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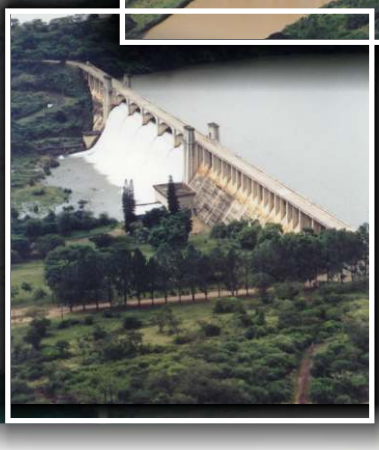
Water Reconciliation Strategy Study for the Kwazulu Natal Coastal Metropolitan Areas

First Stage Strategy: Water Conservation & Demand Management











JANUARY 2009

SUBMITTED BY:

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WATER RECONCILIATION STRATEGY STUDY FOR THE KWAZULU-NATAL COASTAL METROPOLITAN AREAS

FIRST STAGE STRATEGY:

WATER CONSERVATION & DEMAND MANAGEMENT

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Prepared by:

WRP Consulting Engineers

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Executive Summary

Introduction

The bulk water supply system of the KwaZulu-Natal coastal metropolitan area consists of an extensive network of water conveyance and treatment infrastructure (pipelines and aqueducts) transferring water from the main storage reservoirs, Midmar, Albert Falls, Nagle and Inanda Dams in the Mgeni River System and Hazelmere Dam on the Mdloti River to the water users. Furthermore, the Mooi-Mgeni Transfer Scheme augments the supply of the upper Mgeni River (Midmar Dam) and in the far north of the study area KwaDukuza (Stanger), in the iLembe DM, receives water from the Mvoti River.

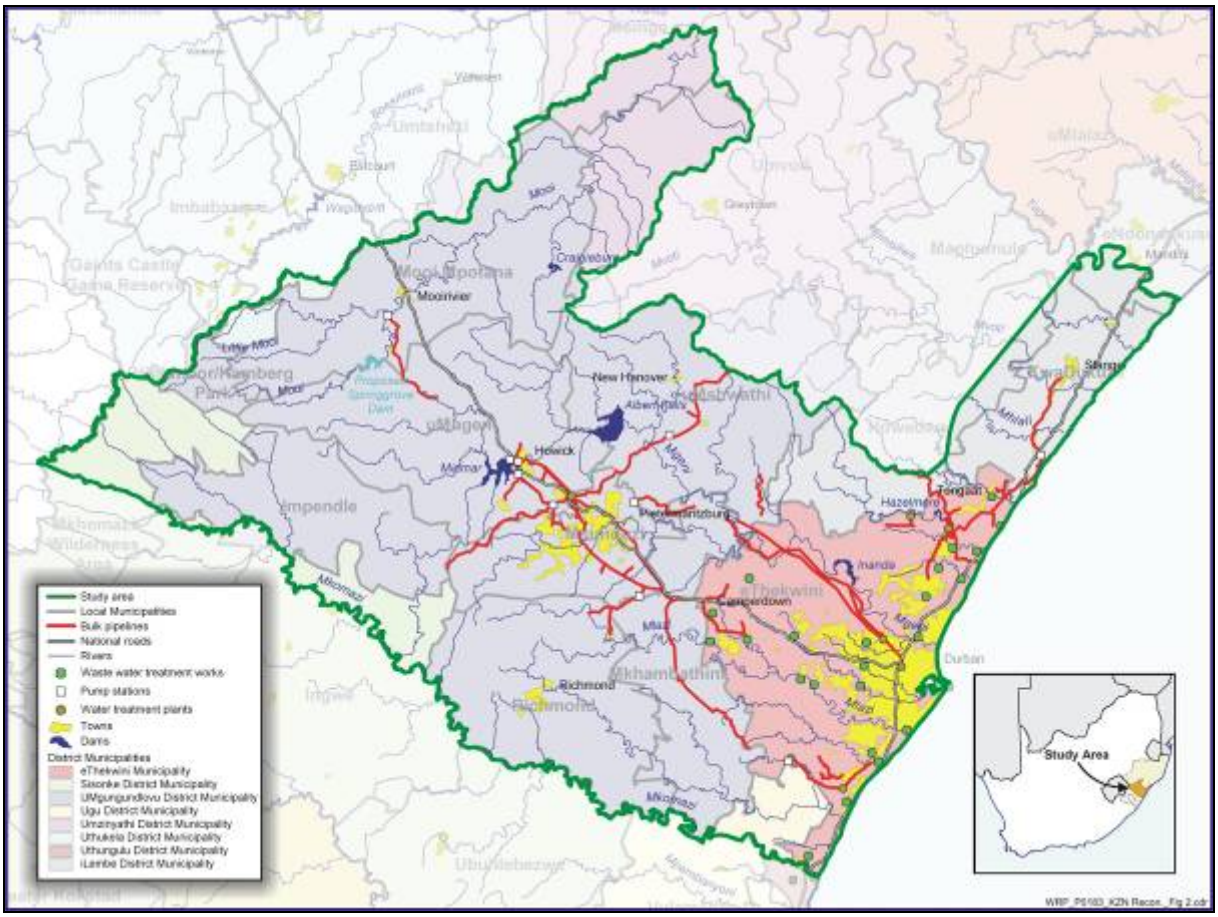


Figure 1.1: Study Area

The study team focused on the large city centres and key demand centres as these centres hold the greatest potential for water savings. This does not mean that the smaller areas should not

undertake WC/WDM, but potential water savings in these areas are negligible compared with the greater supply area. The following municipalities were the focus of the study:

- *eThekwini Metropolitan Municipality (Durban);*
- *Msunduzi Municipality (Pietermaritzburg); and*
- *Ilembe District Municipality which focused on Siza Water Company and KwaDukuza (Stanger)*

eThekwini and Msunduzi municipalities account for approximately 91% of Umgeni Water's total supply and are the main focus of this report.

Study objectives

The main objectives of the Water Conservation and Water Demand Management study are to:

- *investigate the potential influence of WC/WDM activities on future water requirements in the study area based on reliable information derived from real case studies;*
- *identify and develop strategies to improve the effective and efficient use of existing and available water resources in all water sectors (urban and industrial);*
- *assess the likely costs associated with the possible WC/WDM activities to enable the savings to be compared with alternative augmentation schemes;*

Summary of urban sector

There is considerable scope for WC/WDM in eThekwini but the municipality already has an advanced WC/WDM programme and should be commended for their efforts.

Msunduzi has a major water loss problem with a very high average consumption. This municipality should embark on a major WC/WDM programme in order to reduce their losses and their consumption.

The water balance shows there is limited scope for reducing real losses in Siza Water. The objective in this area would be to enforce efficiency and reduce customer demand. This can be achieved through tariff increases and consumer awareness.

Although initial indication are that the water losses in KwaDukuza (Stanger) are under control (KZN North Coast WC/WDM study, 2004 and interviews) and to a large extent controlled by the capacity of the KwaDukuza WTW, this assessment is based on perceptions and reliable data is required to quantify these results. It is expected that should the capacity increase, the losses will increase and the municipality should embark on an extensive WC/WDM programme.

Summary of Industrial Mining Power sectors

Industrial users account for a significant part of the water consumption in all the municipalities under consideration. Industrial consumption has grown by more than 5% in most municipalities in recent years and proper metering and billing of these consumers are essential to promote inefficient use and reduce theft.

Bulk Consumer Meter Replacement Programmes and Bulk Consumer Meter Audits have been undertaken by the eThekwini Water and Sanitation Department in industrial areas with positive results. The Msunduzi Local Municipality, who are encountering capacity problems within the water and sanitation department, are currently replacing water meters as required with no existing bulk water meter replacement programme.

Water consumption in most large industrial consumers is closely monitored based on international standards, benchmarks and the significant costs involved in purchasing water. Medium and small companies are often not closely monitored and show significant scope for improvement of water losses and efficiency.

Conclusions and recommendations

Urban sector

From the assessment of the scope for WC/WDM in the KZN Metropolitan Areas, several key issues were identified from which the following conclusions and recommendations were made:

- *WC/WDM can provide a significant reduction in the water demands in the area if the measures are implemented properly and maintained perpetually. The cost of implementing WC/WDM measures is often less than the maintenance costs, which is frequently overlooked with the result that the WC/WDM interventions fail within a year or two of being implemented.*
- *The potential savings that can be achieved in the study area range from a maximum optimistic estimate of approximately 86 million m^3/annum (Scenario 2) in the year 2024 to a more conservative and possibly realistic estimate of 40 million m^3/annum (Scenarios 1 and 3).*
- *Although it is accepted that garden irrigation is less of a problem in KwaZulu Natal due to the high rainfall, garden irrigation using potable water is a huge problem issue in many low income areas where indiscriminate use of hosepipes and potable water is creating both supply and pressure problems. The use of hosepipes must be either banned completely in such areas or the use restricted to an hour or two every 2^{nd} day during off-peak periods. Irrigation during the*

hottest part of the day (from 10h00 to 18h00) should be prohibited simply on efficiency grounds.

- *Government Departments must co-ordinate their efforts with regard to WC/WDM. The efforts of DWAF where the Department is spending large budgets to educate consumers on the evils of hosepipe irrigation is being undermined by the efforts of the Department of Agriculture where it is providing free hosepipes to the same consumers to grow vegetables. Those wishing to grow vegetables in such areas should be provided with buckets or watering cans, which can still be used with good effect without causing the system the problems mentioned previously. Alternatively, roof tanks should be provided to capture rainwater, which is ideal for such irrigation.*
- *DWAF should encourage WDM activities – e.g. fund projects such as providing subsidies for roof tanks and low flush toilets etc. The Department should not encourage the use of low quality fixtures in township retrofitting projects and should rather use the highest quality pipes, meters and fittings for poor areas since the taps and toilets in these areas experience the most frequent usage and lower quality fittings will not last.*
- *Lack of maintenance will result in many systems deteriorating into intermittent supply if action is not taken quickly – particularly in township systems where lack of maintenance has been the status quo over the past 30 years.*
- *Municipalities should be encouraged to combine technical and financial services into a single unit – current trends of separating billing/treasury from water supply/technical is causing major problems and a proper water audit is often not possible since the split between Real and Apparent losses cannot be established with confidence.*

Industrial, mining and power sector

The following recommendations for industrial key areas are as follows:

- *Education and Awareness – Information regarding water conservation and water efficient practices should be readily available for industry to educate employees (most campaigns target the domestic sector);*
- *Bulk Consumer Meter Investigations - It is recommended that bulk consumer meter investigations be considered for industrial areas. Large consumers that are not situated within existing industrial areas should also, however, be included. Meter replacement programmes can then be planned and budgeted for areas identified as having older and non-functioning meters as well as un-metered connections (fire/ unauthorised). An added benefit of such*

initiatives is that the increase in water bills frequently motivates the user to identify water wastage and loss areas and reduce consumption.

- *Water Balance – Large industry should be encouraged to install and monitor process meters and carry out regular water balances in order to adequately monitor consumption;*
- *Industrial Register – All industrial consumers should be required to register potable use, non-potable use, predicted use as well as a water balance and effluent information on an annual basis as part of a water management plan;*
- *Cleaner Production – An increase in the scope and capacity of the National Cleaner Production Centre could allow for more industries to benefit from Cleaner Production including:*
  - *CP Assessments*
  - *Funding to assist with the implementation of CP recommendations*
  - *Investigations for the establishment of new waste minimisation clubs*
  - *The CP database/ repository*
  - *Specialist Advice on CP (and improving water efficiency)*
  - *Up to date technology regarding process efficiencies*
- *Effluent Charges – Stricter control and monitoring of effluent volumes and quality and associated penalties to industries should be enforced. High effluent costs provide a strong financial incentive for industries to reduce losses and wastage and reduce pollutants*
- *Retrofit/ replace old and inefficient technology - Industry should be encouraged to make use of water efficient devices for domestic usage as well as production usage. The return on investment for such technology is often sufficient motivation to retrofit the devices*

A detailed assessment of industries from each of the key areas, representing the relevant industrial sub-sectors is required in order to obtain reliable estimates of the savings that can be expected from the above recommendations for each key area.

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1 INTRODUCTION

1.1 BACKGROUND

The Department of Water Affairs and Forestry (DWAF) has identified the need for the Reconciliation Study in the report "*Internal Strategic Perspective for the Mvoti to Mzimkulu Water Management Area*" (**DWAF, 2004**). The motivation for the study has arisen from the rapidly growing water requirements of the Kwa-Zulu Natal (KZN) metropolitan area, which is a result of the expanding economy, urbanisation of the population in the KZN Province and improved water supply services. Water Conservation and Water Demand Management initiatives by eThekwini Metropolitan Municipality and other Water Service Authorities (WSA's) were successful in slowing the increasing water requirement trend, however, water balance projections (water requirements versus availability comparisons) indicate potential shortfalls in supply are expected to occur and that there is an immediate need for management intervention.

DWAF and other institutions involved in the management of the water resource and supply systems of the KZN Metropolitan Area have, in the past carried out, various studies on intervention measures to improve the water supply situation. The knowledge base that has been created by these studies provides a sound and essential platform from which the reconciliation strategy will be developed. In order to harness this information a Literature Review Report (**DWAF, 2007**) was compiled to summarise the available information in one document and to present a synthesis of the information by highlighting the pertinent aspects of Integrated Water Resource Management that will be assessed and incorporated in the reconciliation strategy.

In broad terms, the objectives of the Reconciliation Strategy Study are to identify, evaluate and prioritize interventions to reconcile the water requirements with the available water resources up to the year 2030. The strategy should be flexible to accommodate future changes in actual water use trends. Given the extent of the current bulk water supply infrastructure, which is owned and operated by different institutions, it is essential to practice integrated intervention planning that extends across institutional boundaries. This is to ensure optimum solutions are identified and implemented in order to maximise the overall benefits to the water users at the end of the water supply cycle.

A further important objective of the study was to carry out extensive stakeholder engagement and consultation during the process of developing the strategy. DWAF wants to partner with the

stakeholders to build on their planned initiatives, and through close co-operations, produce a reconciliation strategy with collective endorsement.

This completion report is a deliverable from the combined WC/WDM tasks of the study and describes the work that was undertaken to formulate the Reconciliation Strategy.

1.2 MAIN OBJECTIVES OF THE WC/WDM STUDY

The main objectives of the Water Conservation and Water Demand Management study are to:

- investigate the potential influence of WC/WDM activities on future water requirements in the study area based on reliable information derived from real case studies;
- identify and develop strategies to improve the effective and efficient use of existing and available water resources in all water sectors (urban and industrial);
- assess the likely costs associated with the possible WC/WDM activities to enable the savings to be compared with alternative augmentation schemes;

The impact of WC/WDM on the agricultural sector is not covered in this report and is included in the Reconciliation Strategy report.

1.3 STUDY AREA

The focus study area stretches from the KwaZulu-Natal North Coast to the Mgeni System (including the Mooi-Mgeni Transfer) with a planned export of water to the South Coast. The area includes portions of the Mngungundlovu, iLembe and Ugu District Municipalities, the Msunduzi Local Municipality and the eThekwini Metropolitan Municipality's area of jurisdiction, see **Figure 1.1** for a map of the study area.

The bulk water supply system of the KwaZulu-Natal coastal metropolitan area consists of an extensive network of water conveyance and treatment infrastructure (pipelines and aqueducts) transferring water from the main storage reservoirs, Midmar, Albert Falls, Nagle and Inanda Dams in the Mgeni River System and Hazelmere Dam on the Mdloti River to the water users. Furthermore, the Mooi-Mgeni Transfer Scheme augments the supply of the upper Mgeni River

(Midmar Dam) and in the far north of the study area Stanger, in the iLembe DM, receives water from the Mvoti River.

