANDRIA	WENTZELSPARK	u	A3	2552	100%	2552	0%	0	0%	0
26.42444	-33.66198	ALEXANDRIA	KWANONQUBELA	u	A3	923	73%	678	25.7%	237	0.8%	7
26.67029	-33.68123	KENTON-ON-SEA	KENTON-ON-SEA	u	A2	6051	100%	6051	0%	0	0%	0
26.66602	-33.67353	KENTON-ON-SEA	EKUPHUMLENI	u	A3	1686	100%	1686	0%	0	0%	0
			BUSHMANS	u		3699	100%	3699	0%	0	0%	0
26.63456	-33.68037	ALEXANDRIA/BUSH	BUSHMANS	u	SQU	713	100%	713	0%	0	0%	0
26.65178	-33.68182	BUSHMANS	MARSELLE	u	A2	2552	100%	2552	0%	0	0%	0
26.89533	-33.60089	PORT ALFRED	PORT ALFRED	u	A2	5006	100%	5006	0%	0	0%	0
26.88353	-33.57796	PORT ALFRED	OLD NEMATO	u	A3	8072	60%	4843	20%	1614	20%	1614
26.89455	-33.58602	PORT ALFRED	STATION HILL	u	A3	2880	100%	2880	0%	0	0%	0
26.89255	-33.56805	PORT ALFRED	MIMOSA FARM	u	A3	4508	60%	2705	20%	902	20%	902
26.57911	-33.73067	RICHMOND/Boknes		r	A2	923	0%	0	0%	0	100%	923
26.73602	-33.64827	KASUKA		r	E	933	0%	0	100%	933	0%	0
						74836		62.4%		24.9%		12.6%

**NDLAMBE MUNICIPALITY (EC105)**  
**DWAF National Database Information**

X_COORD	Y_COORD	USERNAME	SUBURNAME	URBAN/RURAL	COMMUNITY	POPULATION	%	Sewer	Sanitation	onserve/Sept	%	RDP	%	Sub-RDP/None
26.54709	-33.74812	CANNON ROCKS		r	A2	2950	0%	0	100%	2950	0%	0	0%	0
26.55000	-33.49170	FARMERS FIELD (SOUTHALL)		r	E	4	0%	0	0%	0	0%	0	100%	4
26.86470	-33.44440	TRAPPS VALLEY		r	E	100	0%	0	0%	0	0%	0	100%	100
27.05043	-33.53555	KLEINMONDE		u	A2	1477	0%	0	100%	1477	0%	0	0%	0
27.01327	-33.49511	POMEROY		u	A2	6568	0%	0	0%	0	100%	6568	0%	0
27.03833	-33.49227	LANKUS FARM		r	E	497	0%	0	0%	0	100%	497	0%	0
27.05373	-33.49216	SHERADEEN		r	E	463	0%	0	0%	0	100%	463	0%	0
27.08029	-33.49195	KINGFISHER		r	E	273	0%	0	0%	0	100%	273	0%	0
27.10599	-33.49043	KLEINSPRUIT		r	E	445	0%	0	0%	0	100%	445	0%	0
27.06204	-33.48977	OUR HAVEN		r	E	283	0%	0	0%	0	100%	283	0%	0
27.06529	-33.48448	SOUTH SEAS		r	E	331	0%	0	0%	0	100%	331	0%	0
27.05316	-33.48261	QUETU		r	E	458	0%	0	0%	0	100%	458	0%	0
27.02442	-33.47266	DELAMER		r	E	1226	0%	0	0%	0	100%	1226	0%	0
27.00543	-33.45994	GRASSMERE		r	E	558	0%	0	0%	0	0%	0	100%	558
27.05865	-33.46467	WYLMINGTON		r	E	711	0%	0	0%	0	0%	0	100%	711
27.07490	-33.47401	QETU		r	E	589	0%	0	0%	0	100%	589	0%	0
27.01889	-33.44916	SPANISH REEDS		r	E	543	0%	0	0%	0	100%	543	0%	0
27.05003	-33.44692	CROSS ROADS - B		r	E	643	0%	0	0%	0	0%	0	100%	643
27.13130	-33.49775	FISH RIVER MOUTH		r	E	524	0%	0	0%	524	0%	0	0%	0
27.01933	-33.43657	ENTERPRISE		r	E	904	0%	0	0%	0	100%	904	0%	0
27.03856	-33.43857	CLAYTONVILLE		r	E	957	0%	0	0%	0	100%	957	0%	0
27.03847	-33.42804	OSBORNE		r	E	546	0%	0	0%	0	100%	546	0%	0
27.03008	-33.41013	GLENDENNING		r	E	460	0%	0	0%	0	100%	460	0%	0
27.01452	-33.40438	ALLENBY		r	E	438	0%	0	0%	0	100%	438	0%	0
26.83604	-33.49062	BATHURST	NOLUKHANYO	u	A3	3832	0%	0	100%	3832	0%	0	0%	0
26.82823	-33.50426	BATHURST	BATHURST PROPER	u	A2	5000	0%	0	100%	5000	0%	0	0%	0
26.84004	-33.48427	BATHURST	FREESTONE	u	A2	1808	0%	0	100%	1808	0%	0	0%	0
26.41246	-33.65031	ALEXANDRIA	ALEXANDRIA	u	SQU	1750	0%	0	100%	1750	0%	0	0%	0
26.42444	-33.64950	ALEXANDRIA	WENTZELSPARK	u	A3	2552	82.2%	2098	0%	0	9%	227	9%	227
26.67029	-33.66198	ALEXANDRIA	KWANONQUBELA	u	A3	923	73%	678	0%	0	13%	122	13%	122
26.66602	-33.68123	KENTON-ON-SEA	KENTON-ON-SEA	u	A2	6051	0%	0	100%	6051	0%	0	0%	0
	-33.67353	KENTON-ON-SEA	EKUPHUMLENI	u	A3	1686	100%	1686	0%	0	0%	0	0%	0
		BUSHMANS	BUSHMANS	u		3699	0%	0	100%	3699	0%	0	0%	0
26.63458	-33.68037	ALEXANDRIA/BUSH	KLIPFONTEIN	u	SQU	713	100%	713	0%	0	0%	0	0%	0
26.65178	-33.68182	BUSHMANS	MARSELLE	u	A2	2552	100%	2552	0%	0	0%	0	0%	0
26.89533	-33.60089	PORT ALFRED	PORT ALFRED	u	A2	5006	40%	2002	60%	3004	0%	0	0%	0
26.88353	-33.57796	PORT ALFRED	OLD NEMATO	u	A3	8072	50%	4036	0%	0	50%	4036	0%	0
26.89455	-33.58602	PORT ALFRED	STATION HILL	u	A3	2880	90%	2592	10%	288	0%	0	0%	0
26.89255	-33.56805	PORT ALFRED	MIMOSA FARM	u	A3	4508	0%	0	0%	0	100%	4508	0%	0
26.57911	-33.73067	RICHMOND/Boknes		r	A2	923	0%	0	0%	0	100%	923	0%	0
26.73602	-33.64827	KASUKA		r	E	933	0%	0	100%	933	0%	0	0%	0
						74836		21,9%		41,8%		33,1%		3,2%

**ANNEXURE C**  
**TECHNICAL DATASHEETS ON THE**  
**WATER SERVICES INFRASTRUCTURE**

## ALEXANDRIA

### WATER SERVICES DATA SHEET

#### 1. DESCRIPTION OF THE SUPPLY AREA

The supply area includes the town of Alexandria and the former townships of Wentzel Park and KwaNonqubela.

#### 2. DESCRIPTION OF THE INFRASTRUCTURE

##### 2.1 Water

Raw water is obtained from a series of coastal springs near Cape Padrone and from 2No. boreholes near Fishkraal. Both sources are located some 15 km south east of Alexandria near the coastline.

The water from the boreholes and the springs is pumped to a balancing reservoir located some 10km from Alexandria and then pumped to the main storage reservoir located to the west of Alexandria. Water is then gravity fed through the reticulation network to consumers.

See the layout schematic of the scheme at the end of the data sheets.

##### 2.2 Sanitation

The wastewater from these areas drain into an oxidation pond system, complete with irrigation system.

#### 3. DATA ON THE SUPPLY AREA

No	Name	Households	Population	Level of Service	Comment
1	Alexandria	300	1200	100% yard connection 100% sewerred	40 low income households
2	Wentzel Park	450	2680	100% yard connection 80% sewerred	200 low income households
3	KwaNonqubela	2500	14800	100% yard connection 40% sewerred	1450 low income households

(Ref Kwezi V3)

#### 4. INFRASTRUCTURE COMPONENTS REF: KWEZI V3

##### 4.1 Water

Component	Capacity	Comment
Fountains /Springs	Drought : 10l/s (864 m <sup>3</sup> /day) Normal : 16 l/s (1382 m <sup>3</sup> /day)	
Fountains pump station and pumping mains	Q=18l/s (1555 m <sup>3</sup> /day) L=2320m h= 122 m (static) Ø= 100/125mm AC	Adequate capacity
Boreholes / well points (Fishkraal)	Q=2 x 6 l/s = 12l/s (1037 m <sup>3</sup> /day)	Adequate yield if used conjunctively with the springs to beyond 2005 Qtotal = 22 l/s Qpeak = 20 l/s (2005)
Primarily pump station and pumping main	Q=15 l/s (1296 m <sup>3</sup> /day) L= ? m h= ? m (static) Ø= ? mm AC	Adequate capacity
Balancing Reservoir	265m <sup>3</sup>	4 hours of AADD <sub>2000</sub>
Main pump station and pumping main to air vent	Q=19l/s (1642 m <sup>3</sup> /day) L= 6220 m h= ? m Q= 150 mm AC  L= 900 m Ø= 150 mm (ductile iron)	Limiting factor to meet peak demands  Operating in parallel with the existing main. Part of ongoing upgrade.
Gravity main air vent reservoir	Q= ? L=8500 m h= ? m Ø= 150 mm AC  L=1900 m h= 66 m C Ø= 200 uPVC	Limiting factor to meet peak demands  Operating in parallel Part of ongoing upgrade.
Reservoir	3400 m <sup>3</sup>	50 hours AADD <sub>2005</sub> storage