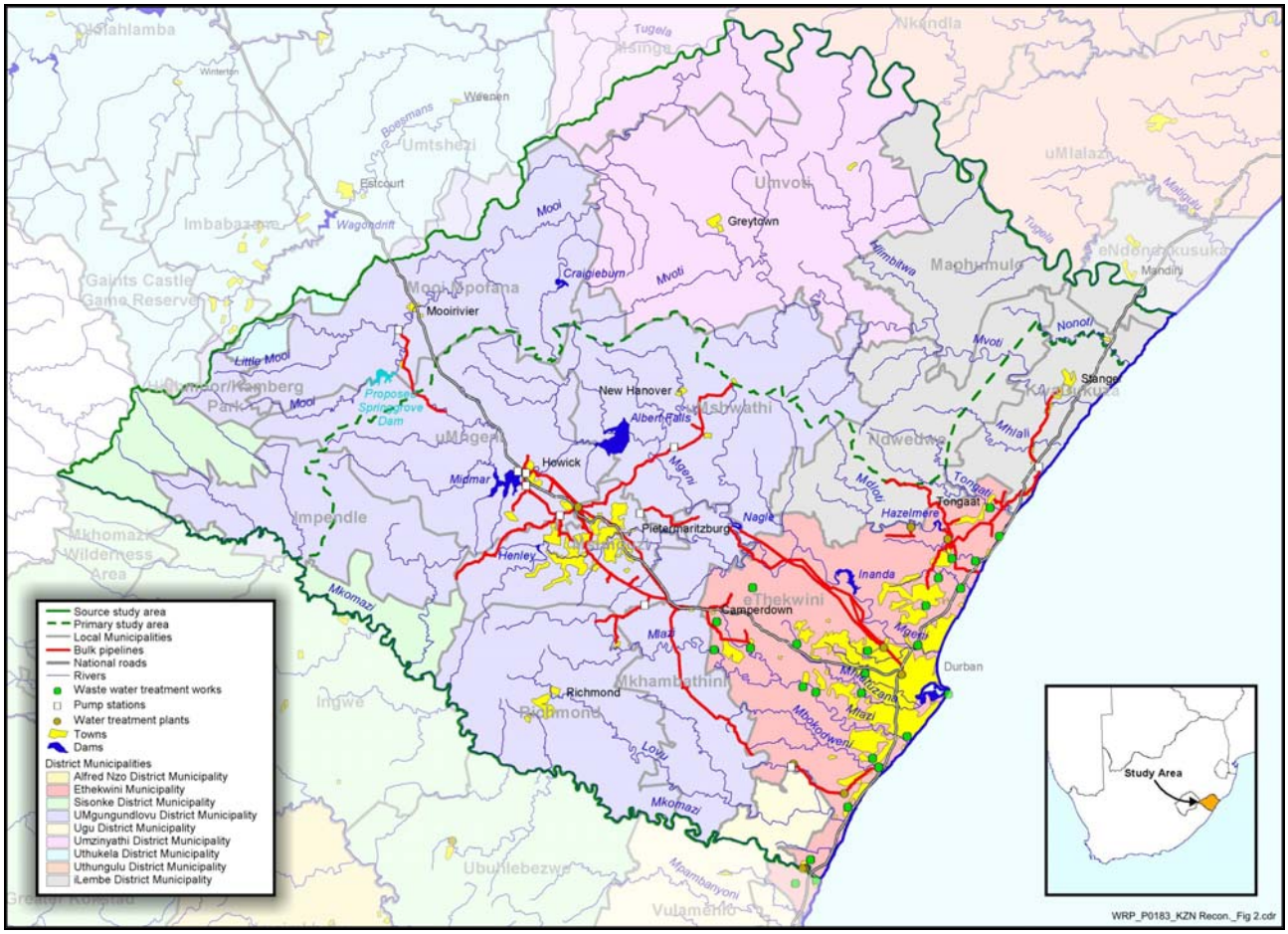


Figure 1.1: Study Area

The study team focused on the large city centres and key demand centres as these centres hold the greatest potential for savings. This does not mean that the smaller areas should not undertake WC/WDM, but potential savings in these areas are negligible compared with the greater supply area. The following municipalities were the focus of the study:

- eThekwini Metropolitan Municipality (Durban);
- Msunduzi Municipality (Pietermaritzburg); and
- Ilembe District Municipality which focused on Siza Water Company and KwaDukuza (Stanger)

eThekwini and Msunduzi municipalities account for approximately 91% of Umgeni Water's total supply and are the main focus of this report.

1.4 METHODOLOGY

The WC/WDM component of the study is one of a few key aspects that feed into the reconciliation strategy as shown in **Table 1.1**. The flow of information and strategy development is shown in **Figure 1.2.**

Table 1.1: Consolidation of tasks

No.	Study Phases	Description
1.1	INCEPTION PHASE	Assemble and assimilate available Information
1.1a		Water demands
1.1b		Water conservation / demand management
1.1c		Water resources
1.1d		Infrastructure
1.1e		Water Quality and re-use
1.1f		Environmental
1.2		Prepare Inception report
2.1	FIRST STAGE RECONCILIATION STRATEGY	Develop Short term requirement scenarios
2.1a		Demographic and Socio-economic assessment (Additional Task – Identified in Inception Phase)
2.2		Assess Interventions
2.2a		Water Conservation / Demand Management
2.2b		Water resources
2.2c		Infrastructure
2.2d		Water Quality and re-use
2.2e		Environmental
2.3		Develop First stage reconciliation strategy
2.4		Report on First stage reconciliation strategy

No.	Study Phases	Description
3.1	SECOND STAGE RECONCILIATION STRATEGY	Develop long term water requirement scenarios
l3.2		Assess sequences of intervention implementation and develop final reconciliation strategy
3.2a		Water Conservation / Demand Management
3.2b		Water resources
3.2c		Infrastructure
3.2d		Water Quality and re-use
3.2e		Environmental
3.3		Document Reconciliation process
3.4		Other issues and concerns
3.5		Report on Second stage reconciliation strategy
4	All phases	Stakeholder Engagement Process
5		Internal Review
6	All phases	Study Management

It should be noted that the study team worked closely with the study teams of all the other projects being undertaken in the study area, which also involve WC/WDM assessments. This includes an Assessment of potential water conservation / water demand management strategies in the Mvoti to Mzimkulu WMA undertaken by the DWAF: Directorate Water Use Efficiency and the efforts between the two projects were properly co-ordinated to eliminate any duplication of effort.

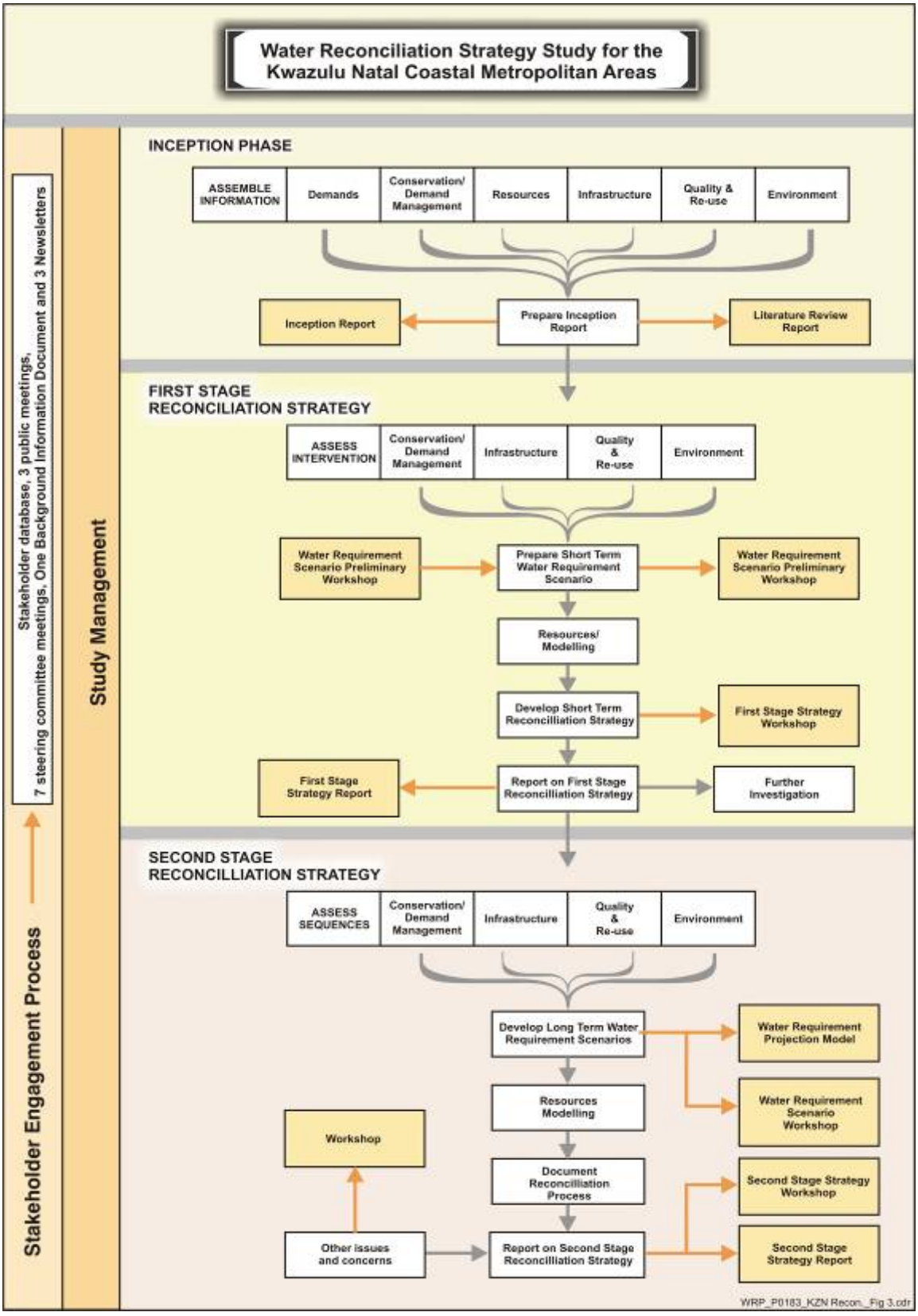


Figure 1.2: Logical Flow Diagram

2 URBAN WATER CONSERVATION AND DEMAND MANAGEMENT

2.1 INTRODUCTION

The objective of this task was to obtain a status quo assessment, review and critically assess the potential savings to be achieved through water conservation and demand management for the major consumers of the KZN coastal metropolitan area. The water use database from the National Water Resource Strategy and Umgeni Water consumption figures were used to identify the key demand centres for the system. The Umgeni Water key demand centres are shown in **Figure 2.1.** Due to time and budget limitations it was not possible to investigate every demand centre and for this reason the investigations were limited to the major demand centres which are responsible for most of the urban water demands in the study area. eThekwini, Msunduzi, Siza Water and parts of Illembe DM, which represents more than 95% of the total Umgeni Water demand, were selected and are discussed in the following paragraphs.

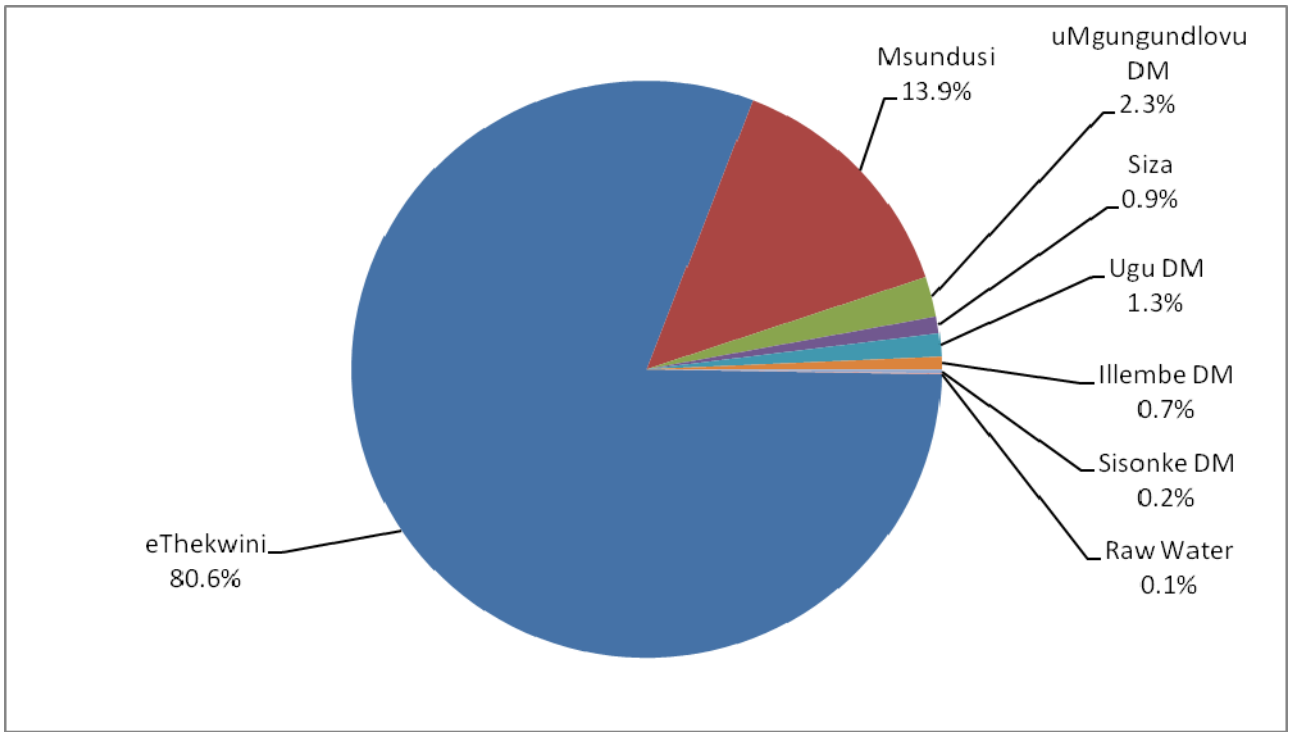


Figure 2.1: Breakdown Umgeni Water Supply (2007)

eThekwini Metropolitan Municipality is the largest municipal consumer (80.6%) in the Umgeni Water supply area with an annual consumption of approximately 300.1 million m^3 (294.3 million from Umgeni Water (2007) and 5.84million from own sources) to a population of 3.4 million (eThekwini, 2007). eThekwini stretches from Tongaat in the North, Cato Ridge in the West, almost reaching Umkomaas in the South with Durban in the middle. Durban is the busiest container port in Africa, the 9th busiest port in the world and a popular tourist destination. Based on an annual consumption of 300.1 million m^3 and population of 3.4million, the average consumption, including industrial use is 242 ℓ/c/d.

Msunduzi Local Municipality or Pietermaritzburg is the second largest consumer (13.9%) in the Umgeni Water supply area with an annual consumption of approximately 51.6 million m^3 (Umgeni Water, 2007) supplying a population of 435 000 (Msunduzi, 2007). It is situated 100km from Durban along the N3 corridor between Johannesburg and Durban. Based on an annual consumption of 51.6 million m^3 and a population of 435 000, the average consumption, including industrial use is 325 ℓ/c/d.

Siza Water is the fifth largest consumer in the (0.9%) in the Umgeni Water supply area with an annual consumption of approximately 3.1 million m^3/annum (Umgeni Water, 2007) to a population of 35 000. Siza Water, a company providing water and wastewater services, commenced operations in 1999 and serves the coastal town of Ballito and the surrounding areas including Shakas Rock, Salt Rock, Sheffield Beach, Tinley Manor, Shakaskraal and Umhlali.. Ballito is approximately 40km north of Durban, and is a fast-growing residential and holiday destination. Based on an annual consumption of 3.1million m^3 and population of 35 000, the average consumption, including industrial use is 432 ℓ/c/d.

KwaDukuza (Stanger) in the iLembe District Municipality has an annual consumption of approximately 4.38 million m^3/annum (KwaDukuza WTW capacity of 12Mℓ/day) to a population of approximately 47 000 (KZN North Coast WC/WDM Assessment Study, 2004). The area is supplied from the KwaDukuza WTW situated on the Mvoti River and augmented, during emergencies, from Hazelmere WTW. Based on an annual consumption of 4.38million m^3 and population of 47 000, the average consumption, including industrial use is 255 ℓ/c/d.

2.2 TERMINOLOGY

In recent years, there has been a growing realisation that a standard methodology and terminology is required to assist Water Utilities in assessing the water balance of their systems. The use of terms such as leakage, Unaccounted-for Water (UFW or sometimes abbreviated to UAW), Non-Revenue Water (NRW), real losses and apparent losses tends to confuse if the terms are not explained properly. In this regard, it is now generally accepted throughout most countries in the world that the standard terminology used and promoted by the International Water Association (IWA) is the most robust and comprehensive approach. The elements of the IWA water balance are shown in **Figure 2.2**. This water balance represents many years of discussion and debate and has been accepted by virtually all water auditing and leakage management specialists worldwide.