<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• AADD (current) = 1300 -1400 m<sup>3</sup>/day ( 15.6 l/s)</li> <li>• Peak demands 1600 – 1700 m<sup>3</sup>/day ( 19.1 l/s) ; PF=2.23</li> <li>• Current capacity of system = 19 l/s</li> <li>• AADD (2005) = 1608 m<sup>3</sup>/day (18.6 l/s)</li> <li>• AADD (2010) = 1742 m<sup>3</sup>/day (20.2 l/s)</li> <li>• Only chlorination takes place.</li> </ul>
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**4.2 Sanitation**

Component	Capacity	Comments
Oxidation ponds	Primarily ponds : 5400 m <sup>2</sup> Secondary ponds : 46 300m <sup>2</sup>	Capacity of the system is unknown

**5. KEY ISSUES**

**5.1 Water**

- The conveyance system from the balancing reservoir to the bulk storage reservoir has limited capacity and is unable to meet the peak summer demands.
- Low pressures are being experienced in Wentzel Park.
- 643 erven and 20 small holdings still required, access to a formal water supply in KwaNonqubeka.

**5.2 Sanitation**

- The adequacy of the wastewater system is not known.
- Sewer infrastructure is required for 643 households in KwaNonqubela and 80 erven in Phokoza valley.
- 20 households in KwaNonqubela require VIP's

**6. ONGOING PROJECTS**

- Investigation into the capacity of the oxidation pond

## 7. IDENTIFIED PROJECT

### 7.1 Water

excluding VAT

- In-line booster pumps for Wentzel Park : R 80 000
- 150 mm pumping main on bulk delivery system R 1 700 000
- 200 mm gravity main on bulk delivery system R 3 100 000
- Extension to main pump station on bulk delivery system R 950 000
- Reticulation to 643 erven in KwaNonqubela R 1 050 000
- Reticulation to 20 small holdings in KwaNonqubela R 100 000

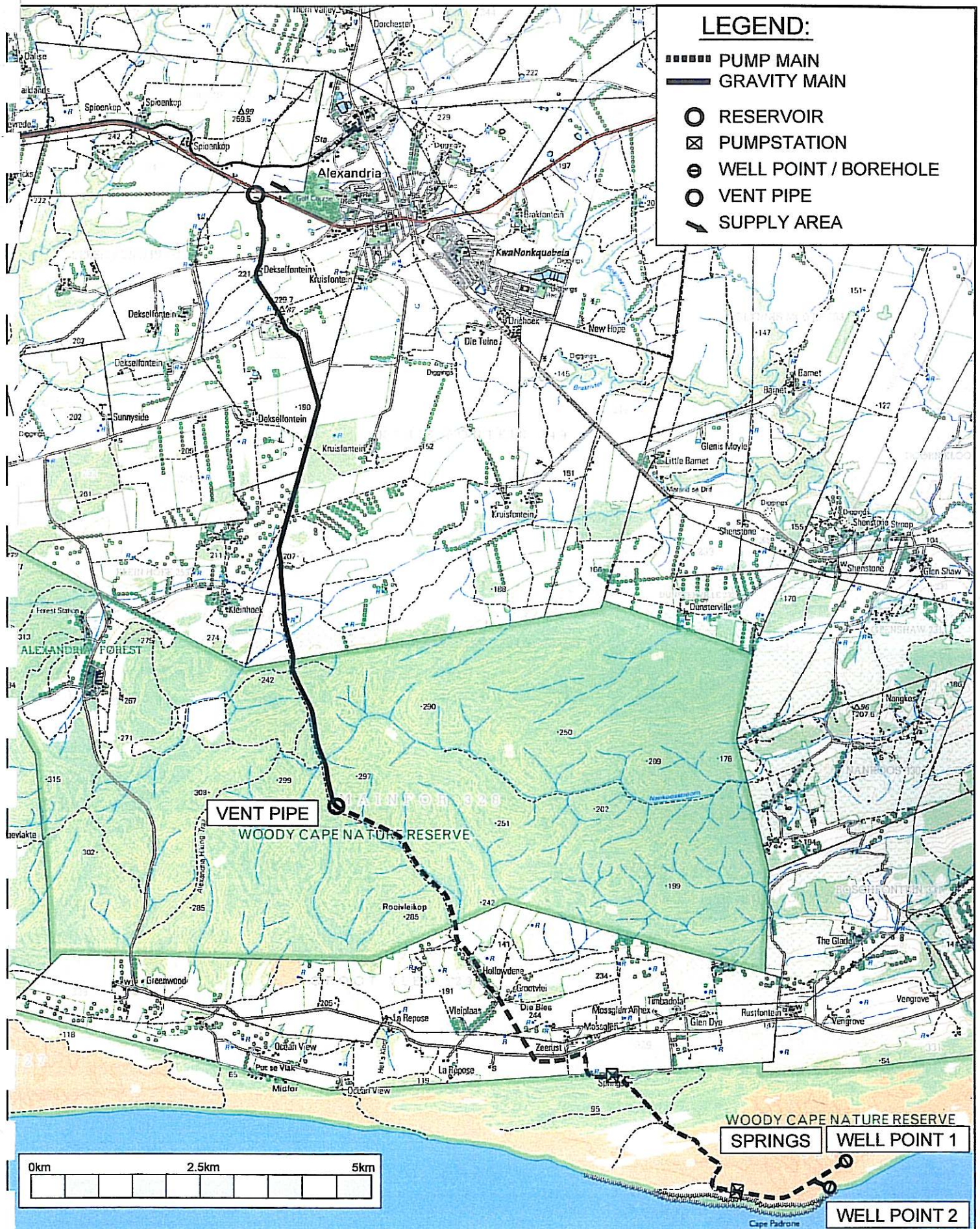
### 7.2 Sanitation

excluding VAT

- Upgrading of the oxidation pond system R 4 800 000
- Sewer infrastructure for Phokoza Valley R 560 000
- Sewer infrastructure for KwaNonqubela R 2 800 000
- VIP's for KwaNonqubela R 40 000

## 8. SOURCE OF INFORMATION

- Mr. G. Kruger Kwezi V3 Engineers (PE)
- Mr S. Fick P&S Consulting (Alexandria)
- Mr W. Patterson Ndlambe Municipality
- Eastern Cape Water Resources Situation Assessment
- DWAF National Database



**LEGEND:**

- ▬▬▬▬ PUMP MAIN
- ▬ GRAVITY MAIN
- RESERVOIR
- ⊠ PUMPSTATION
- ⊙ WELL POINT / BOREHOLE
- VENT PIPE
- SUPPLY AREA

VENT PIPE

WOODY CAPE NATURE RESERVE  
SPRINGS

WELL POINT 1

WELL POINT 2



Project  
**NDLAMBE MUNICIPALITY WATER SERVICE  
 SERVICE DEVELOPMENT PLAN**

Description  
**ALEXANDRIA LAYOUT**

Designed: W.S.K.
Sheet: 1 of 1
Drawn: W.K.
Scale: AS SHOWN
Checked: W.S.K.
No. 24526LW - 001

## CANNON ROCKS / BOKNES WATER SERVICES DATA SHEET

### 1. DESCRIPTION OF THE SUPPLY AREA

The supply area includes the coastal resorts of Cannon Rocks and Boknes. This area does fall within the area of jurisdiction of the Albany Coast Water Board, although they are currently not active in the area.

### 2. DESCRIPTION OF THE INFRASTRUCTURE

#### 2.1 Water

Water is obtained from 3No boreholes located to the west of Cannon Rocks and pumped through the linked reticulation network, to 2No. storage reservoirs.

#### 2.2 Sanitation

All households have septic tanks with soakaways.

### 3. DATA OF THE SUPPLY AREA

NO	Name	Household	Population	Level of service	Comment
1	Cannon Rocks		2950	<ul style="list-style-type: none"> <li>• 100% yard connection</li> <li>• 100% septic tanks</li> </ul>	
2	Boknes		923	<ul style="list-style-type: none"> <li>• 100% septic tanks</li> <li>• 100% yard connections</li> </ul>	
<b>Notes:</b> <ul style="list-style-type: none"> <li>• The IDP indicates a permanent population of 372 with an additional seasonal population of 2500</li> <li>• The DWAF National Database indicates a permanent population of 3873</li> </ul>					

## 4. DATA ON INFRASTRUCTURE

### 4.1 Water

Component	Capacity	Comment
3No boreholes Pumping main Reservoir	Q= 3-6l/s( $\pm 390\text{m}^3/\text{day}$ ) L= ?m H= ?m $\varnothing=?\text{mm}$	Poor water quality see note 2
Cannon Rock Reservoir	470 m <sup>3</sup>	48 hours of AADD
Boknes Reservoir	530m <sup>3</sup>	48 hours of AADD
<b>Notes:</b> <ul style="list-style-type: none"> <li>• 1No borehole is used out of season</li> <li>• <b>The water quality in the boreholes is unpalatable, apparently as a result of sea water intrusion due to over pumping.</b></li> <li>• AADD (current) : = 500 m<sup>3</sup>/day</li> <li>• Current peak demands = 1300 m<sup>3</sup>/day; PF = 2.6</li> <li>• AADD (2005) : = 435 m<sup>3</sup>/day (@ 100 l/c/day and DWAF population)</li> <li>• AADD (2010) : = 450 m<sup>3</sup>/day (as above)</li> <li>• Water is currently used primarily for gardening.</li> </ul>		

### 4.2 Sanitation

All households have owner built septic tanks with soakaways.

## 5. KEY ISSUES

### 5.1 Water

- The quality of the water is poor, apparently as a result of sea water intrusion due to over pumping.
- A new settlement of Stillwater, in the vicinity of Boknes is currently being planned.
- Water losses could be high as water is pumped thorough the reticulation networks to the storage reservoirs.

### 5.2 Sanitation

- Nil

## **6. ONGOING PROJECTS**

### **6.1 Water**

- Although there are currently no ongoing projects, attempts are being made to utilise CDM funds to augment the supply to the area from the Fishkraal boreholes, which are currently used to supply Alexandria

### **6.2 Sanitation**

- Nil.

## **7. IDENTIFIED PROJECTS**

### **7.1 Water**

- 2 possible alternative boreholes sites have been identified to augment supply to the area.

### **7.2 Sanitation**

- Nil

## **8. SOURCE OF INFORMATION**

- Mr S. Fick            P&S Consulting
- Mr R. Ball            Albany Coast Water Board
- Mr W. Patterson    Ndlambe Municipality
- Eastern Cape Water Resources Situation Assessment
- Western District Council WSDP

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## BUSHMANS RIVER / KENTON-ON-SEA WATER SUPPLY DATA SHEET

### 1. DESCRIPTION OF THE SUPPLY AREA

The supply area includes the towns of Kenton-on-Sea and Bushmans River Mouth and the former townships of Klipfontein, Marselle and Ekuphumleni.

### 2. DESCRIPTION OF THE INFRASTRUCTURE

#### 2.1 Water

Raw water is obtained from the following sources.

- 9No. boreholes near Dias Cross.
- 5No "fresh" water boreholes located near the Albany Coast Board offices.
- 8 No. sea water boreholes located near the mouth of the Bushmans River.

Water from the Dias Cross boreholes is pumped to a balancing reservoir from where it is pumped directly to the bulk supply reservoirs located at a high point behind Kenton-on-Sea (north of the R72).

Water from the other boreholes is pumped to plastic tanks near the Albany Coast Water Board Offices and then pumped through a reverse osmosis desalination plant before going into local storage. Brine from the desalination plant is returned to the sea via the Bushmans River, whilst the treated water is pumped to the bulk storage reservoirs.

Potable water from the bulk reservoirs is gravity fed directly to Kenton-on-Sea, eKuphumleni, Marselle, Klipfontein and a reservoir which feeds Bushmans River Mouth. A pumped supply system also feeds some farmers and a balancing reservoir to the north of Kenton-on-Sea.

It can be noted that most households in these areas augment their supplies with rainwater tanks.

See the layout schematic of the scheme end of the data sheets.

## 2.2 Sanitation

Both Kenton-on-Sea and Bushmans River Mouth have septic tanks and soakaways whilst Klipfontein, Marselle and eKuphumleni have waterborne sewer systems which drain to activated sludge wastewater treatment works in Bushmans River Mouth and Kenton-on-Sea respectively.

## 3. DATA ON THE SUPPLY AREA

NO	Name	Households	Population	Level of service	Comments
1	Bushmans River Mouth		3699	100% yard connections 100% septic tanks	
2	Klipfontein		713	100% yard connections 100% water borne sewer	
3	Marselle		2552	100% yard connections 100% water borne sewer	
4	Kenton-on-sea		6051	100% yard connections 100% septic tanks	
5	eKuphumleni		1689	100% yard connections 100% water borne sewer	
<b>Notes:</b>					
<ul style="list-style-type: none"> <li>Population figures from DWAF National database</li> </ul>					

## 4. INFRASTRUCTURE DATA

### 4.1 Water

Component	Capacity	Comments
Dias Cross boreholes and conveyance system	Q=75 m <sup>3</sup> /hour L= ? m ø= 200 PVC	Only licensed to abstract 300 000 m <sup>3</sup> /a (average of ±34 m <sup>3</sup> /hour)
Balancing reservoir	100 m <sup>3</sup>	1.3 hours storage at peak capacity
Pumping system to bulk storage reservoir	Q=75 m <sup>3</sup> /hour L= ± 9000m ø= 200 PVC	
Fresh boreholes	Q=28 m <sup>3</sup> /hour	
Sea water boreholes	Q=100 m <sup>3</sup> /hour	Total capacity from all 3 sources = 162 m <sup>3</sup> /hour

Component	Capacity	Comment
Plastic Tanks	7 x 15 = 95m <sup>3</sup>	0.75 hours of storage at peak capacity
Desalination Plant <ul style="list-style-type: none"> <li>• No.1</li> <li>• No 2</li> <li>• No3</li> </ul>	20m <sup>3</sup> /hour 20m <sup>3</sup> /hour 10m <sup>3</sup> /hour	Plant No1 is currently not functional. Only 50% of the capacity has been installed in plant No.3. The figures quoted are the final outputs. The desalination plants are ± 38% efficient.
Storage reservoir	100 m <sup>3</sup>	
Pumping system to bulk storage reservoir	Q=?m <sup>3</sup> /hour	
Bulk Reservoir	2 x 2MI	64 hours of AADD at current levels.
Bushmans reservoir	100m <sup>3</sup>	
Farmers pump system	Q=?m <sup>3</sup> /hour	
Farmers Reservoir	200 m <sup>3</sup>	
<b>Notes:</b>		
<ul style="list-style-type: none"> <li>• Current AADD = 1200 – 1500 m<sup>3</sup>/day (63m<sup>3</sup>/hour)</li> <li>• Current peak demand = 2800 m<sup>3</sup>/day (117m<sup>3</sup>/hour); PF = 1.86;</li> <li>• Current capacity of system = 125 m<sup>3</sup> / hour (when plant No. 1 is functional)</li> <li>• The annual average capacity of the system currently stands at 64m<sup>3</sup>/hour</li> <li>• AADD (2005) = 1960 m<sup>3</sup>/day</li> <li>• AADD (2005) = 3150 m<sup>3</sup>/day</li> <li>• Restrictions are often imposed on garden watering during peak seasons.</li> <li>• Growth is currently around 10% p.a.</li> </ul>		

## 4.2 Sanitation

Component	Capacity	Comments
Ekuphumleni WWTW	Q=? m <sup>3</sup> /day	
Klipfontein / Marselle WWTW	Q=? m <sup>3</sup> /day	
<b>Notes:</b>		

## 5. KEY ISSUES

### 5.1 Water

- The peak demands can only be sustained by pumping the Dias Cross boreholes beyond their permitted annual average abstraction rate.
- The water quality is sub-standard (class II –see typical analysis sheet attached).
- The bulk storage capacity is inadequate for the peak season.
- The Eskom supply is erratic, which further limits the supply capacity of the scheme.
- Desalinated water is expensive.

- The brine from the desalination plant is returned to the river, near the river mouth, which may have some negative environmental impact.

## 5.2 Sanitation

- Some septic tanks are overloaded during peak season resulting in some spillages.

## 6. ONGOING PROJECTS

### 6.1 Water

Upgrading of bulk infrastructure R3.2 million (CMIP), which includes:

- Refurbishing plant No1
- Augmentation of supply via run-of-river abstraction and filtration (100m<sup>3</sup>/hour).
- Upgrading desalination plant No.3 to its full capacity.
- Upgrading the brine disposal system.
- Upgrading the Eskom supply.