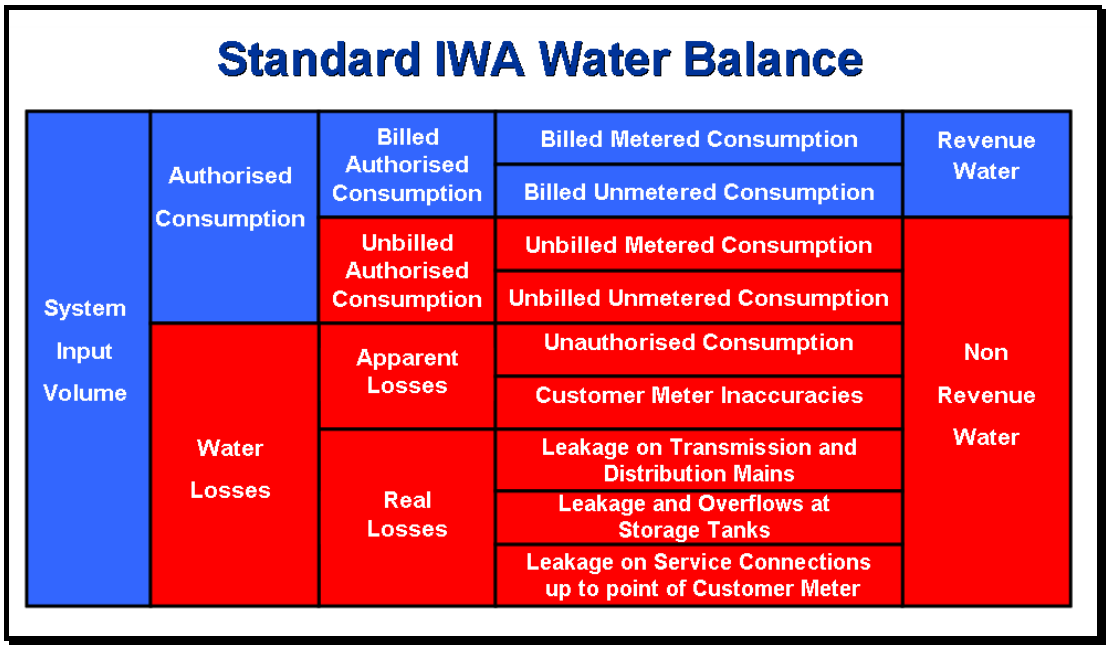


Figure 2.2: The Standard IWA Water Balance

Figure 2.3 presents a modification to the IWA water balance for South African circumstances as proposed in the recently completed Water Research Commission project (Seago and Mckenzie, 2006). In the figure, it can be seen that the Revenue Water component has been split into three smaller components. It was felt that this modification was necessary in the South African context because water that is billed in South Africa is not always paid for by the customers. While this problem is normally a very small component of the overall water balance in most developed countries, it is known to be a large component of the water balance in most low income areas of South Africa. In other words, it is found in many municipalities throughout South Africa that the

"revenue water" often includes a large component that may be metered and billed but will never be paid due to the financial limitations of the customers. In South Africa, the "Billed Water" can therefore not always be termed revenue water. This "bad-debt" phenomenon is common in many municipalities throughout South Africa, however, the proposed modification to the water balance is necessary due to the relatively large quantities of billed water for which no income is received. An additional complication involves the free basic water allowance involving 6 kℓ of water per property per month which is supplied free of charge. This water is authorised, and is technically considered to be billed (metered or unmetered), but billed at a zero rate. The application of this policy is a complex issue and is discussed further in this section. The free basic water is still considered to be revenue water although it is charged at a zero rate.

The key issue requiring the modification to the IWA water balance is the fact that in some cases, a large portion of the billed consumption is not paid for by the customer and will in fact never be paid for due to the financial limitations of the customer. If proper billing and payment mechanisms are created to ensure that all water is paid for by the consumers, the water used will decrease significantly. In effect, the portion of the "Potential Revenue Water" that is shown as "Non-Recovered Revenue" water in **Figure 2.3**, represents a potential saving that can be achieved through appropriate WDM activities. For this reason, the block has been highlighted in red in the figure, which signifies non-revenue water as opposed to genuine revenue water.

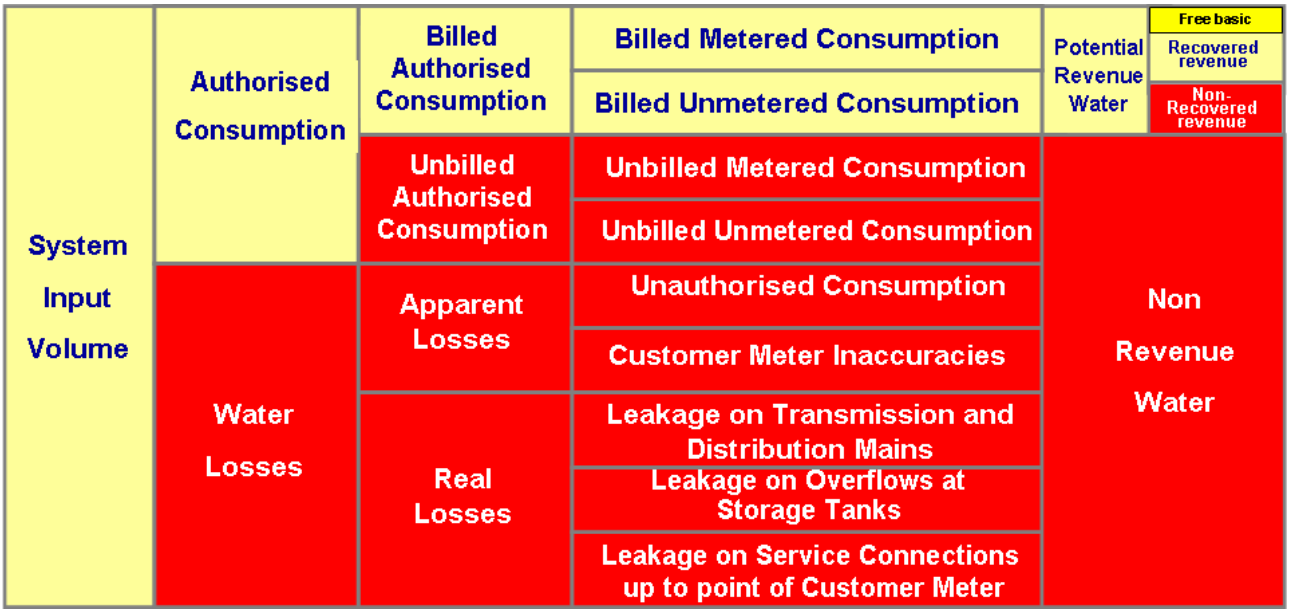


Figure 2.3. Modified IWA water balance for South Africa (from Seago and Mckenzie, 2006)

For clarification, some of the key components of the water balance are discussed further in the following paragraphs and were incorporated in the calculations to determine the potential savings through WC/WDM. More details on the components of the standard water balance can be found in the report Assessment of non-revenue water in South Africa (WRC Project No. **K5/1535**) (Seago & McKenzie, 2007).

Non Revenue Water

In many instances, the term Unaccounted for Water (UAW or UFW) is used to indicate the level of wastage in a water distribution system and this has become the standard term adopted by most utilities around the world. This term, however, is open to subjective judgement with the result that it can be manipulated to some extent based on various assumptions as discussed previously. Numerous papers and presentations on the subject have been presented at conferences around the world and all clearly recommend that the term UAW is replaced with the term Non-Revenue Water (NRW) which cannot be manipulated to the same extent.

Apparent Losses

The issue of apparent losses (administrative and metering errors including theft of water) continues to be a problem area, particularly in the South African context. Due to the manner in which water is measured and billed in certain parts of the country, it is often very difficult to differentiate between the apparent losses and the real losses. Under normal circumstances, apparent losses are valued in terms of the selling price of the water on the assumption that such losses can be converted to sales if the water is measured properly and billed effectively. In the South African situation, this is often not the case since much of the unbilled water is effectively household leakage or simply gross wastage occurring after the domestic meter. The problem arises in such cases where the water is either not being billed according to the metered consumption (as is the case with a flat rate tariff) or it is not being paid for. Various projects have been initiated to address this issue and in most cases, the water consumption drops significantly, when the payment issue is resolved and the consumers start to pay for water based on the metered use. The suggested default values for use in South Africa are presented in **Table 2.1** (Mckenzie and Seago, 2005).

Table 2.1: Suggested default values for apparent losses for South Africa

Illegal connections		Meter age and accuracy			Data transfer	
			Good Water	Poor Water		
Very high	10 %	Poor > 10 years	8 %	10 %	Poor	8 %
High	8 %					
Average	6 %	Average 5- 10 years	4 %	8 %	Average	5 %
Low	4 %					
Very low	2 %	Good < 5 years	2 %	4 %	Good	2 %

Note: Percentages represent percentage of current annual real losses

It should be noted that any underestimation in the Apparent Losses will result in an over-estimation of the real (physical) losses which in turn will be reflected in various performance indicators for Real Losses including the Infrastructure Leakage Index (ILI). In many municipalities, the responsibility for the Apparent Losses lies with the Treasury Department while the responsibility for the Real Losses lies with the Water Supply and Sanitation Department. By assuming that the Apparent Losses are very low when in fact they may be very high will simply shift the apparent "blame" onto the wrong department.

As can be seen in **Table 2.1**, the allowances are generally small and effectively represent the "best practice" values that could be expected from a very well managed system.

Billed consumption that is not paid for

As discussed previously, to address the South African situation it was necessary to add a final column to the IWA water balance whereby revenue water (or more accurately termed "potential revenue water") is divided up into recovered and non-recovered revenue. This section deals with the non-recovered revenue water which is water that is billed but never paid for. These figures are often difficult to obtain from the various municipalities since the revenues collected generally lie within the financial section of the WSA rather than the technical section. Some of the Metros and Municipalities indicated that this is a major problem since the technical section is often held accountable for non-revenue water; however, they do not obtain accurate figures for this portion of non-revenue water.

It is very important to realise that in the South African situation, it is unlikely that much of the authorised (currently both billed and unbilled) water that is not paid for can in fact be converted to fully recovered revenue water. As soon as the payment process is formalised and enforced, the

water consumption tends to drop significantly. For example 5 000 households in a certain area do not pay for water because they do not receive a bill or because payment is not enforced. These 5000 households each use on average 50 kℓ per month of which 6 kℓ / household / month is the free basic component and 44 kℓ / household / month should effectively be paid for. The WSA that supplies these households sells water at R2 / kilolitre. The WSA should not assume that it will automatically obtain R440 000 (44kℓ x 5000 houses x R2) if payment is enforced since it is likely that much of the 44 kℓ / household / month is wasted as the users never intend to pay for it. Should payment be enforced they are likely to use water much more sparingly and could drastically drop their consumption.

Unbilled metered consumption

In the KZN WC/WDM Study Area, it was found that most of the Metro's and Municipalities have a policy for metering all connections and billing the consumers based on metered consumption. There are a few key exceptions where large areas are supplied with water which is metered but no accounts are sent to the consumers. In such areas, meters have been installed, however, the WSA does not have a proper billing system in place or there is simply unwillingness on the part of the consumers to pay for services. In many cases, the meters are vandalised or covered by dirt which prevents the meter readers from reading the meters as shown in **Figure 2.4.**



Figure 2.4: A customer meter which cannot be read

Unbilled unmetered consumption (Flat rate)

A new portion of the unbilled unmetered consumption component was introduced due to the specific circumstances of some South African WSA's. It is known that the deemed consumption of the consumers that are being billed on a flat rate amount, is significantly lower than their actual consumption.

Unauthorised consumption

Experience shows that unauthorised connections tend to be highest in low income areas where billing is taking place. Most of the municipalities in the study area confirmed that they consider unauthorised connections and illegal use of fire-fighting water to be a serious problem. Most of the water suppliers in the study area are aware of the problem, and are attempting to eliminate it by removing or legalising any unauthorised connections that they find as well as metering all fire fighting connections.

It may be argued that there is no longer a problem of unauthorised connections in South Africa since all people have the right of access to basic water use. The definition of an unauthorised connection used here is where a consumer connects directly onto a distribution pipeline or other water source without the knowledge of the water supplier, or when a person who has an existing metered service connection bypasses the meter and uses more than the basic allocated amount. Examples of this are shown in **Figure 2.5** and **Figure 2.6**.



Figure 2.5: An illegal connection where a consumer meter has been bypassed



Figure 2.6: An illegal connection on an air valve

It should be noted that one common problem where unauthorised connections certainly exist concerns the situation where residents convert a single standpipe connection into multiple individual household connections. This can cause problems with system capacity constraints since the original system was designed for standpipe use and not individual metered connection use.

Customer meter inaccuracies

Customer meter inaccuracies are mostly dependant on the age of the meter, as well as the water quality of the area. Most water suppliers stated that they thought their meters were in a fair condition. It is difficult to estimate the amount of water theoretically "lost" through meter under registration. Poor customer meters are generally found in lower income areas.

Leakage on transmission and distribution mains

Often viewed as the main contributor to real losses, leakage on water mains is made up of bursts and background leaks. A certain portion of leakage is unavoidable, and all systems will leak to some extent. Leakage in excess of the accepted minimum levels is usually due to low maintenance on distribution systems. A lack of maintenance, in turn, often results from insufficient funds and/or capacity within the WSA and tends to be more of a problem in lower income areas. Another contributing cause of such leakage occurs when consumers are not aware of the necessity to save water and therefore allow bursts to continue without reporting them. Water

losses in such cases can often be reduced through social interventions such as public awareness campaigns and education activities.



Figure 2.7: A leak that has not been reported

Keeping good records of pipe bursts within a WSA can often assist the WSA in determining problem areas within their systems. Pipe bursts are usually a result of either high pressures or older pipes. Plotting the bursts on a map as they occur will highlight these areas and assist with planning of interventions such as pressure reduction or pipe replacement. It is also useful to continue record keeping once interventions have taken place in order to show the affects of such interventions.

Leakage on overflows at storage tanks

Unfortunately, the issue of reservoir overflows is often underestimated since much of the spillage occurs at night when no-one is aware of the leakage. In general, however, most reservoirs in South Africa are of reasonable quality and reservoir leakage is regarded as a minor issue in most areas. **Figure 2.8** shows overflow at a reservoir.



Figure 2.8: Overflow at a Tower Reservoir due to theft of electrical cabling

Leakage on service connections up to the point of customer meter

In most systems, leakage from connections is by far the greatest source of physical leakage; often 80% or more of the total physical losses. A portion of the service connection leakage also contributes to the unavoidable annual real losses. The total volume of water lost as a result of this leakage is therefore dependant mainly on the number of service connections within a system and the average operating pressure.



Figure 2.9: A leak at a service connection

2.3 STATUS QUO ASSESSMENT

2.3.1 General water loss contributing factors

The municipalities are characterised by institutional, financial, operational and maintenance problems which directly affect WC/WDM initiatives but are difficult to address and quantify. Typical problems that are experienced by the municipalities, and most other municipalities across the country include the following :

Loss of skilled resources and expertise in the water sector - Municipalities are often run by skeleton staff and lack skilled resources. Limited time is invested in planning and most is spent on crisis management.

Supply minded thinking and system operation - Historically engineers have increased the supply from new sources as the demand increased rather than addressing the demand; the key objective being to supply water, with no consideration for WC/WDM. Zone boundaries are compromised as low-pressure problems in zones are resolved by opening pressure reducing valves or boundary valves rather than identifying and addressing the cause of the problem. Changing this mind-set is difficult and will take time coupled with ongoing training.

Lack of system understanding - The system design and operation is not well documented and municipalities have experienced major staff turnover in recent years with many posts often not refilled.

Lack of system control - The municipalities do not have access to information systems that supply demand trends and patterns.

Lack of funds - The financial situation of municipalities has deteriorated to such an extent that operation and maintenance functions cannot be correctly performed. Often the municipalities cannot apply for funding, as they are not credit worthy.