### 6.2 Sanitation

- Nil

## 7. IDENTIFIED PROJECTS

### 6.1 Water

- Upgrading the bulk storage capacity systems

### 6.2 Sanitation

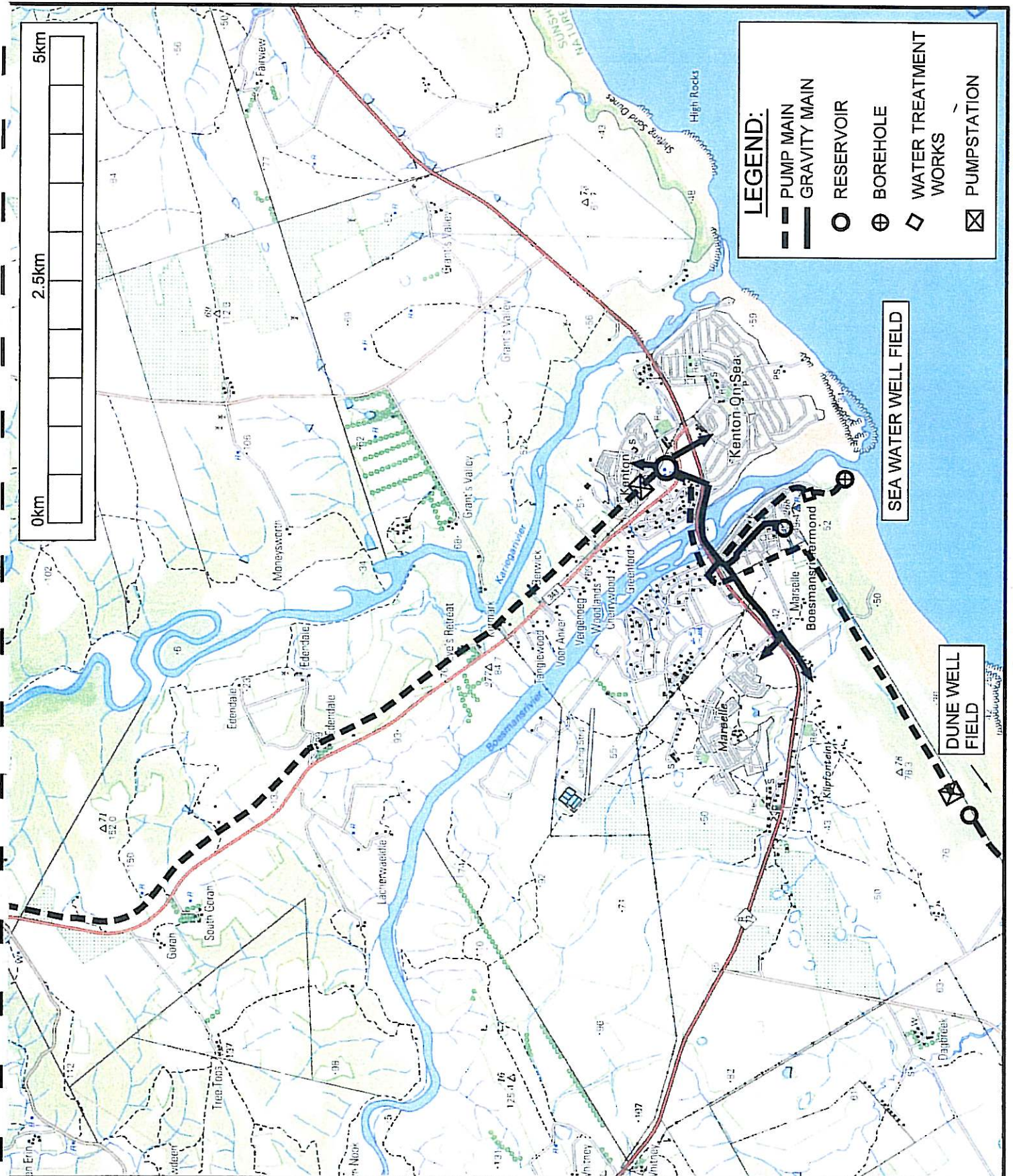
- Nil

## 8. SOURCE OF INFORMATION

Mr R Ball – Albany Coast Water Board

Mr W Patteson – Ndlambe Municipality

Eastern Cape Water Resources Situation Assessment



Project  
**NDLAMBE MUNICIPALITY WATER SERVICE  
 SERVICE DEVELOPMENT PLAN**

Description  
**KENTON ON SEA SCHEME LAYOUT**

Designed: W.S.K.
Sheet: 1 of 1
Drawn: W.K.
Scale: NTS
Checked: W.S.K.
No. 24526LW - 001



**CIVIL ENGINEERS, HYDROGEOLOGISTS &  
PROJECT MANAGERS (PTY) LTD**

**EASTERN CAPE**

7 River Road, Kenton-on-Sea, 6191  
P O Box 563, Kenton-on-Sea, 6191  
TEL / FAX: (046) 648-1181  
E-MAIL: [wsmec@mweb.co.za](mailto:wsmec@mweb.co.za)

27 February 2002

Mr. R. Ball  
Albany Coast Water Board  
P O Box 51  
BOESMANSRIVIERMOND  
6190

Dear Sir,

Herewith the analyses of water you requested.

ph 7,7	0	Class 0
Turbidity	10	Class II
TDS	1162	Class II
Electrical conductivity	210	Class II
<b>Calcium</b>	<b>289</b>	<b>Class III</b>
Chloride	553	Class II
Fluoride	<0,1	Class 0
Iron	0,09	Class 0
<b>Magnesium</b>	<b>161</b>	<b>Class III</b>
Manganese	0,06	Class I
Nitrate	0,5	Class 0
Potassium	11	Class 0
Sodium	300	Class II
Sulphate	78	Class 0

Class 0 = Ideal Quality  
Class I = Good Quality  
Class II = Safe Water  
Class III = Unacceptable Quality

**WHY CLASSIFY WATER?**

Water is classified to:

**OFFICES AT:** Pietersburg, Pretoria and Potgietersrus

Directors : A van Schalkwyk Pr Eng BSc. (Eng) C J Haupt Pr Sci. Nat BSc (Hons) P Mouton Pr Sci. Nat BSc (Hons)  
D J Truter Pr. Eng. BSc. Eng, MBL A M Janse van Vuuren B Eng Civils (Hons) MEng (Hydraulics)

## PORT ALFRED

### WATER SERVICES DATASHEET

#### 1. DESCRIPTION OF THE SUPPLY AREA

The supply area includes the town of the Port Alfred, the former townships of Nemato and Minosa Farm and the proposed township of Thornhill.

#### 2. DESCRIPTION OF THE INFRASTRUCTURE

##### 2.1 Water

Raw water is obtained from a weir on the Kowie River and pumped to an off channel storage dam (Sarel Haywood Dam) on the Bathurst stream. Water is then pumped from main linking the weir pumping system to the dam, to the sump of a third pump station, from where the water is pumped to a balancing dam near the hospital. From there the water is gravity fed to the water treatment works located to north of town in the vicinity of the school.

Potable water is then pumped from the bulk storage reservoir to 4No distribution reservoirs located on the East Bank, West Bank, Nemato township and a high level supply zone reservoir. Water is then reticulated by gravity to households.

Port Alfred also used to obtain water from the Mansfield Dam located to the south of Bathurst and from coastal sand dunes near the town. The dune system is still used during the peak seasons whilst the gravity main from the Mansfield is said to be broken in many places.

See the layout schematic of the scheme at the end of the datasheets.

##### 2.2 Sanitation

Parts of Port Alfred and parts of Nemato have waterborne sanitation, which drains into ponds treatment system, complete with an irrigation system, located on the banks of the Kowie River near, just upstream of Centenary Park.

The balance of Port Alfred has conservancy tanks whilst the balance of Nemato has pit latrines.

### 3. DATA ON THE SUPPLY SYSTEM

No	Name	Households	Population	Level of service	comments
1	Port Alfred	± 5000	7886	100% erf connections 40% water borne 60% conservancy tank	
2	Nemato	± 3500	12580	60% yard connection 20% communal standpipe; 20% water borne 50% digestive systems with French drains 50% VIP's	Phased upgrading of digestive system to a waterborne sewer system
3	Thornhill				Proposed development to cater for over crowding in Nemato
<b>Notes:</b>					
<ul style="list-style-type: none"> <li>Population figures from DWAF National database.</li> </ul>					

### 4. INFRASTRUCTURE DATA

#### 4.1 Water

Component	Capacity	Comments
Sarel Haywood Dam	Live storage = $1.5 \times 10^6 \text{ m}^3$ Yield = $1.5 \times 10^6 \text{ m}^3/\text{a}$	1:50 year yield (4.1 MI/day)
Mansfield Dam	Live storage = $0.2 \times 10^6 \text{ m}^3$	No longer used
Dune system	yield = $0.13 \times 10^6 \text{ m}^3/\text{a}$ (356 $\text{m}^3/\text{day}$ )	Used in peak season
Weir abstraction system (pump system No.1)	Q=12 960 $\text{m}^3/\text{day}$ (150 l/s) L= 700 m Ø= 350 mm	Cannot abstract from the weir if the water level reaches 1.0 m below the crest of the weir
Pump system No 1	Q=4320 $\text{m}^3/\text{day}$ (50l/s) L= 4200 m Ø= 300 mm	
Pump system No 2	Q=4320 $\text{m}^3/\text{day}$ (50l/s) L= 6800 m Ø= 250 mm	
Balancing Dam	?	± 8 days of AADD at current levels
Gravity system		Capacity recently upgraded
Water treatment works	5 MI/day	Recently upgraded
Bulk reservoir	2 MI	± 24 hours AADD at current demands

Distribution reservoirs		
West Bank	2.8 MI	
East Bank	0.8 MI	
Nemato	1.0 MI	
<b>Notes:</b>		
<ul style="list-style-type: none"> <li>• AADD (current) = 1.8 - 2.0 MI/day</li> <li>• Current peak demand = 5 MI/day</li> <li>• Current capacity of system = 4.3 MI/day</li> <li>• AADD = (2005) = 2.3 MI/day</li> <li>• AADD = (2010) = 2.4 MI/day</li> </ul>		

## 4.2 Sanitation

Component	Capacity	Comments
Ponds system	1.8 MI/day	Average inflows = $\pm$ 94% of wwtw capacity. Peak inflows = $\pm$ 236% of wwtw capacity
<b>Notes:</b>		
<ol style="list-style-type: none"> <li>1. The original design of the wwtw never catered for Nemato</li> <li>2. The capacity of the ponds are exceeded during the summer peaks and spillage into the Kowie River probably occur</li> </ol>		

## 5. KEY ISSUES

### 5.1 Water

- The reliability (assurance of supply) of the raw water supply is questionable.
- The raw water quality is poor (high saline content) due to the marine origins of the soils underlying the dam basin. See potable water analysis sheet attached.
- The capacity of the bulk supply system needs to be upgraded to meet the peak seasonal demands.
- Bulk water supply infrastructure is required to support the proposed Thornhill development.
- Not all households in Nemato have access to yard connections.

### 5.2 Sanitation

- The existing oxidation ponds are inadequate to meet the current demands,
- Bulk infrastructure is required to support the proposed Thornhill development.
- Some households in Nemato do not have access to even a basic level of service.
- Not all households have access to the water borne sewer system.

## **6. ONGOING PROJECTS**

### **6.1 Water**

- Refurbishment of the water treatment work and gravity conveyance system R2.0 million (CMIP).

### **6.2 Sanitation**

- None

## **7. IDENTIFIED PROJECTS**

The following projects are recommended.

### **7.1 Water**

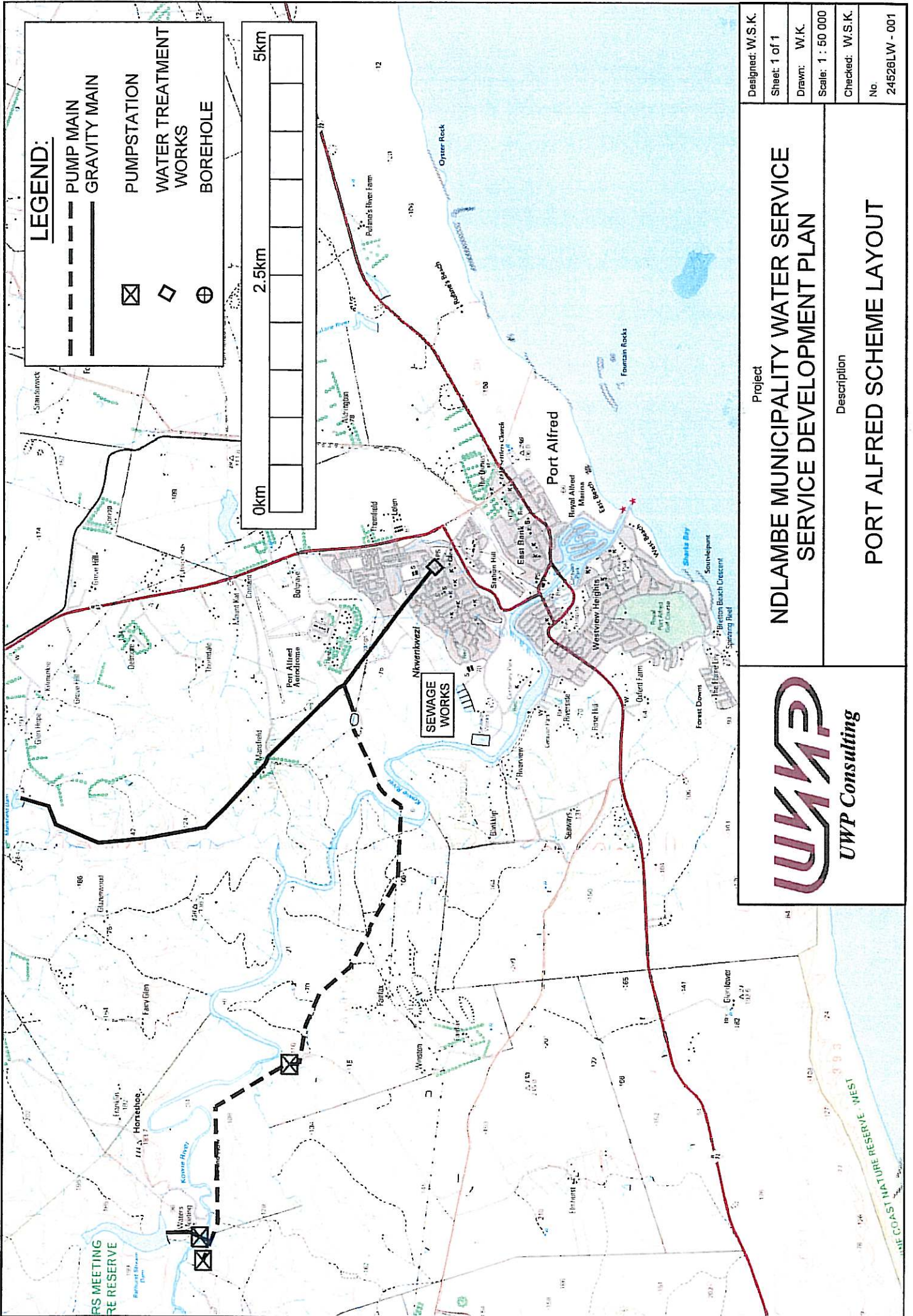
- A water resources study of the area with a view to improving the assurance and quality of supply to the Ndlambe area in general and Port Alfred in particular.
- Upgrading of the bulk supply infrastructure.
- Provision of bulk water services to Thornhill and Nemato.

### **7.2 Sanitation**

- Investigation and possible upgrading of the wastewater treatment works.
- Investigation with regard the use of partly treated sewerage to irrigate the golf course.
- Provision of services to Thornhill and sewers to the remaining portions of Port Alfred and Nemato.

## **8. SOURCE OF INFORMATION**

- Mr. W Patterson – Ndlambe Municipality
- Eastern Cape Water Resources Situation Assessment
- Operating and Maintenance Manual for the Safety of the Sarel Hayward Dam.



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## **KLEINENONDE /SEAFIELD WATER SERVICES SUPPLY SHEET**

### **1. DESCRIPTION OF THE SUPPLY SHEET**

The supply area includes East Kleinemonde and Seafield. West Kleinemonde is a share block and the owners are responsible for their own services provision.

### **2. DESCRIPTION OF THE INFRASTRUCTURE**

#### **2.1 Water**

Water is obtained from Wellington Dam (a farm dam) located some 8 km north west of the town and from 2No. coastal boreholes located in the Seafield area. The boreholes are generally used as a standby capacity and during peak seasons.

Raw water is pumped from Wellington Dam, via a balancing reservoir, to a water treatment works located on East Kleinemonde peninsula, where it is treated and pumped to a storage reservoir in Seafield. Water is also pumped from the works directly into the Peninsula and South Island reticulation networks, which are connected to the pumping main to the Seafield reservoir.

The Seafield Reservoir gravity feeds a portion of Seafield and a lower laying storage reservoir, which in turn gravity feeds a supply zone within Seafield.

The borehole located to the east of Seafield supplies the Seafield reservoir whilst the borehole near the East Kleinemonde River mouth, supplies the lower zone reservoir.

See the layout schematic of the scheme at the end of the data sheets.

#### **2.2 Sanitation**

All households have septic tanks with soakaways.

### 3. DATA ON THE SUPPLY AREA

NO	Name	Households	Population	Level of Service	Comments
1	East Kleinemonde Seafield	600	1477	50% yard connection 50% septic tanks	± 300 erf are developed ± 200 households are permanently occupied
<b>Notes:</b> <ul style="list-style-type: none"> <li>Population figure from DWAF National database.</li> <li>Household figures from NLM</li> </ul>					

### 4. INFRASTRUCTURE COMPONENTS

#### 4.1 Water

Component	Capacity	Comments
Wellington Dam	?	Yield of the dam has not been ascertained.
Wellington pump station and pumping main	Q=360 m <sup>3</sup> /day L= ± 2000m Ø= 75 mm uPVC h= ?m	
Balancing reservoir	40 m <sup>3</sup>	5 hours of AADD at current development
Gravity main	L=± 6000 m Ø= 75mm uPVC	
Water treatment works	360 m <sup>3</sup> /day	
Pump station and pump main	Q=m <sup>3</sup> /day L= ? m Ø= 75 mm U PVC h= ?m	Capacity is said to be adequate.
Reservoir	800 m <sup>3</sup>	± 106 hours AADD at current development
Seafield borehole	100 m <sup>3</sup> /day	
River mouth borehole	50 m <sup>3</sup> /day	
Zone reservoir	60 m <sup>3</sup>	
<b>Notes:</b> <ul style="list-style-type: none"> <li>Winter demand 60 – 100 m<sup>3</sup>/day</li> <li>Summer demands 100 – 150 m<sup>3</sup>/day</li> <li>December demand 360 m<sup>3</sup>/day; PF= 3.6</li> <li>Current capacity of system = 510 m<sup>3</sup>/day</li> <li>AADD (2005) @2%p.a = 285 m<sup>3</sup>/day</li> <li>AADD (2010) @2%p.a = 315 m<sup>3</sup>/day</li> <li>Development of the area is happening fast.</li> <li>System appears to be adequate to 2010</li> </ul>		

## 4.2 Sanitation

All households have owner built septic and soakaways. A tanker service is provided by Ndlambe Municipality if required.

## 5. KEY ISSUES

### 5.1 Water

- The reliability of the yield from Wellington dam is not known.
- The frequent Eskom power outages negatively impact on the continuity of supply.
- Bulk and reticulation systems are interconnected (high possibility of water losses/unaccounted for water).
- Telemetry control system negatively impacts on the operational efficiency of the system.
- Water quality issues were not confirmed.

### 5.2 Sanitation

- Poorly constructed soakaways result in sewerage spillage into the river during peak holiday season.