Lack of maintenance - Control valves and water meters are not maintained. Very few municipalities can provide you with control valve and bulk meter details such as size, model, make, settings, historical readings, service dates, etc. These points are often critical in the efficient operation of the system.

It has been found that the management and maintenance of water infrastructure is a key stumbling block to the implementation of WC/WDM interventions. Some typical examples that exist in most parts of the country are illustrated in **Figure 2.10** and **Figure 2.11.**



Figure 2.10: Example of a valve chamber after cleaning



Figure 2.11: Example of a poorly maintained valve chamber

The proper operation and maintenance of water infrastructure is essential in the implementation of WC/WDM interventions. These interventions would typically include sectorisation, bulk metering, pressure management and resolving supply problems such as low pressure problems and intermittent supply. If these problems are not addressed the customer will receive a poor level of service which may result in a reluctance to pay.

Consumer metering - Consumer water metering is one of the key problem areas and includes;

- Illegal connections,
- theft through fire connections,
- lack of or poor water meter readings
- Old inaccurate and poorly maintained meters
- broken meters

Another key problem is the interface between Technical and Treasury operations within the municipality. Most municipalities are unwilling to allow the Water and Sanitation Departments to operate and run the complete water service, which includes billing and treasury operations. As a result, there is often major conflict between the two departments which leads to serious inefficiencies and general apathy amongst many of the managers.

Institutional arrangements - The roles and responsibilities of the Water Services Authority (WSA) and the Bulk Water Service Provider are sometimes not clearly defined through service agreements resulting in certain aspects being neglected. Most municipalities also do not have dedicated WC/WDM section.

Garden Watering – Another problem facing municipalities is excessive garden watering by un-billed or fixed tariff customers. The situation is very serious and must be addressed by municipalities and government departments. Excessive garden watering results in huge losses from the system as well as lowering the system pressure and is causing serious problems for many Municipalities particularly when hosepipes are used to irrigate lawn areas as shown in **Figure 2.12** and **Figure 2.13.**



Figure 2.12: Typical garden irrigation in township area



Figure 2.13: Unauthorised irrigation in industrial area

There are several key issues associated with garden watering which can be summarised as follows:

- Most municipal water supply systems cannot sustain the minimum level of service during peak demand periods when excessive garden irrigation takes place. Such irrigation causes major problems since the normal water pressure cannot be sustained in the higher lying areas. Garden irrigation can result in an increase of almost 30% on the water demand in an area. It

should be noted that that the key problem is not the irrigation of gardens as such but rather the abuse of water where residents irrigate during the peak demand periods using hosepipes which in many instances are left running unattended for many hours. Many of the systems have been designed to provide a reasonable water supply even in cases where there is no payment for water. Such systems cannot support many thousands of hosepipes running simultaneously during the peak demand periods.

- As mentioned before, the excessive garden watering results in low pressure or even intermittent supply problems at the critical point. As soon as the customer receives intermittent supply, they tend to leave buckets underneath the taps. They then leave the tap open and wait for the water to come back on which is often only late at night when everyone is asleep. This results in the bucket overflowing most of the night.
- Another problem associated with excessive garden irrigation, is the water that percolates into the ground and eventually surfaces at the low points in the area as "man made groundwater". Such groundwater is shown in **Figure 2.14** and the consequences are shown in **Figure 2.15**, which highlights the plight of one family whose house is located towards the low lying area in a township. The picture was taken during the winter period many months after the last rains of summer. The water shown in the picture is not sewer overflows but rather groundwater originating from garden irrigation in the higher lying areas of the township. The same situation has been observed in many other areas including Emfuleni, Rustenburg and in several parts of the Western Highveld area. In all of the cases, the houses were constructed on relatively dry land which only became a marsh after the houses had been completed and the leakage/garden irrigation caused the excessive groundwater. The solution to this problem is quite simple and can be implemented immediately – a complete ban on hosepipe use. Alternatively, hosepipe use can be restricted to allow irrigation for a maximum of 1 hour every 2nd day as is currently the case in many parts of South Africa (e.g. Knysna) where users who pay for water are restricted on all irrigation use.



Figure 2.14: "Man made groundwater" in Rustenburg



Figure 2.15: House damaged by manmade groundwater

Another interesting issue that arose concerning garden watering relates to the recent promotion of vegetable gardens in many low income areas. Many such gardens are now being established in many parts of South Africa as shown in **Figure 2.16** and **Figure 2.17**.



Figure 2.16: Vegetable garden being irrigated with potable water

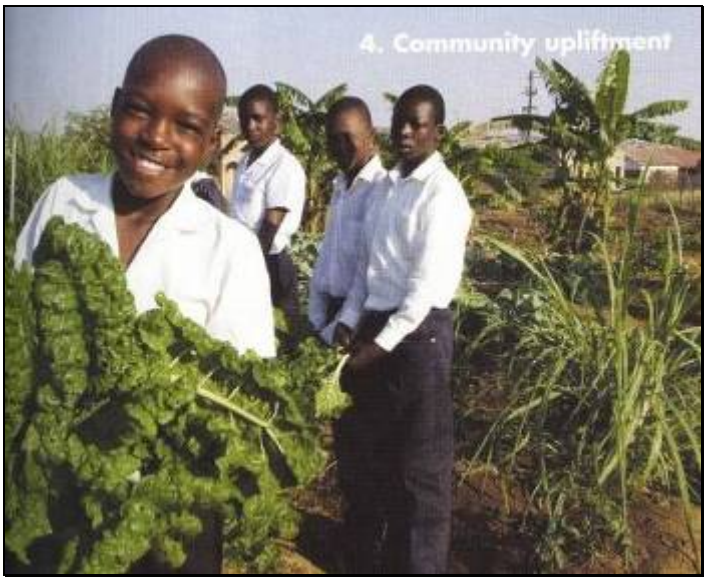


Figure 2.17: Vegetable growing in low income areas (Photo courtesy Food and trees for Africa)

While the motives of the various government organisations and NGO's such as Food and Trees for Africa are to be highly commended for their efforts and good intentions, there is a problem when the residents use potable water to irrigate the crops using hosepipes. One government Department (Department of Agriculture) has even gone to the extent of providing free hosepipes to residents to help them establish their vegetable gardens – in the same area that DWAF has spent R800 000 on a public education campaign to discourage the use of hosepipes. The situation becomes ridiculous when some residents are happy to use potable water to grow vegetables when

many of their neighbours now experience intermittent water supply which can result in typhoid and cholera due to the ingress of sewage into the empty water supply pipes.

2.3.2 Water balance calculations

In order to understand the potential for water savings in each municipality, the first step was to derive a standard annual water balance using the latest International Water Association methodology. While such water balances are very helpful and are now required annually by DWAF, they must be used with caution since certain components are to some extent subjective. For example, the basic water balance will provide a realistic indication of the total Non-Revenue water and the Total Losses. In most cases, these two components are almost the same; however, it is often very difficult to split the Total Losses into the Administrative Losses (Apparent Losses) and the Physical Losses (Real Losses). Where possible, this split was undertaken based on information supplied by the Municipality with regard to their own estimates of the quality of their meters as well as the level of water theft in their systems. In addition, many of the municipalities have two different departments addressing the technical and billing aspects of water supply. In such cases, the billing and cost recovery aspects are managed by Treasury and in many cases, the Treasury departments are not able to provide proper information on the water billed or level of recovery. In such cases, the split between the Real and Apparent losses may not be accurate although this will not influence either the Non Revenue Water or the Unaccounted for Water. The results from the various water audits undertaken for each Municipality are provided in **Figures 4.18 to 4.21.**

The non-revenue water in areas under consideration varies between 30 and 50%. The level of leakage in eThekwini is well in line with the national average whereas Msunduzi has very high levels of non-revenue water and high average consumption levels.

WATER BALANCE FOR: **eTHEKWINI METROPOLITAN MUNICIPALITY** 2005 - 2006

	Component	(million m³/annum)	%
1	Bulk system input volume	300	100%
2	Authorised consumption	231	77%
3	Billed authorised	207	69%
	Unbilled authorised	24	8%
	Total losses	69	23%
4	% Total losses apparent	13	4%
	Real losses	60	20%
	Apparent losses	9	3%
	Revenue water	207	69%
	Non-Revenue water	93	31%

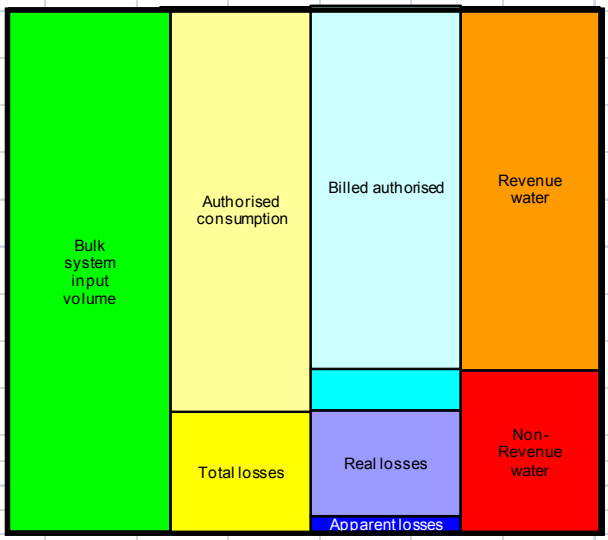


Figure 2.18: Water balance for eThekwini (million m³/annum)

WATER BALANCE FOR: **MSUNDUZI MUNICIPALITY** 2005 - 2006

	Component	(million m³/annum)	%
1	Bulk system input volume	16.18	100%
2	Authorised consumption	7.13	44%
3	Billed authorised	7.13	44%
	Unbilled authorised	0	0%
	Total losses	9.05	56%
4	% Total losses apparent	20	124%
	Real losses	7	45%
	Apparent losses	2	11%
	Revenue water	7	44%
	Non-Revenue water	9	56%

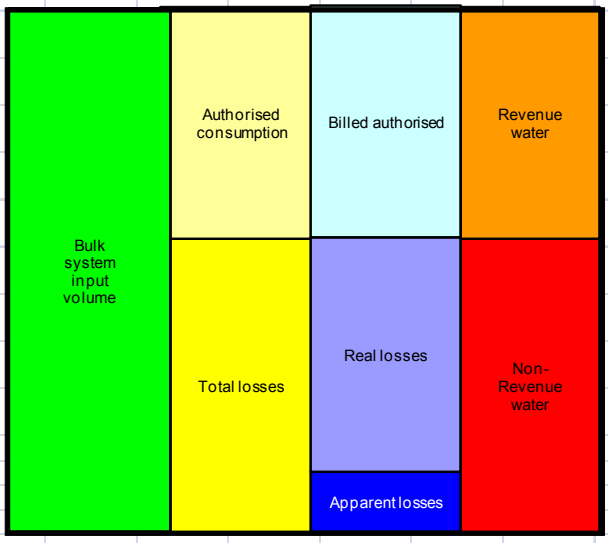


Figure 2.19: Water balance for Msunduzi (million m³/annum)

WATER BALANCE FOR: **KwaDukuza (Stanger)** 2005 - 2006

	Component	(million m^3/annum)	%
1	Bulk system input volume	4.38	100%
2	Authorised consumption	4.0	91%
3	Billed authorised	3.5	80%
	Unbilled authorised	0.5	11%
	Total losses	0.38	9%
4	% Total losses apparent	20	457%
	Real losses	0.3	7%
	Apparent losses	0.1	2%
	Revenue water	3.5	80%
	Non-Revenue water	0.9	20%

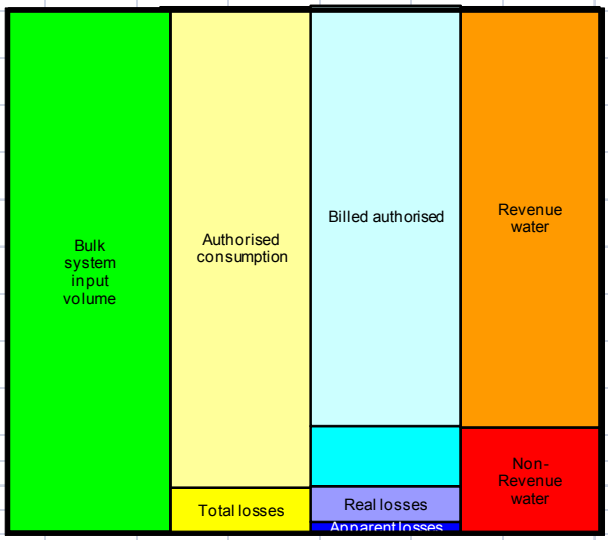


Figure 2.20: Water balance for Stanger

WATER BALANCE FOR: **SIZA WATER** 2005 - 2006

	Component	(million m^3/annum)	%
1	Bulk system input volume	3.14	100%
2	Authorised consumption	3.0	96%
3	Billed authorised	2.8	89%
	Unbilled authorised	0.2	6%
	Total losses	0.14	4%
4	% Total losses apparent	20	637%
	Real losses	0.1	4%
	Apparent losses	0.0	1%
	Revenue water	2.8	89%
	Non-Revenue water	0.3	11%

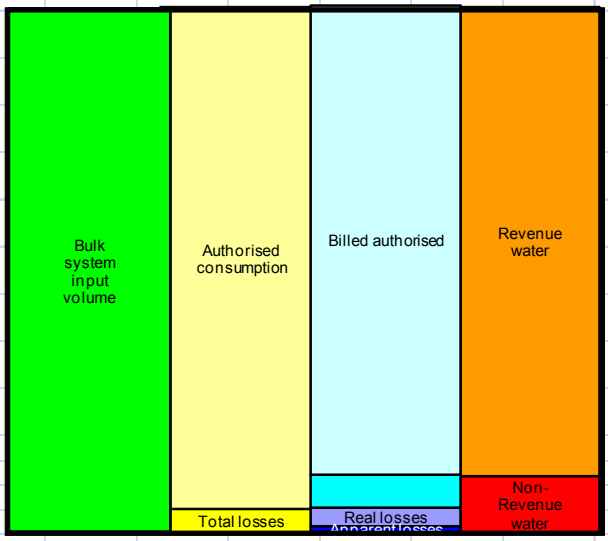


Figure 2.21: Water balance for Siza Water

2.3.3 Summary of average water consumption for major centres

Average water consumption for the areas under consideration are summarised in **.**

Table 2.2: Summary of average water consumption (2007)

KPI \ Area	eThekwini	Msunduzi	Stanger	Siza Water
Population	3.4 million	435 000	47 000	35 000
Number of households	808 000	103 000	10 500	6 900
Annual water demand	300.1 million	51.6 million	4.38 million	3.14 million
ℓ / capita / day	242	325	255	432
kℓ / household / month	31	42	35	38
% Non-revenue water	31%	56%	20%	11%

The average water consumption in Msunduzi and Siza Water supply area is very high. The high consumption in Msunduzi can be attributed to the high level of leakage in the area whereas the high consumption in Siza Water can mainly be attributed to the mainly affluent life style in the area although water is supplied to a diverse socio-economic spectrum.

Although the non-revenue water in eThekwini is relatively high, the average consumption is very similar to most metropolitan areas in the country and within an acceptable range.

2.3.4 eThekwini Metropolitan Municipality

eThekwini appears to have well maintained and well managed water supply infrastructure. Based personal interview held with the municipality, the status quo of WC/WDM in eThekwini could be summarised as follows:

Strengths

- Pressurised water supply system to all customers 100% of the time;
- Good residential and commercial metering and billing system;
- Efficient leakage reporting system;
- Planned maintenance conducted on infrastructure;
- Digital as-built drawings available for all infrastructure;
- Efficient WDM section in place;

- Active leakage control contractors in place;
- Team dedicated to social issues such as conducting workshops and education programmes in communities and schools; and
- Extensive range of WC/WDM posters and leaflets for educational purposes in Zulu and English.

Weaknesses

- UAW or NRW greater than 30%;
- Control and boundary valve maintenance programme needs to be improved; and
- Currently not making use of local media / press to promote WC/WDM.