## 6. ONGOING PROJECTS

### 6.1 Water

- Nil

### 6.2 Sanitation

- Nil

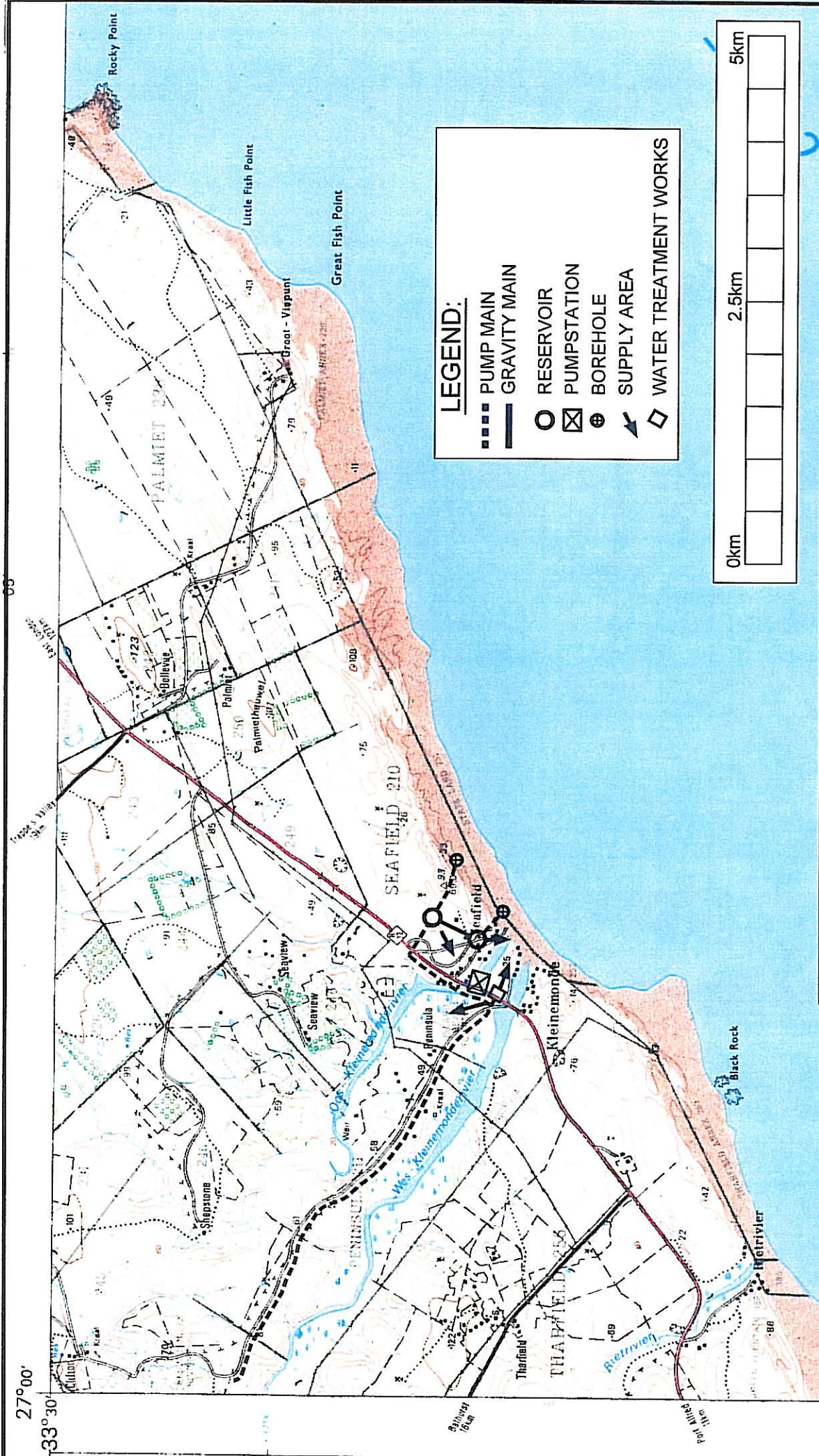
## 7. IDENTIFIED PROJECTS

No projects have been identified for this area but the following are recommended:

- Assessment of the reliability of the scheme is general and the dam in particular, taking cognisance of the current growth rate.
- Installation of a dedicated bulk supply system and the upgrading of the reticulation network to ensure an equitable supply through Kleinemonde.
- Review and possible upgrade of the control system
- Establishment of design standards for septic tanks and soakaways

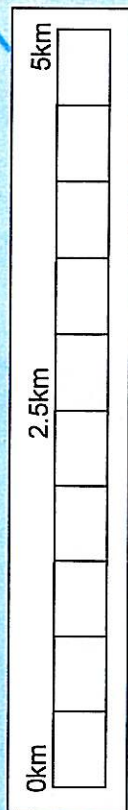
## 8. SOURCE OF INFORMATION

- Mr Lionel Wilson – Ndlambe Municipality



**LEGEND:**

- PUMP MAIN
- GRAVITY MAIN
- RESERVOIR
- ⊠ PUMPSTATION
- ⊕ BOREHOLE
- ↙ SUPPLY AREA
- ◇ WATER TREATMENT WORKS



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Project	<b>NDLAMBE MUNICIPALITY WATER SERVICE SERVICE DEVELOPMENT PLAN</b>
Description	
<b>KLEINEMONDE / SEAFIELD SCHEME LAYOUT</b>	



## BATHURST

### WATER SERVICES DATA SHEET

#### 1. DESCRIPTION OF THE SUPPLY AREA

The supply area includes the town of Bathurst and the former townships of Nolukhanyo and Freestone.

#### 2. DESCRIPTION OF THE INFRASTRUCTURE

##### 2.1 Water

The town of Bathurst is dependent on private supplies (boreholes) and rainwater tanks, whilst Nolukhanyo and Freestone are supplied from the Goldenridge Dam. The area used to be supplied with water from the Mansfield Dam, but it ran dry some years ago, necessitating an alternate supply. Raw water is pumped from the dam to a package treatment within the town from where potable water is pumped to the Toposcope reservoir. The reservoir then gravity feeds the respective reticulation networks.

##### 2.2 Sanitation

Bathurst is serviced by a mixture of septic and conservancy tanks whilst Nolukhanyo and Freestone are service with septic tanks and soakaways.

#### 3. DATA ON THE SUPPLY AREA

No	Name	Households	Population	Level of Service	Comment
1	Bathurst		5000	100% yard connections 100% septic tanks	
2	Nolukhanyo		3832	100% yard connections 100% septic tanks	
3	Freestone		1808	100% yard connections 100% septic tanks	
<b>Notes:</b>					
<ul style="list-style-type: none"> <li>Population figures from the DWAF National Database</li> </ul>					

## 4. INFRASTRUCTURE COMPONENTS

### 4.1 Water

Component	Capacity	Comments
Goldenridge Dam		Yield of the dam has not been ascertained
Pump stations pumping main	Q=16l/s (1382m <sup>3</sup> /day) L=8000m Ø=200pVC H=?m	
Mansfield Dam	Live storage = 0.2x10 <sup>6</sup> m <sup>3</sup>	Yield of the Dam has not been ascertained
Pump station and pumping main	Q=5l/s	
Water treatment works	Q= 18m <sup>3</sup> /hour (432 M <sup>3</sup> /day)	Plant has been designed to be progressively upgraded to 28m <sup>3</sup> /hour and 42m <sup>3</sup> /hour.
Potable water pump station and pumping main	Q= ?l/s L=1300m Ø=110mm uPVC H static= m	
Toposcope Reservoir	1.0 MI	
<b>Notes:</b>		
<ul style="list-style-type: none"> <li>• AADD current = ? m<sup>3</sup>/day</li> <li>• AADD (2005) = 630 m<sup>3</sup>/day (1295m<sup>3</sup>/day if the whole of Bathurst is serviced)</li> <li>• AADD (2010) = 665 m<sup>3</sup>/day (1255m<sup>3</sup>/day if the whole of Bathurst is serviced)</li> </ul>		

### 4.2 Sanitation

Conservancy and septic tanks

## 5 KEY ISSUES

- The scheme does not service the entire area.
- The treatment work is near or at capacity.
- Inadequate bulk storage
- The Mansfield Dam is no longer in use

## 6 ONGOING PROJECTS

### 6.1 Water

- Nil

**6.2 Sanitation**

- Nil

**7 IDENTIFIED PROJECTS**

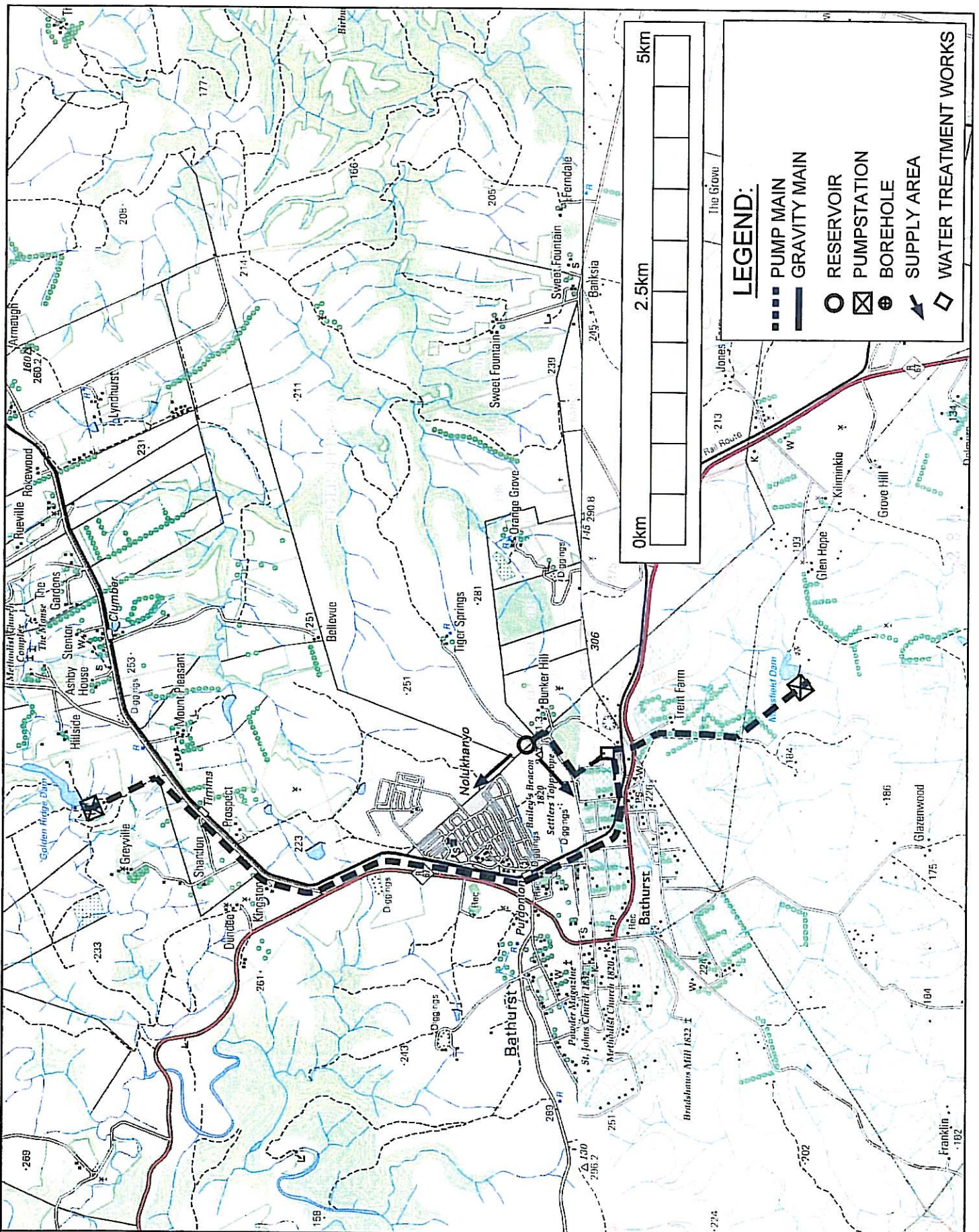
- Upgrading of the water treatment works and command reservoir.
- Investigation regarding the adequacy of the scheme to feed the entire town including the possible re-commissioning of the supply from the Mansfield Dam.
- Investigation into the adequacy of the sanitation facilities.