WC/WDM Projects Planned or Underway as on January 2007

- Active leakage detection has been conducted on approximately 14 645km of water mains. 25 420 leaks have been identified and repaired through this initiative. An additional contract for a further 4 500km of leak detection through visual inspection, sounding, step testing and correlation has been awarded. Site visits to properties will also be conducted under this contract to verify that identified non-domestic consumers have water meters;
- A contract has been let to fast track the installation of non-domestic water meters;
- Rectification of billing data and installation of meters to previously un-metered consumers. The Water Services Department is conducting the installation of 12 000 domestic water meters in the Inanda, Umbumbulu, Folweni and Fredville areas;
- Council has approved the expenditure of R550 million to replace all 100mm and 150mm AC mains. Phase 1, of this project commenced in July 2007. This involves replacing 1700km at a cost of R110 million; the expected payback period for the project is 12 years;
- Analysis and replacement where required of top 1000 consumer water meters. Currently all top 1000 consumer meters are less than 10 years old and top 200 consumer water meters are less than 5 years old. Budget for this exercise is approximately R10 million;
- Roll out of advanced pressure control to 50 sites;
- A contract has been let for the permanent monitoring of all pressure reducing valves greater than 50mm;
- Six advanced warning devices have been installed on critical Pressure Reducing Valves (PRV's) to alert when PRV's have failed through a pilot project based on GSM linked to SMS and email.
- Implementation of a project to progressively reduce pressure in the Durban CBD area to reduce losses;

- A management contract has been awarded to monitor and manage Non Revenue Water in the Umlazi area for a 12 month period;
- All old un-metered standpipes in informal areas will be metered by July 2007, approximately 1000 standpipes;
- Lowering of the average pressure in the Umlazi 2 reservoir zone from 48m to 40m to reduce the NRW by an anticipated 20%. Plans are to roll this out to the rest of the reservoir areas in Umlazi;
- Forced plumbing repairs to houses in former R293 areas with arrears greater than 60 days;
- Rectification of billing data in rural ground tank areas, approximately 5000 tanks;
- Pilot project in Amanzimtoti to use CSA's and caretakers to increase billing (formal area) and reduce losses (informal area);
- Site visits are being conducted to properties where water has been disconnected for non-payment or tampering. Visits are also being made to properties where there are reports of illegal connections;
- Installation of bulk meters on the outlets of 240 reservoirs and elevated tanks;
- Creation and verification of discrete supply zones throughout the EWS supply area;
- Software has been developed to conduct water balances on the Arcview platform. Additionally all the requirements for the NRW department have been incorporated into the new Revenue Management System;
- 20 Point intervention plan in the Montille reservoir area;
- Introduction of an Asset Management Programme to house the control valve data and to ensure active maintenance takes place;
- Monitoring of various critical bulk water meters on-line with GPRS technology has now been implemented;
- Check meters are planned to be installed on 65 Umgeni Water meters;
- Project to address a recently discovered old NPA area in which consumers are not being billed.
- Project to install electromagnetic flow meters on 1400 fire supply connections which are not currently metered;
- Programme to finalise sectorisation and metering and read all zone meters on a monthly basis;
- Programme to improve the management and maintenance of boundary and control valves;
- Work in progress to convert the existing Asset Register to an electronic format across a number of sections;
- Ongoing programme of visual and acoustic leak detection;

- Very pro-active, ongoing programme by dedicated staff running water workshops throughout the community, schools and community centres; and
- Ongoing programme of visiting the worst paying wards with dedicated teams knocking door to door.

Recommended Projects / Interventions

eThekwini have a very progressive approach to WC/WDM and can be commended for the way in which they manage their system. They are aware of their weaknesses and are working on improving them. There is limited scope for major water savings through WC/WDM within the Metro, however there may be pockets with high leakage that could be addressed.

Evaluation of the IWA Water balance for eThekwini indicates that 69% of the water supplied by eThekwini is to Billed Authorised Consumption. Potential therefore exists to reduce the demand by targeting end user efficiency as summarised below;

- Social interventions in the press and media to encourage domestic water consumers to be more water efficient.
- Use of water efficient plumbing devices such as low flow showerheads and duel flush toilets.
- Garden watering restrictions such as no watering between 8am and 4pm and odd and even street numbers being allowed to water on different days of the week.
- Concessions to consumers for the installation of rainwater tanks and pumps for garden watering;
- Eradication of tip tray urinals and servicing of plumbing infrastructure in commercial and state buildings;
- Implementation of leak repair and retrofitting projects in schools and other institutions;

It is recommended that eThekwini continue implementing and maintaining WC/WDM interventions and offering support to neighbouring Municipalities.

The complete scorecard for eThekwini is included in **Appendix A**.

2.3.5 Mzunduzi Local Municipality

WC/WDM in Msunduzi requires urgent attention. The status quo of WC/WDM, based on personal interview, can be summarised as follows :

Strengths

- Maintain a pressurised system 100% of the time to a minimum pressure of 20m.
- Efficient leakage reporting system in place.
- Fairly effective WDM section, however, more staff is required for this section.
- Good bulk and zone management metering.
- Significant pressure management undertaken, however, a lack of maintenance of these installations is evident.

Weaknesses

- UAW > 40% - primary influencing factor is the lack of domestic meter reading, non-payment for water and illegal connections.
- Old non-domestic meters – audit of these meters is required
- Lack of planned maintenance of infrastructure
- Control and zone boundary valves not well maintained
- Lack of accurate digital as-built drawings
- Poor asset register
- Poor active leakage control
- Very little or no school and community awareness and education programmes related to WC/WDM
- No use of local media to promote WC/WDM
- No WC/WDM posters or educational material available

Recommended Projects / Interventions

There is significant scope for WC/WDM efforts within the Msunduzi Local Municipality. The following interventions are recommended and are listed in order of their potential to create water savings and reduce NRW within the municipality;

- Verify zone discreteness.
- Log flows into the zones and pressures within the zones
- Analyse pressure and flow data and identify areas of high losses and high pressures
- Service and set all control valves within the network
- Implement active leak detection and repair exercises within high water loss zones
- Conduct a detailed meter audit of all “Non-Domestic” consumers followed by the repair / replacement of all erroneous or missing meters.

- Conduct a social project to address the culture of non-payment that has developed in many of the low cost areas of Msunduzi.
- Conduct a social project to address the problem of illegal connections within Msunduzi.
- Appoint two additional staff to the WC/WDM section. Successful candidates for these positions will require significant capacity building and training. It is recommended that this be undertaken by involving them in the implementation of the abovementioned tasks by a suitably qualified specialist WC/WDM consulting firm.
- Digitise all existing drawings and develop a GIS management system and hydraulic model.
- Develop a planned maintenance programme. The municipality should dedicate 2% of the capital value of its water related infrastructure to the planned maintenance of this infrastructure annually.
- Develop a water infrastructure asset register detailing all water infrastructure including the following;
  - Water treatment works
  - Reservoirs and storage tanks
  - Pump stations
  - Bulk mains
  - Reticulation network
  - Bulk and management meters
  - Control Valves
- Develop a Customer Care section to tackle social issues such as;
  - The conducting of Community and School Education and awareness programmes relating to WC/WDM.
  - Promotion of the importance of WC/WDM in the local press and on local Radio Stations
  - Procurement and development of educational material in several languages that promote WC/WDM
  - Training and capacity development is required to empower these candidates to undertake these tasks.

The complete scorecard for Msunduzi is included in **Appendix B**.

2.3.6 ILembe District Municipality

The status quo of WC/WDM in iLembe District Municipality, based on personal interview, can be summarised as follows:

Strengths

- Fairly reliable billing system, approximately 90% of all consumers are billed;
- An efficient leakage reporting and repair system;
- Fairly well sectorised network, however, this needs to be verified; and
- Informative / itemised billing

Weaknesses

- No reliable water balance in place
- No planned maintenance of infrastructure – reactive maintenance only
- No Water Demand Management section in place
- No control and boundary valve maintenance due to lack of staff
- Inadequate Zone management metering system
- Inadequate as-built drawings of bulk and reticulation infrastructure
- No pressure management
- Poor asset register
- No Active leakage control being undertaken
- Very little or no school and community Awareness and Education Programmes related to WC/WDM
- No use of the local media to promote WC/WDM
- No WC/WDM posters or educational material available

Recommended Projects / Interventions

There is significant scope for WC/WDM efforts within the Ilembe District Municipality. The following interventions are recommended and are listed in order of their potential to create water savings and reduce NRW within the municipality;

- Verify network Sectorisation and install / repair strategic zone management meters.
- Log flows into the zones and pressures within the zones.
- Analyse pressure and flow data and identify areas of high losses and areas of high pressures.

- Service and set all control valves within the network.
- Plan, design, construct and commission pressure reducing installations where required.
- Implement active leak detection and repair exercises within high water loss zones.
- Plan, design and construct bulk water meters where required (check meters).
- Develop a Water Balance to IWA adopted standards.
- Develop a WDM section consisting of two staff members. Candidates for these positions will require significant capacity building and training. It is recommended that the training is achieved by involving them in the implementation of the above-mentioned tasks by a suitably qualified specialist WC/WDM consulting firm.
- Develop a planned maintenance programme. The municipality should dedicate 2% of the capital value of its water related infrastructure to the planned maintenance of this infrastructure annually.
- Develop a water infrastructure asset register detailing all water infrastructure including the following;
  - Water treatment works
  - Reservoirs and storage tanks
  - Pump stations
  - Bulk mains
  - Reticulation network
  - Bulk and management meters
  - Control Valves
- Develop a Customer Care section to tackle social issues such as;
  - The conducting of Community and School Education and awareness programmes relating to WC/WDM.
  - Promotion of the importance of WC/WDM in the local press and on local Radio Stations
  - Procurement and development of educational material in several languages that promote WC/WDM

The complete scorecard for iLembe is included in **Appendix C**.

2.4 WATER SAVING SCENARIOS

2.4.1 Introduction

In order to evaluate the potential savings that can be achieved through WC/WDM measures, the project team developed three scenarios, which were provided to the planning team for use in the subsequent system analyses. The three scenarios are labelled Scenario 1, Scenario 2 and Scenario 3 and they are based on the following:

Scenario 1: Reduction in wastage over 5 years

- Water losses can be controlled within the next 5 years (2005 to 2010) and maintained afterwards.
- Very limited water use efficiency is introduced.

This scenario assumes that certain actions can be implemented over a period of 5 years after which the capital costs will decrease and only maintenance costs will remain. This scenario addresses only reduction in wastage with very limited introduction of water use efficiency.

Scenario 2: 5 Years water loss programme and efficiency

- Water losses can be controlled within the next 5 years (2005 to 2010) and maintained afterwards.
- Water use efficiency is implemented by targeting the billed consumption. It was assumed that a 1% per annum efficiency can be gained from 2015 increasing to approximately 25% in the year 2025.

This scenario is the most optimistic with regard to the savings that can be achieved and involves both savings from the Non-Revenue Water as well as savings from the Revenue Water, which are assumed to take place over 5 years and 10 years respectively.

The savings from the Non-revenue water concentrate on issues such as leakage detection and repair in areas where consumers have high levels of payment and any losses after the customer meter are basically considered to be part of the customer demand – normally these losses are relatively small since the customer will identify any household leakage and repair the leaks quickly. In the case of areas where the level of payment is very low or is based on a “lump-sum” tariff, the losses tend to be greatest inside the properties after the consumer meter. In many cases, no accounts are sent to the consumers or the accounts are so high that they are generally ignored and payment will never be received by the Municipality. In such areas, the general monthly water

demand per property (assuming that there is full 24-hour supply) is usually between 35 m^3/month and 55 m^3/month. If the water use can be controlled in some manner through proper metering with billing and cost recovery (often using pre-paid meters etc), the water demand tends to drop to approximately 10 m^3/month. In many cases, the revenue generated from the water sales is insufficient to justify the expense of metering and billing, however, the real saving to the municipality can be in the order of 40 m^3/month, which is often sufficient to justify major investment.

In the medium and high-income areas, the main WC/WDM measures that can be used to reduce wastage (reduction in customer demand is not considered at this stage) concentrate on the reduction in losses from physical leakage before the customer meter. In these areas, most of the water supplied to consumers is both metered and paid for by the consumer and therefore wastage inside the properties tends to be relatively small, and in no way parallels the extent of the problem as it exists in many of the low income areas. Although the physical leakage is considered to be the main problem in the middle and high income areas, the levels of leakage tend to be relatively small compared to the levels experienced in the low income areas and therefore the potential savings that can be achieved are also small.

This scenario is potentially problematic for the water utilities since their capital costs and much of their operational costs are fixed, while the income is dependant on the water sales. To reduce the overall demand can cause problems to the financial viability of a water utility.

In Scenario 2, it was also assumed that some savings could be achieved through more efficient water practices inside the properties. This typically involves the use of water efficient appliances (washing machines, toilet cisterns etc) as well as low flow shower heads and water efficient gardens where irrigation is either not required or significantly reduced. Typical example of a water efficient garden is shown in **Figure 2.22.**



Figure 2.22: Water efficient garden

Scenario 3: Reduction in wastage over 10 years

- Water losses can be controlled within the next 10 years (2005 to 2010) and maintained afterwards.
- No water use efficiency is introduced.

Scenario 3 is basically the same as Scenario 1 and only addresses the reduction in wastage. This scenario, however, assumes that certain actions can only be implemented over a period of 10 years, which is considered more realistic than Scenario 1, based on practical experience gained by the project team from many WC/WDM projects. This is a more favourable and realistic scenario than either of the two previous scenarios.;

2.4.2 Methodology

In order to make a proper assessment of the potentials savings that can be achieved it was first necessary to obtain basic information for each management area. The basic information was captured in spreadsheets and used in the water balance and potential savings analyses.

The basic information was used to calculate a water balance for key demand centre as previously discussed. The water balance provides an indication of the possible savings that could be achieved through physical leakage and billed but not paid for consumption.

A key objective of the WC/WDM task was to estimate the potential savings that can be achieved through a range of WC/WDM interventions. In order to address this objective a methodology was developed to determine realistic water uses for the various areas based on the number of properties being served. Combining this realistic use with the actual bulk system input volumes; it was possible to estimate approximate savings that each WSA could expect should they attempt certain water demand management interventions. **Figure 2.23** presents the approach used to calculate the potential water savings in the study area.

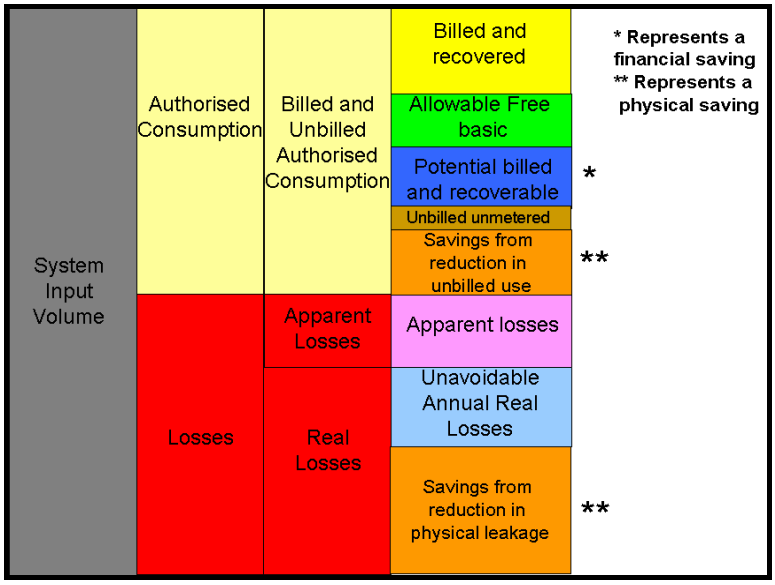


Figure 2.23: Breakdown of system input volume for estimating potential savings

The figures show that the greatest contribution to non-revenue water in medium to high income areas lies with real losses, (i.e. physical leakage) while for low income areas the greatest contribution to the non-revenue water originates from authorised consumption that is not paid for. This does not imply that the actual volumes of real losses are higher in medium to high income areas since the overall level of non-revenue water in such areas is likely to be much lower.

The descriptions for each component of the water balance are as follows:

Billed and recovered: this represents the volume of water that is billed and paid for. It does not include the free basic allowance.

Allowable free basic: This represents the free allowance of 6 kℓ/property per month and can technically be considered as billed water which is billed at a zero rate. This component cannot be reduced.

Potential billed and recoverable: This is a volume of water that is currently either metered or unmetered, however, the customer is not billed and therefore does not pay. This represents water that will be paid for by the consumer if the water supplier is able to address the non-billing issues.