**8 SOURCE OF INFORMATION**

Mr J. Nel – Africon (PE)

Mr W Patterson – Ndlambe Municipality

Eastern Cape Water Resources Situation Assessment



Project  
**NDLAMBE MUNICIPALITY WATER SERVICE  
 SERVICE DEVELOPMENT PLAN**

Description  
**BATHURST LAYOUT**

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## HOLIDAY RESORTS AND RURAL SETTLEMENTS WATER SERVICES DATASHEETS

### Holiday Resorts

The settlements of Kasuku and Fish River Mouth are holiday resorts and it is reported that they have access to a level of service above RDP standards.

### Rural Settlements

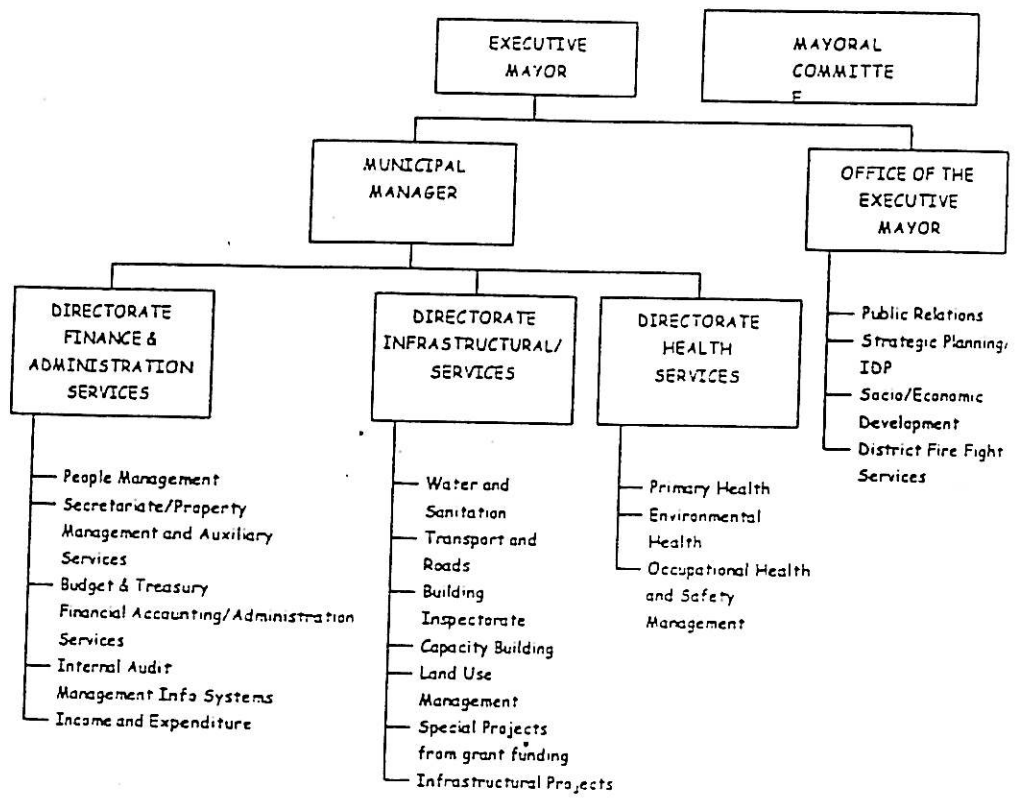
These settlements are predominantly located on privately owned farmlands to the east of Ndlambe on the banks of the Fish River.

The following settlements are reported to have access to services below RDP standards

- Glassmere (± 60 people) = have access to sub-RDP services (groundwater)
- Wilmington (±90 people)= have access to sub-RDP services (groundwater)
- Gross Roads (± 20 people) = have access to sub-RDP services (groundwater)
- Tappes Valley (± 4 people) = rain water tanks

**ANNEXURE D**  
**ORGANOGRAM OF THE NDLAMBE MUNICIPALITY**

**ANNEXURE E**  
**ORGANOGRAM OF THE CACADU MUNICIPALITY**



**ANNEXURE F**  
**2002/2003 REVENUE BUDGETS**

TOWN ENGINEER(WATER) ADMINISTRATION		BUDGET 2001/2002	ACTUAL MAR 2002	BUDGET 2002/2003
SALARIES & WAGES	15-20-55			
Salaries	6000	230,788	215,812	483,100
Salaries overtime	6010	31,100	22,884	25,400
Allowance	6020	26,030	8,306	400
Housing	6030	15,792	6,609	4,800
Group life	6060	4,400	1,435	11,200
Medical	6070	40,888	17,352	29,700
Pension	6080	36,272	35,204	65,300
Uif	6100	1,971	1,897	4,500
Uniforms	6110	2,143	14,288	4,100
		389,384	323,787	628,500
GENERAL EXPENSES	15-20-55			
Administration	6200	190,200	111,150	148,200
Advertising	6210	706		700
Chemicals	6330	1,000	8,917	
Consultant/Management Fees TGIS	6340	88,800	85,274	120,000
Electricity	6400	39,000	30,128	40,000
Fuel	6430	43,068	47,995	51,000
Insurance general	6440	20,500		20,500
Oil/grease	6510	4,500	1,357	4,500
Print/stationery	6560	750		500
Quary/material	6610	16,700		16,700
Rental/office	6655	6,000		6,000
Sanitation fees	6700	366		400
Security	6710	2,000	12,299	16,000
Stores/material	6740	27,635	8,005	7,000
Subsistance & travelling	6780	1,000		1,000
Tea	6810	66		200
Telephone	6820	24,000		24,000
Test/specimen	6830	400	210	400
Transport	6880	12,338	4,145	10,000
Water	6910	1,984		1,500
Water/research	6920	26,000	17,309	25,000
		507,013	326,789	493,600
REPAIRS & MAINTENANCE	15-20-55			
Building	7020	29,410	140	10,000
Spares	7080	9,200	4,240	8,000
Tools equipment	7090	53,790	4,569	45,000
Tyres/tubes	7100	9,800	4,329	7,000
		102,200	13,278	70,000
CAPITAL CHARGES	15-20-55			
Interest	7200	7,771	11,924	15,700
Redemption	7210	31,335	10,570	51,400
		39,106	22,494	67,100
CONTRIBUTIONS TO CAPITAL OUTLA	15-20-55			
Small/capital	7260	17,676		10,000
		17,676		10,000
CONTRIBUTIONS TO FUNDS	15-20-55			
Provision for Maintenance	6693	83,800		85,000
		83,800		85,000
Total Expenditure		1,139,179	686,348	1,354,200 ✓









TOWN ENGINEER(WATER) PURIFICATION		BUDGET 2001/2002	ACTUAL MAR 2002	BUDGET 2002/2003
<b>SALARIES &amp; WAGES</b>	15-20-59			
Salaries	6000	32,100	30,996	99,900
Salaries overtime	6010		8,074	
Allowance	6020	1,300	1,467	2,600
Wages	6040	92,500	45,696	
Wages overtime	6050	18,000	4,957	
Pension	6080	13,800	7,754	11,100
Uif	6100	1,200	640	1,000
Uniforms	6110	2,200		1,600
		161,100	99,584	116,200
<b>GENERAL EXPENSES</b>	15-20-59			
Chemicals	6330	6,500	677	26,500
Electricity	6400	26,000	18,775	26,000
Stores/material	6740	15,000	44,714	30,000
		47,500	64,166	82,500
<b>REPAIRS &amp; MAINTENANCE</b>	15-20-59			
Building	7020	500		500
Tools equipment	7090	2,500	160	1,500
		3,000	160	2,000
<b>CAPITAL CHARGES</b>	15-20-59			
Interest	7200	7,000		7,000
Redemption	7210	35,800		35,800
		42,800		42,800
<b>CONTRIBUTIONS TO CAPITAL OUTLA</b>	15-20-59			
Small/capital	7260	6,000		
		6,000		
<b>Total Expenditure</b>		260,400	163,910	243,500
<b>INCOME</b>	15-20-59			
<b>Total Income</b>				
<b>Total Department</b>		(260,400)	(163,910)	(243,500)