Unbilled Unmetered: This is normally a very small component of the water supplied to an area and there is generally little to be saved from this component since there is already a policy in place to ensure that all connections are metered. This component represents mainly the water used for fire fighting and mains flushing.

Savings in reductions in unbilled use: This is one of the components where most savings can be achieved in many of the water systems analysed in the study area. It is made up of consumers who are currently billed but do not pay, as well as water users who are not billed at all. A realistic volume of use per household is approximately 12 kℓ / month in most low-income areas. This includes the 6 kℓ that are provided free. It is likely that WSA's that implement an effective payment system for use above the allowable free limit will achieve significant savings as a result of a drop in use as well as wastage from internal plumbing leaks.

Apparent losses: The apparent losses were based on an assessment of the levels of illegal connections in the system as well as the age of the meters and quality of the water. This approach is subjective to some extent and dependant on the in-depth knowledge of the system by the manager who completed the water audit.

UARL: This volume of water is calculated from the standard UARL equation and is a function of length of mains, number of service connections and average operating pressure.

Savings from reductions in Physical Leakage: This can represent a sizeable component of the overall water balance in areas where maintenance of the water reticulation system has been neglected due to lack of financial resources or technical capacity. In most of the well established municipalities, the water distribution systems are in relatively good condition and leakage is addressed as a matter of priority. Leakage does occur in many of the low income areas where maintenance of the water reticulation system has been neglected for various reasons over a prolonged period. In general, the levels of physical leakage (real losses) in most of the large water supply systems in the country are not considered to be abnormally high. A few pockets of very high physical leakage do exist, however, these areas are being addressed as a matter of priority. **Physical leakage is not the main problem issue facing most of the water suppliers in the study area.**

The potential saving through various interventions such as retrofitting and metering, pressure management, mains replacement and active leakage control can be calculated using case studies and internationally accepted standards. The assumptions made are summarised in **Table 2.3**.

Table 2.3: Summary of savings through various interventions

Intervention	Potential saving	Comments
Pressure management	Reducing the estimated minimum night flow by 25% for the area	The minimum night flow is based on actual or extrapolated logging results. Where no logging results exist, it was assumed that the minimum night flow is 50% of the average flow.
Mains replacement	200ℓ/km/hr	An average of 200ℓ/km/hr can be saved through mains replacement.
Active and passive leakage control	Estimated 1leak/km/annum running at 1.6m^3/hr for one week	
Retrofitting	2 to 15kℓ/property/month with exceptional cases like Soweto where up to 50kℓ/property/month is saved.	These assumptions are based on the Leakage Reduction Projects undertaken by Rand Water (Rand Water, 2002) which indicated an average of 3 to 20m^3/property/month can be saved through retrofitting.
Sectorisation, water balance,	1 to 5% reduction in overall consumption.	

The potential savings calculated from the water balance are then compared to the potential savings that can be achieved through various interventions. In each case, these two values should be close in order to establish a realistic potential saving. This methodology is shown in **Figure 2.24.**

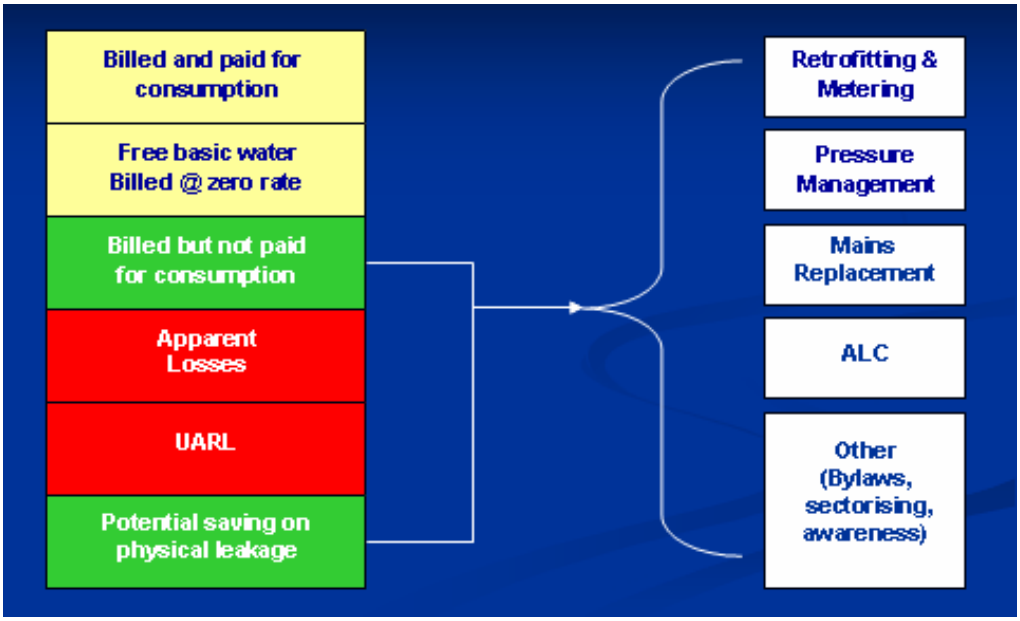


Figure 2.24: Potential savings methodology

The assumptions made in assessing the potential costs are summarised in **Table 2.4.** They are based on the volume of water saved through the various interventions as previously discussed.

Table 2.4: Summary of WC/WDM costs

Intervention	Budget	Costs
Sectorisation	CAPEX	Establishment R 20 000 / zone
	OPEX	Maintenance at R 5 000 /zone
Pressure management	CAPEX	Actual costs or best estimate
	OPEX	R 5000 / control valve / annum
Mains replacement	CAPEX	Replace 2% / annum @ R 150 /m
Active and passive leakage control	OPEX	R 1500 / km
Retrofitting & removal of wasteful devices	CAPEX	5% of properties @ R 1000 / property
Meter reading, billing & cost recovery	CAPEX	Consumer meter audit @ R 50 / meter
	OPEX	Monthly meter reading @ R 5 / meter
Education and awareness campaigns	OPEX	R 5 / consumer / month
Water audits / manage KPI's	OPEX	R 1500 / zone / month
Management meters	CAPEX	New meters @ R 50 000 / meter
	OPEX	Replace 10% / annum @ R 5 000 / meter
Consumer meters	CAPEX	New meters @ R 1000 / meter
	OPEX	Replace 10% / annum @ R 500 / meter

2.4.3 Results

eThekwini Metropolitan Municipality

The potential savings and cost analysis for eThekwini are summarised in **Tables 2.5** and **2.6** and **Figure 2.25.** Detailed summaries for the potential savings are included in **Appendix A**.

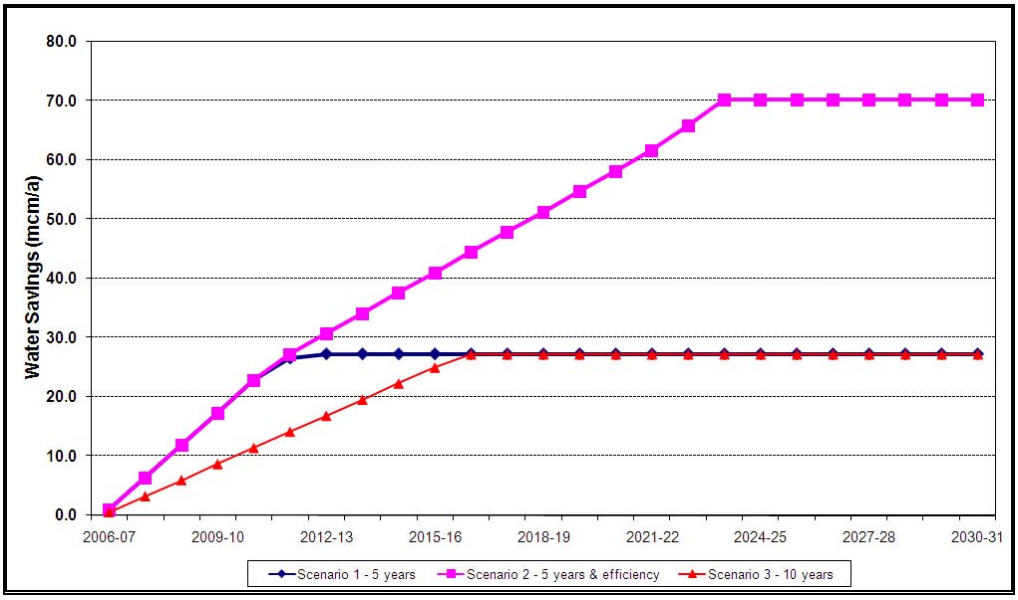


Figure 2.25: eThekwini estimated water savings

Figure 2.25 shows the potential savings from the 3 scenarios. Scenarios 1 and 3 achieve the same savings but over 5 and 10 years respectively. With Scenario 2 the water losses are eliminated over 5 years after which the additional savings are achieved through water use efficiency.

Table 2.5: eThekwini summary of key performance indicators

KPI	Current	Target – 5 Years	Target – 5 Years with efficiency	Target – 10 Years
ℓ / capita / day	262	240	203	240
m^3 / property /day	31	29	24	29
% non revenue	-	9%	23%	9%
ILI	3.8	2.0	2.0	2.0

Table 2.6: eThekwini cost analysis

NPV @ 8% over 45 years	Scenario 1 – 5 years	Scenario 2 – 5 years with efficiency	Scenario 3 – 10 years
CAPEX (Rand)	622.9	626.9	548.4
OPEX (Rand)	920.2	1 265.2	920.2
TOTAL (Rand)	**1 543.1**	**1 892.1**	**1 468.6**
Savings (m^3)	413.7	867.1	345.5
Average URV (R/m^3)	**3.73**	**2.18**	**4.25**
Reduced Payment (Rand)	860.8	1 545.4	719.4
Additional Income (Rand)	808.8	760.4	634.3

The results from Scenarios 1 and 3 indicate a total reduction in demand of approximately 9% or 27.2 million m^3/annum by year 2025 by just reducing the real losses and introducing very limited efficiency. This reduction will reduce the average consumption per capita per day from 262 to 240l/c/d or the consumption per household from 31 to 29m^3/property/month. These results are in line with the municipality's current intervention programme, which also aims to reduce the demand by 10%. The results from this study are more conservative as the 9% is achieved through more interventions and higher budget than what the municipality is currently doing.

The results from Scenario 2 indicate a much greater reduction in demand of approximately 23% or 70 million m^3/annum by year 2025 by reducing the real losses and aggressive efficiency. This reduction will reduce the average consumption per capita per day from 262 to 203ℓ/c/d or the consumption per household from 31 to 24m^3/property/month.

Based on the cost analysis it is clear that there is some benefit in implementing WC/WDM as the input can be offset against the reduction bulk purchases. If the municipality can get the consumers to reduce their consumption, the benefits can be even greater.

It should be noted that the Unit Reference Values (URV) provided is an average of all the interventions. In order to address leakage/wastage of water in an area, there are many Water Demand Management (WDM) interventions that can be considered. Each area has its own unique problems although the main underlying issues are often similar. Before deciding on how to address the problems, it is first necessary to understand them and then decide on the intervention that will provide the biggest cost benefit or lowest URV value.

Msunduzi Local Municipality

The potential savings and cost analysis for Msunduzi is summarised in **Tables 2.7 and 2.8 and Figures 2.26.** Detailed summaries for the potential savings are included in **Appendix B**.

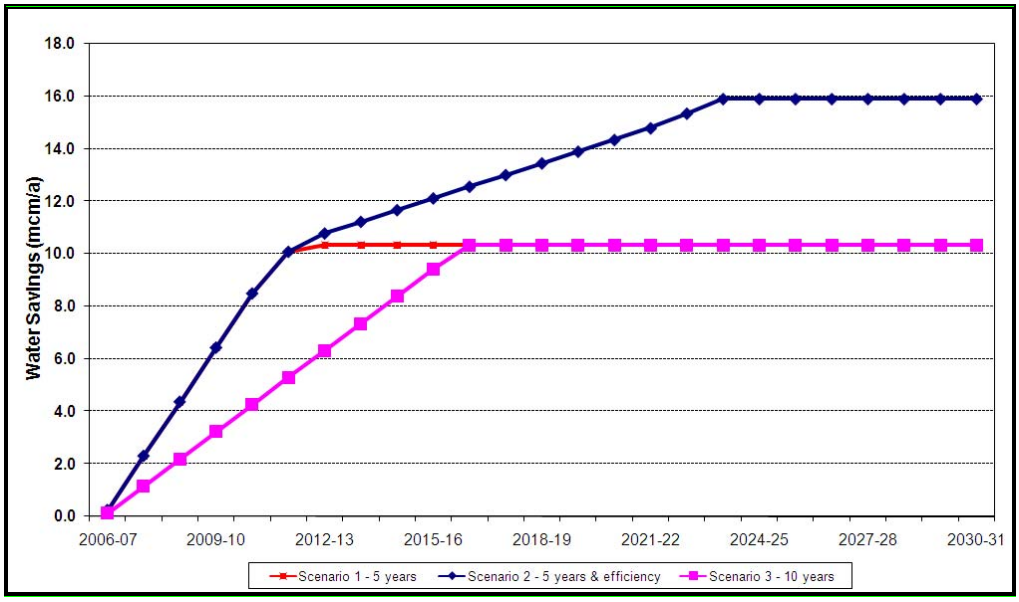


Figure 2.26: Msunduzi total potential savings

Table 2.7: Msunduzi summary of key performance indicators

KPI	Current	Target – 5 Years	Target – 5 Years with efficiency	Target – 10 Years
ℓ / capita / day	361	290	251	290
m^3 / property /day	46	37	32	37
% non revenue		20%	31%	20%
ILI	8.9	2.0	2.0	2.0

Table 2.8: Msunduzi cost analysis

NPV @ 8% over 45 years	Scenario 1	Scenario 2	Scenario 3
CAPEX (Rand)	101.5	101.5	90.1
OPEX (Rand)	105.4	150.7	105.4
TOTAL (Rand)	**206.9**	**252.2**	**195.4**
Savings (m^3)	161.8	220.6	144.1
Average URV (R/m^3)	**1.28**	**1.14**	**1.36**
Reduced Payment (Rand)	324.6	413.3	271.3
Additional Income (Rand)	348.5	348.5	321.8

The results for Msunduzi for Scenarios 1 and 3 indicate a total reduction in demand of approximately 15% or 10.3million m^3/annum by year 2025. This reduction will reduce the average consumption per capita per day from 330 to 290l/c/d or the consumption per household from 46 to 37m^3/property/month.

The results from Scenario 2 indicate a much greater reduction in demand of approximately 31% or 16 million m^3/annum by year 2025 by reducing the real losses and aggressive efficiency. This reduction will reduce the average consumption per capita per day from 262 to 251ℓ/c/d or the consumption per household from 46 to 32m^3/property/month.

Although the average consumption per capita is still very high despite the potential savings, it would be unrealistic to expect a 50% reduction in demand to bring it in line with international standards.

iLembe District Municipality

No detailed analyses were undertaken for Siza Water and KwaDukuza. Based on the water balance there is limited scope for reducing real losses in Siza Water. The objective in this area would be to enforce efficiency and reduce customer demand. This can be achieved through tariff increases and consumer awareness.

Although initial indication are that the water losses in KwaDukuza (Stanger) are under control (KZN North Coast WC/WDM study, 2004 and interviews) and to a large extent controlled by the capacity of the KwaDukuza WTW, this assessment is based on perceptions and reliable data is required to quantify these results. It is expected that should the capacity increase, the losses will increase and the municipality should embark on an extensive WC/WDM programme.

3 INDUSTRIAL MINING POWER SECTOR

3.1 INTRODUCTION

The industrial demand discussed in this section was completed by members of the project team under the appointment : Assessment of potential water conservation / water demand management strategies in the Mvoti to Mzimkulu WMA, and revised for the purposes of this study.

Information was requested from Water Service Providers (WSP's) and Water Services Authorities (WSA's). Industry within the study area consists of a variety of different sub-sectors including:

- Metal products
- Machinery
- Basic steel and non-ferrous
- Vehicle Manufacture
- Food and Beverage
- Fuel (Refinery)
- Pulp and Paper
- Sugar
- Textile and Clothing

3.2 STATUS QUO ASSESSMENT

3.2.1 Msunduzi Local Municipality

The Msunduzi Local Municipality provided the consumption data for all non-domestic consumers for the period October 2003 to June 2007. For the purposes of the study, the information has been incorporated, even though the information includes industrial, commercial and government consumers.

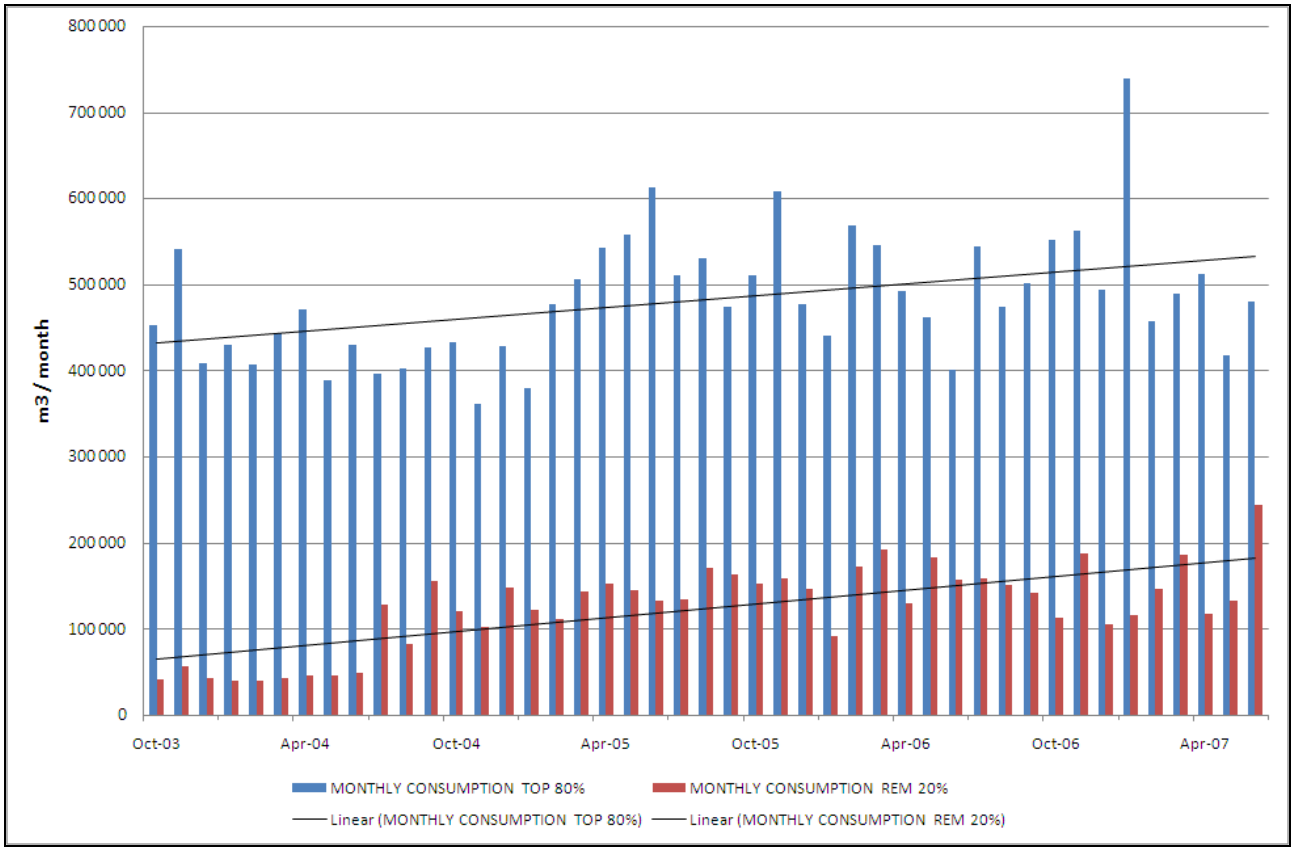


Figure 3.1: Non-Domestic Consumption (80/20)

The average growth in demand, for the Msunduzi Local Municipality non-domestic consumers, in the period July 2004 to June 2007 was 6.7% per annum.

It should be noted that the top 80% (by volume) of the Msunduzi Local Municipality non-domestic consumers account for only 228 (14%) of the 1573 (86%) consumers. This exercise of separating the top 80% serves to illustrate that by successfully targeting a selected, but smaller number of consumers, significant success in WC/WDM can be achieved.

The average growth in demand for the Msunduzi Local Municipality top 80% non-domestic consumers (by consumption) for the period July 2004 to June 2007 was 6.2% per annum.

The average growth in demand for the Msunduzi Local Municipality's remaining 20% non-domestic consumers (by consumption) for the period July 2004 to June 2007 was 8.6% per annum. The annual growth in consumption from smaller consumers is therefore greater than that of the larger consumers. These small to medium sized industries are less likely to be impacted upon by local and national government initiatives relating to WC/WDM. The major driver regarding water use for

these consumers is therefore the cost. The growth in demand in this sector requires however, that effective means of implementing water conservation and water demand management are identified and undertaken.

3.2.2 eThekwini Municipality

The number of non-domestic consumers supplied by the eThekwini Municipality is significantly large (16 484 consumers). The eThekwini Municipality was only able to provide detailed monthly consumption information for the top 100 consumers. This consumption information is represented graphically below.

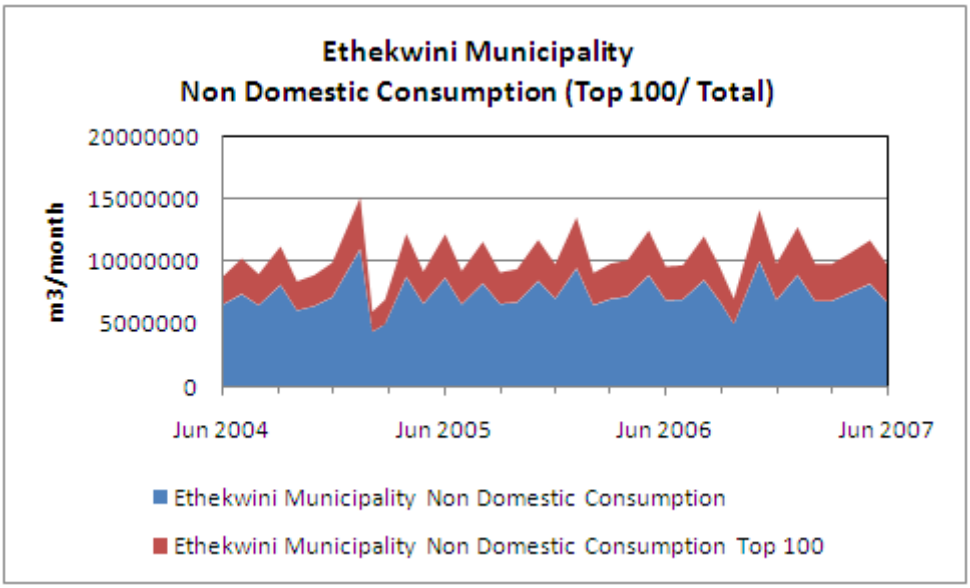
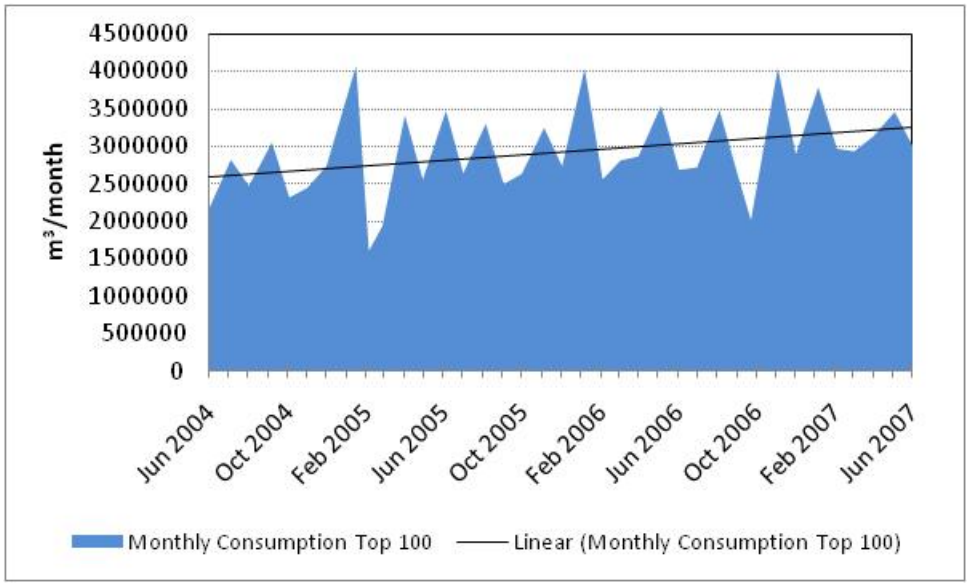


Figure 3.2: Non Domestic Consumption (Top 100 Consumers)

The average growth for the eThekwini Municipality's non-domestic consumers was 2.5% per annum for the last three years. The graph above illustrates the consumption of the Top 100 consumers which amounts to 40% of the total non domestic consumption, versus the remaining 16 384 non-domestic consumers who therefore account for 60% of the non domestic consumption. These consumers must therefore be prioritised when developing water conservation and water demand management strategies for the industrial sector.



The average growth for the Top 100 non-domestic consumers was 8.0% per annum for the last three years. This significant growth highlights the need for the implementation of measures to ensure the sustainability of the water resource within this area.

The monthly consumption for textile and remaining industrial consumers have been separated for analysis purposes.

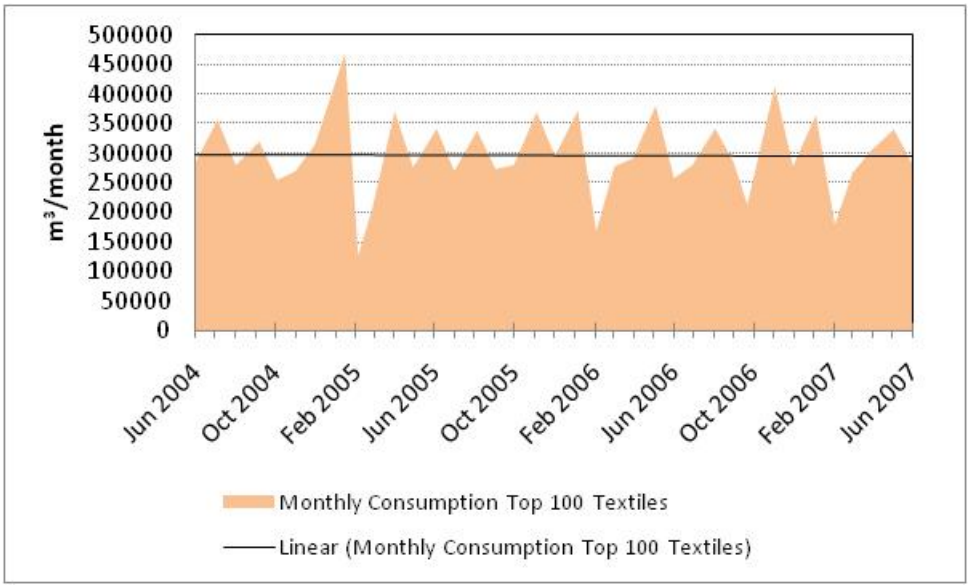


Figure 3.3: Non-Domestic Consumption (Textiles from Top 100)

The average growth for the textile industry (from Top 100 non-domestic consumers) was 0.0% per annum for the last three years. Due to the recent removal of protection from imports previously enjoyed by this sector, this industry has come under tremendous pressure to become more competitive in the international market. This has also been an important driver for improved efficiencies in production including the areas of water and effluent.

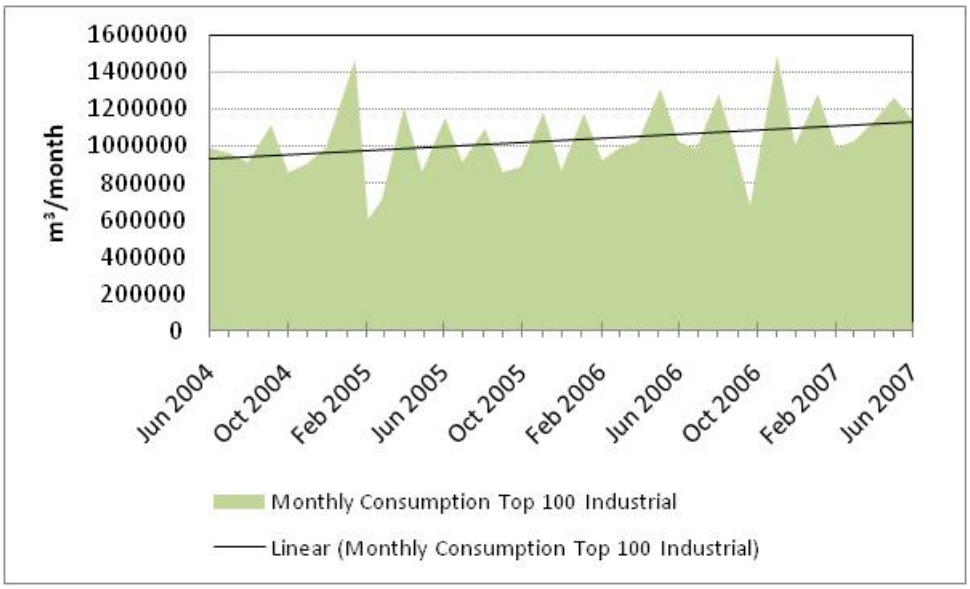


Figure 3.4: Non-Domestic Consumption (Industrial)

The average growth for the remaining industry (from Top 100 non-domestic consumers) was 6.4% per annum for the last three years. The positive economic climate with significant growth within most sectors is likely to have had an impact on water consumption as many industries increase output. The challenge is to ensure that this growth is sustainable and that a portion of the increase in water demand is offset by improvement in efficiencies.

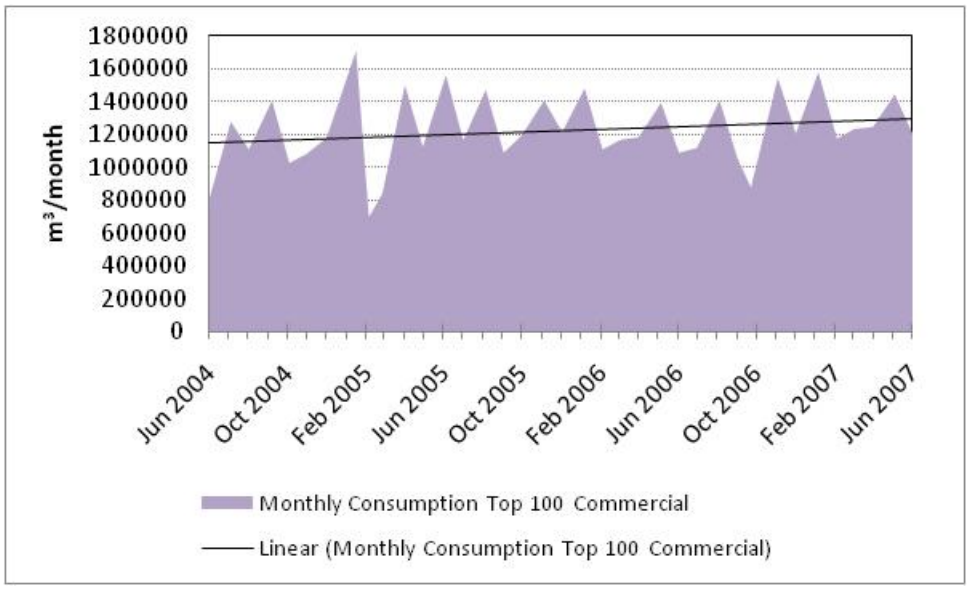


Figure 3.5: Non-Domestic Consumption (Commercial)

The average growth for the remaining industry (from Top 100 non-domestic consumers) was 4.6% per annum for the last three years. The positive economic climate in South Africa over the three-year period is also likely to have an impact on the water consumption for the commercial sector.

The eThekwini Municipality Water and Sanitation Department requires industries to apply and periodically renew Sewage Disposal Bylaws Permits. Water use as part of a Water Balance Questionnaire forms part of this application. As is the practice amongst most municipalities, consideration is given to water consumption when determining effluent charges. High losses or inefficient use will therefore impact negatively on the industries overheads for both water and effluent.