TOWN ENGINEER(WATER) RETICULATION		BUDGET 2001/2002	ACTUAL MAR 2002	BUDGET 2002/2003
<b>SALARIES &amp; WAGES</b>	15-20-61			
Salaries	6000	569,294	445,435	1,183,000
Salaries overtime	6010	30,770	25,122	45,900
Bonus	6015	2,571	1,938	
Allowance	6020	10,100	15,616	2,300
Housing	6030	13,920	6,167	6,000
Transport	6035	84,925	63,788	
Wages	6040	235,939	170,958	
		3,850	2,657	
Wages overtime	6050	9,841	25,943	
Group life	6060	24,307	18,006	37,100
Medical	6070	24,027	24,253	63,400
Pension	6080	64,974	52,073	173,700
Uif	6100	7,058	3,494	11,100
Uniforms	6110	10,884	622	14,500
		1,092,460	856,072	1,537,000
<b>GENERAL EXPENSES</b>	15-20-61			
Advertising	6210	3,000		
Chemicals	6330	12,500	5,183	
Electricity	6400	211,526	161,859	212,000
Fuel	6430	23,574	10,159	20,000
Licences vehicles	6490	202	178	200
Print/stationery	6560	12,206	3,997	1,000
Sanitation fees	6700	375		400
Stores/material	6740	168,969	35,746	170,000
Subsistance & travelling	6780	1,500		1,000
Tea	6810	254		200
Transport	6880	1,654		1,700
Water	6910	2,080,661	1,343,786	2,080,700
		2,516,421	1,560,908	2,487,200
<b>REPAIRS &amp; MAINTENANCE</b>	15-20-61			
Building	7020	900		500
Spares	7080	2,340	2,065	2,500
Tools equipment	7090	65,111	21,525	55,000
		68,351	23,590	58,000
<b>CAPITAL CHARGES</b>	15-20-61			
Interest	7200	427,463	5,468	410,600
Redemption	7210	349,287	16,646	448,600
		776,750	22,114	859,200
<b>CONTRIBUTIONS TO CAPITAL OUTLA</b>	15-20-61			
Small/capital	7260	8,010	5,797	8,000
		8,010	5,797	8,000
<b>Total Expenditure</b>		4,461,992	2,468,481	4,949,400
<b>INCOME</b>	15-20-61			
Administration	5000	1,050		
Service Charges	5175/006	4,200		
Interest Accounts	5185	3,000		
Subsidy Loan Contra	5355	279,400		279,400
Sundry Income	5370	120	313	
<b>Total Income</b>		287,770	313	279,400
<b>Total Department</b>		(4,174,222)	(2,468,168)	(4,670,000)







**ANNEXURE G**  
**EXISTING TARIFFS**

<b>COMBINED TARIFF STRUCTURE - NDLAMBE MUNICIPALITY</b>		
DESCRIPTION	2002 / 2003	2001 / 2002
60 amps	277.43	260.50
Cost per unit: SCALE 1 (rateable prop.)		
HOUSEHOLD	R 0.248 Kwh	R 0.233 Kwh
COMMERCIAL	R 0.248 Kwh	R 0.233 Kwh
Availability on vacant sites:		
HOUSEHOLD: New Services	183.02	171.85
Monthly	15.25	14.32
Connection Fee	483.17	453.68
Minimum charge	63.81	59.92
Increase in ampage	35.93	33.74
<b>BULK SUPPLY:</b>		
Minimum Charge	398.84	374.50
Deposit	3,813.48	3,813.48
Minimum charge: 40-100 KVA	184.98	173.69
KVA	19.98	18.76
Kwh	R 0.248	R 0.233
Electricity: Connection Fee 1-phase	102.56	96.30
3-phase	139.60	131.08
BUSINESS: Connection Fee 1-phase	139.60	131.08
<b>CHICORY SA LTD:</b>		
Min KVA 525-Max KVA 750	45.84	43.04
Penalty when exceeded on KVA		2.43
Minimum/ea. KVA consumed	2.59	43.44
KVA	46.26	
Kwh	R 0.167	R 0.1571
<b>INDUSTRIAL</b>		
Connection Fee	139.37	130.86
Minimum Charge	582.77	547.20
Deposit	1,712.00	1,712.00
<b>STREETLIGHTS</b>		
Per Streetlight	19.40	18.22
<b>Electricity meter cards:</b>		
20 units	8.10	7.61
50 units	20.25	19.01
60 units	40.50	38.03
100 units		
<b>WATER</b>		
Monthly minimum charges per meter	23.04	
Monthly minimum charges vacant erven	23.04	
Monthly Standpipes	18.00	
Consumption:		
Per KL: 0-10 KL	2.80	
11-20 KL	3.00	
21+	3.30	
Sporting Bodies/Agreements per KL	2.00	
New Connection	730.00	
Water supply by tanker	280.00	
Plus Water as per tariff		
<b>WATER &amp; ELECTRICITY CONNECTIONS / DISCONNECTIONS</b>		
Special reading	45.00	
Disconnection (normal)	45.00	
Connection (of existing)	45.00	
Disconnection (non-payment)	85.00	
Reconnection (non-payment)	85.00	
After hours	Double above	

**ANNEXURE H**  
**PRIORITISED PROJECTS LIST**

**NDLAMBE MUNICIPALITY  
WATER SERVICES DEVELOPMENT PLAN**

**PRIORITISED PROJECT LIST**

Ranking	Project Description	Water / Sanitation	Programme	Ward	Total cost ( R )	Probable Source of Funding	Comments
1	Pipeline – Fish Kraals to Cannon Rocks	W	Expansion, Refurbishment & Upgrading	2	R 2,000,000	CDM	May get funding from Cacadu DM within the next few weeks
1	Provision of the following services to support the Thornhill housing development		Expansion, Refurbishment & Upgrading	6		CMIP	Needs as far as possible to be implemented collectively. Phasing will however be investigated
	Water purification plant	W			R 5,000,000		
	3 Ml reservoir	W			R 3,800,000		
	Main water line	W			R 260,000		
	Main sewer line	S			R 3,300,000		
	Upgrading of sewer works	S	R 9,500,000				
1	Water Demand Management Intervention	W	Water Management	1	R 500,000	DWAF	
1	Water meters, Kwanonqubela, Alexandria	W	Water Management	1	R 1,000,000	DWAF/CMIP/ NLM	In support of Water Demand Intervention
1	Water meters, Marselle, Bushmans-river mouth	W	Water Management	3	R 150,000	DWAF/CMIP/ NLM	In support of Water Demand Intervention
1	Water meters, Ekuphumleni, Kenton on Sea	W	Water Management	4	R 150,000	DWAF/CMIP/ NLM	In support of Water Demand Intervention
1	Water meters, Marselle, Bushmans-river mouth	W	Water Management	4	R 150,000	DWAF/CMIP/ NLM	In support of Water Demand Intervention
1	Water meters, Ekuphumleni, Kenton on Sea	W	Water Management	4	R 150,000	DWAF/CMIP/ NLM	In support of Water Demand Intervention
1	VIP's for KwaNoqubela	S	Basic needs		R 50,000	DWAF/CMIP/ NLM	
<b>Sub-total</b>					<b>R 26,010,000</b>		
2	Upgrade bulk conveyance system to Alexandria	W	Expansion, Refurbishment & Upgrading		R 6,555,000	CMIP	Phasing can be considered
2	Upgrade Alexandria Oxidation Pond	S	Expansion, Refurbishment & Upgrading	2	R 5,472,000	CMIP	
2	Seafield Bulk Supply	W	Expansion, Refurbishment & Upgrading	6	R 150,000	CMIP/NLM	
2	Sewerage pumpstaion, Bushmans River	S	Expansion, Refurbishment & Upgrading	3	R 1,500,000	CMIP	
2	Bulk sewer system, Kenton-on-Sea	S	Expansion, Refurbishment & Upgrading	4	R 700,000	CMIP/NLM	
2	Phase 4 Dry sewer system, Bathurst	S	Basic needs	5	R 1,200,000	DWAF/CMIP/NLM	
<b>Sub-total</b>					<b>R 15,577,000</b>		
3	Bulk Storage to Kenton on Sea	W	Expansion, Refurbishment & Upgrading		R 1,300,000	CMIP/NLM	
3	Filtration plant, Bathurst	W	Expansion, Refurbishment & Upgrading	5	R 200,000	CMIP/NLM	
3	Water reticulation to KwaNoqubela	W	Expansion, Refurbishment & Upgrading		R 1,350,000	CMIP/NLM	Upgrade bulk infrastructure first
3	Sewer reticulation, Kwanongubela	S	Expansion, Refurbishment & Upgrading	1	R 3,200,000	CMIP	Upgrade bulk infrastructure first
3	Pumpstation Wentzel Park	W	Expansion, Refurbishment & Upgrading		R 100,000	CMIP/NLM	
3	Extension of sewerage reticulation Ekuphumleni	S	Expansion, Refurbishment & Upgrading	4	R 1,500,000	CMIP/NLM	Upgrade bulk infrastructure first
3	Small bore sanitation system Bathurst	S	Expansion, Refurbishment & Upgrading	5	R 3,200,000	CMIP	Upgrade filtration plant first
3	Sewers for Phokoza Valley	S	Expansion, Refurbishment & Upgrading		R 650,000	CMIP/NLM	Upgrade water conveyance first
<b>Sub-total</b>					<b>R 11,500,000</b>		
4	Repair water pipes and Stormwater, Wentzel Park	W	Expansion, Refurbishment & Upgrading	2	R 500,000	CMIP/NLM	
4	Water reticulation, Bathurst	W	Expansion, Refurbishment & Upgrading	5	R 1,500,000	CMIP/NLM	Upgrade filtration plant first
<b>Sub-total</b>					<b>R 2,000,000</b>		
<b>Total</b>					<b>R 55,087,000</b>		

**NDLAMBE MUNICIPALITY  
WATER SERVICES DEVELOPMENT PLAN**

**PRIORITISED PROJECT LIST**

**Totals per Category**

*Service*

Water

R 24,815,000

Sanitation

R 30,272,000

R 55,087,000

*Programme*

Water Management

R 2,100,000

Expansion, Refurbishment & Upgrading

R 51,737,000

Basic needs

R 1,250,000

R 55,087,000

*Probable Funder*

Dwaf

R 500,000

Dwaf/CMIP/NLM

R 2,850,000

CMIP/NLM

R 7,950,000

CMIP

R 41,787,000

CDM

R 2,000,000

R 55,087,000

**ANNEXURE I**  
**RECORD OF WORKSHOP**