3.3 METERING OF INDUSTRIAL CONSUMERS

Water metering in industrial areas is an extremely important asset to municipalities. Although domestic metering, reading and billing should also not be neglected, high consumption amongst industry equates to significant revenue for the municipality if the consumption is accurately metered, the meters are read frequently and correctly and, the consumer is billed. Industries which are under billed or have un-metered consumption are also less likely to implement measures to prioritise water efficiency within their operations. Older meters will tend to become less accurate

due to wear at the expense of the municipality. Periodic meter audits and replacement programmes are therefore required for all industrial areas.

A number of bulk consumer meter investigations and meter replacement programmes are being carried out as part of the implementation phase of Water Demand Management Strategies for Municipalities. These investigations focus on industrial areas and top consumers for the various municipalities. These initiatives can have a significant impact in addressing high levels of un-accounted for water in such areas. Sources of losses related to bulk consumer metering include:

- Un-metered connections (e.g. fire connections)
- Inaccurate measurement due to:
    - Incorrect meter installations
    - No strainers to protect meters from damage due to foreign articles in the pipe
    - Insufficient straight length
    - Incorrect meter alignment
    - Incorrect meter type
    - Incorrect meter size
    - Meter wear
    - Incorrect meter readings

The following process is then carried out with the objective of minimising such losses:

- A comprehensive investigation of all bulk consumer meters
- Location and assessment of un-metered connections
- Replacement of inaccurate/ non functioning meters
- Installation of meters on un-metered connections

Bulk Consumer Meter Replacement Programmes and Bulk Consumer Meter Audits have been undertaken by the eThekwini Water and Sanitation Department in industrial areas with positive results. The Msunduzi Local Municipality who are encountering capacity problems within the water and sanitation department are currently replacing water meters as required with no existing bulk water meter replacement programme.

3.4 CLEANER PRODUCTION

Following interviews with various stakeholders carried out during the course of the study, it became apparent that while Cleaner Production is well known in certain industrial and government sectors there is little or no knowledge of the initiative. Due to the increasing success and importance placed on Cleaner Production by key stakeholders including Water Efficiency Specialists in the Industrial Sector, effort was made during the course of the study to determine the status and possible potential of Cleaner Production with respect to Water Conservation and Water Demand Management.

National Cleaner Production Centre (NCPC)

The National Cleaner Production Centre (NCPC), an organisation that falls under the control of the Department of Trade and Industry (DTI), was established in 2002. Cleaner Production as an approach to production within industry has however been undertaken through various initiatives in South Africa for some time.

Background

The following excerpt is taken from the National Cleaner Production Strategy (2004):

Cleaner Production (CP) describes a preventive environmental approach, aimed at increasing resource efficiency and reducing the generation of pollution and waste at source, rather than addressing and mitigating just the symptoms by only technically “treating” an existing waste /pollution problem. In essence, Cleaner Production is about:

- Preventing waste and pollution at source
- Minimising the use of hazardous raw materials
- Improving water and energy efficiency
- Reducing risks to human health
- Saving money

The NCPC head office is based at the CSIR's Process Technology Centre in Pretoria. The NCPC conducts in-plant assessments and training programmes, promotes investment in cleaner technology and provides policy advice and information.

Current Status

A meeting was held with Mr Ndivhuho Raphulu, the Director of the South African National Cleaner Production Centre based at the CSIR in Pretoria in order to gain an overview of the current status of Cleaner Production in South Africa. The information provided by Mr Raphulu can be summarised as follows:

Cleaner Production focus areas are:

- Water (potable and effluent)
- Energy
- Material

In South Africa the main focus areas are water and material as Eskom currently handles the aspects relating to energy efficiency (Demand Side Management). The industrial sectors currently being targeted are:

- Automotive
- Chemical
- Agro processing (includes Sugar)
- Clothing and Textiles
- Mining is to be included in 2008

Eighteen companies per sector are identified each year by the NCPC. Sufficient funding is provided by the Department of Trade and Industry (DTI) to carry out the assessment of each company. The companies are normally required to fund 50% of the costs to implement the recommendations of the assessment. Funding is also obtained from the various chambers within the DTI as well as the Department of Environmental Affairs and Tourism (DEAT). International funding is obtained from the Danish Ministry of Foreign Affairs (DANIDA) as well as the United Nations Industrial Development Organisation (UNIDO) and United Nations Environmental Programme (UNEP). Cleaner Production is driven internationally by the UNIDO and UNEP policies.

There are in excess of 200 Cleaner Production Centres internationally. These Cleaner Production Centres partner on various Cleaner Production projects around the world. The South African National Cleaner Production centre has an advisory board which includes specialists in various fields. Four South African Professors are funded by UNIDO and UNEP as specialist consultants for the various Cleaner Production projects both locally and internationally.

In 2005, the NCPC established a Cleaner Production consultant database. One of the aims of the NCPC is the developing of Cleaner Production capacity, by using consultants to carry out Cleaner Production work within companies. The database forms the basis from which consultants can be selected for specific tasks according to their expertise. Ongoing training initiatives are also carried out by the NCPC on Cleaner Production to create awareness and build capacity in Cleaner Production.

The NCPC has created a repository in the form of an on-line database which includes Case Studies and Benchmarks for the various projects completed to date in the various sectors. This type of resource centre is to be created for each province by March 2008. Information pertaining to Textiles is currently available which includes case studies, national and local laws that require compliance from industry and requirements for ISO 14000 certification.

Numerous programs, most of which are ongoing, have been initiated to date by the NCPC including:

- Waste Minimisation Clubs
- Cleaner Metal Finishing Project
- The Cleaner Textile Production Project (Life Cycle Approach)
- Ecolabelling

Additional information relating to these and other programmes can be obtained at www.ncpc.co.za.

Case studies

Projects recently completed include the Hammersdale Industrial Area. Considerable gains were achieved both in terms of a reduction in the environmental impact and reduced potable water purchases through installation of an effluent treatment plant and recycling of a portion of the effluent while the remainder is discharged into the municipal effluent system. Previously all effluent was discharged into the river. Other projects recently carried out with significant potential for water savings include:

- Glodina – Quick scan assessment followed by a detailed In-Plant Assessment (IPA) indicated a potential saving of R400 000 per annum through recoveries of the boiler condensate and a reduction in energy losses from the stenter.
- Coats SA – Quick scan prompted the organisation to carry out a detailed assessment focusing on cleaner production opportunities to reduce water consumption by R147 000 per annum

(19%). Further opportunities including condensate recovery and steam line insulation could result in a further saving of R61 000 per month.

- Mediterranean Textiles – Potential opportunities highlighted by a quick scan suggest a 15% reduction in water consumption at a calculated cost (including raw water and effluent) of approximately R 302 000.

3.5 POTENTIAL ASSESSMENT

3.5.1 eThekwini and Msunduzi Municipalities

The average consumption (**Figure 3.9**) for the industrial sector is 14% of the total average daily demand. As the key area with the highest non-domestic and domestic consumption, the potential for water conservation and water demand management is significant.

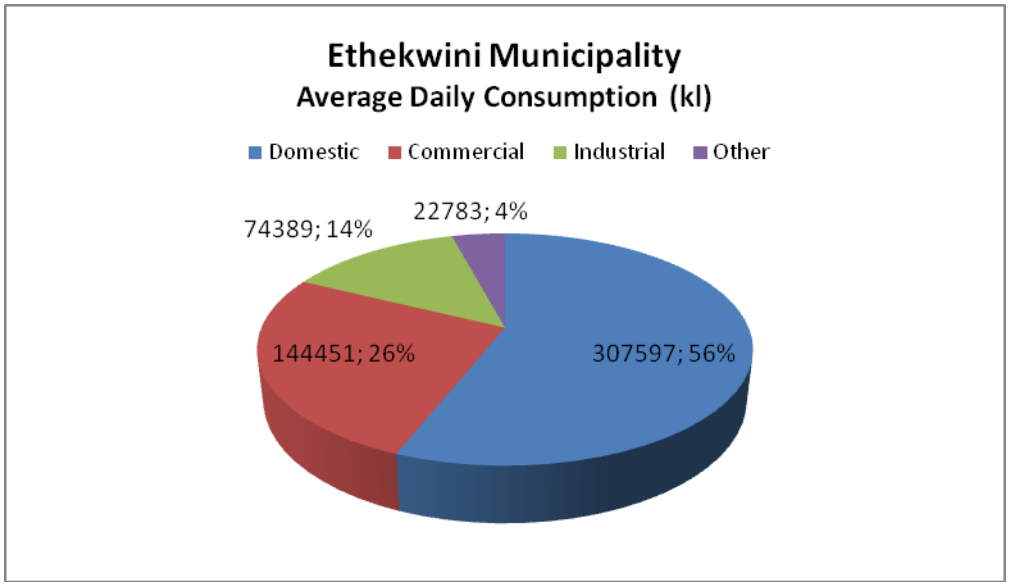


Figure 3.6: eThekwini Municipality – Average Daily Demand

The non-domestic consumption figures for the eThekwini and Msunduzi Municipalities for the last year (June 2006 – July 2007) can be summarised as follows:

Table 3.1: Summary of Municipal Non-Domestic Demand

Municipality	Sector	Average Daily Demand (m^3)	Annual Demand (m^3)
eThekwini	Commercial	147 733	53 922 391
	Industrial	74 216	27 088 872
	Other	22 571	8 238 402
eThekwini - total		**244 520**	**89 249 664**
*Msunduzi		21 973	8 020 017
Total		**266 493**	**97 269 681**

*Non-domestic consumption data is not available per sector for the Msunduzi Local Municipality

By using the current annual increase in demand, the predicted consumption for the next five years is illustrated graphically below. The objective of improving water efficiencies in the industrial sector must have a sustainable impact on this trend in such a way as not to impact negatively on economic growth within the sector.

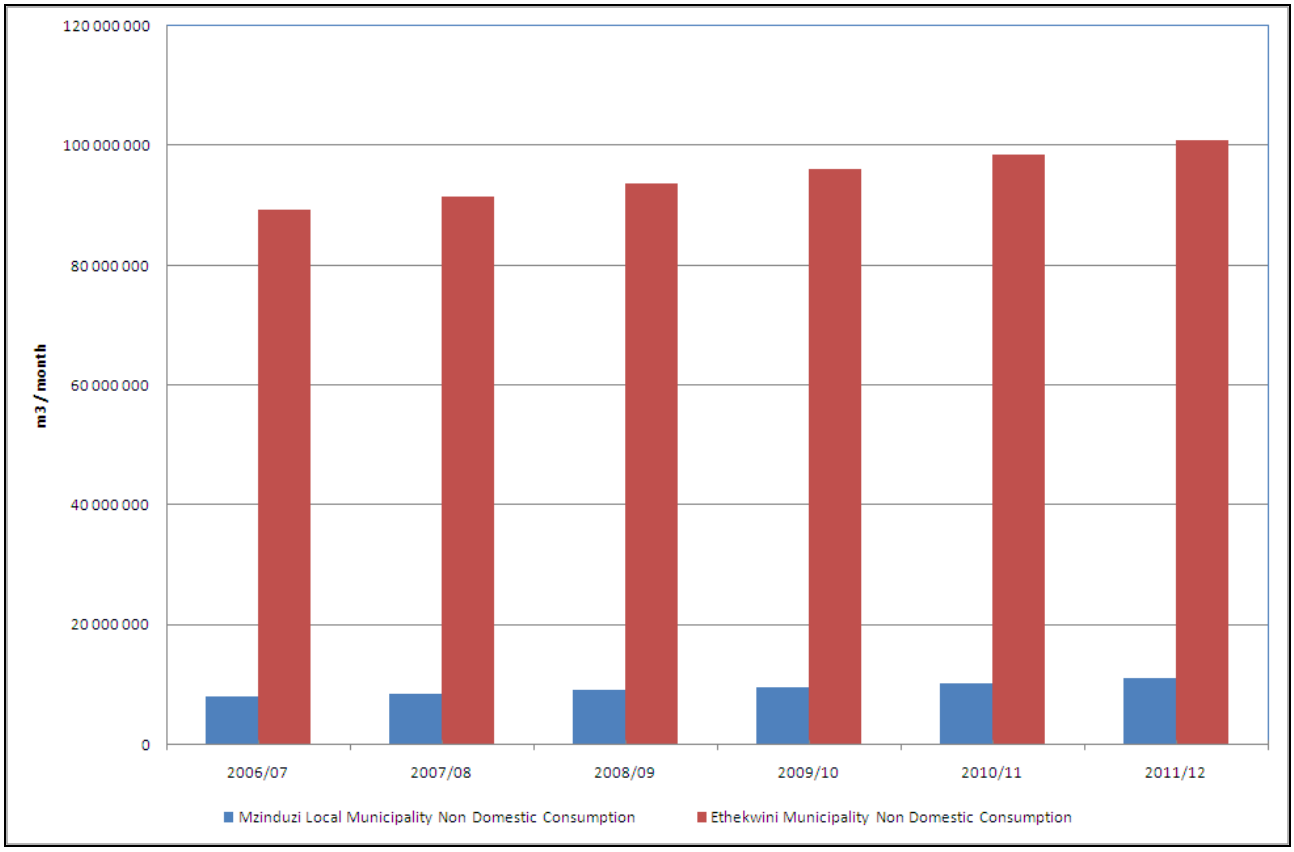


Figure 3.7: eThekwini and Msunduzi Municipalities – Predicted Non Domestic Demand

3.6 INDUSTRIAL CONSUMERS

The status and potential for WC/WDM for the various industry sectors are summarised as follows:

Vehicle Manufacture

Status

- There is a significant growth in consumption for the consumer due to an increase in capacity (30%)
- The consumer has an existing water balance/ water management system which is improving
- ISO 14001 audits are carried out every 6 months
- The organisation benefits from adequate resources and adherence to international standards (including ISO 14000) as part of an international group

Potential

- Benchmark information indicates that there is potential for improvement in two of the four major process areas.
- The lack of a formal strategy indicates that more emphasis should be placed on water efficiency for future planning initiatives.

Food and Beverage

Status

- The average annual increase in consumption (12.2%) to date can be attributed to an increase on production. Specific water use per volume of product produced has decreased by an average of 1.2 percent. A further decrease of 1.3% per annum is predicted for the next five years
- A comprehensive water management system is in place with daily meter reading and water use targets per department
- Formal Strategy and current initiatives indicate water efficiency is prioritised (water is the main raw material for the product!)
- Annual benchmark information indicates that the consumer is actively working to achieve a reduction in specific water consumption per volume of product produced on an ongoing basis

Potential

- Target (Benchmark) for usage for 2007 will require a reduction in usage per Hℓ beer produced to achieve target.

- A detailed audit of the current water use practices in the plant could identify further potential

Pulp and Paper

Status

- Historical and predicted consumption figures provided by the consumer suggest a constant demand in line with the water use agreement
- Monthly consumption is monitored by DWAF
- Formal Strategy (IWMP) and current initiatives indicate water efficiency is prioritised

Potential

- As a significantly large consumer, potential in a number of areas exists which is currently being explored
- Benefits of further improvements in efficiency that have a positive impact on effluent volumes and quality should be prioritised

Sugar

Status

- Following an overall decrease in average annual consumption of potable and non potable water for the last five years (10.2%), the consumer does not predict further increases in the next five years.
- A number of water demand and loss management initiatives (some of which have required significant investment) are ongoing
- A formal strategy is in place

Potential

- Use of benchmarking information should be encouraged in order to set annual specific water use targets within the groups
- A water management system with process metering should be implemented for water balance purposes
- Further potential savings are likely to be identified through a detailed audit of current water use practices in the plant

Textile and Clothing

Status

- There has been an average annual increase in consumption (17.2%)
- Consumption is monitored for four major use areas and meters are read monthly
- Maintenance of the water system is ongoing
- No formal strategy exists

Potential

- Education programs after induction training would be beneficial in sustaining good water use practices within the plant
- The lack of formal WC/WDM strategy and predicted water consumption figures indicates that more emphasis should be placed on water efficiency
- An external audit undertaken by specialists from the textile industry could identify further re-use and recycling potential

3.6.1 Large versus Small to Medium Sized Companies

Large Companies

As discussed earlier, the large industries within the Key Areas, although significantly outnumbered by the medium and small industries, account for the majority of water consumption. The cost of water purchased as well as effluent discharged is a significant motivating factor to implement water conservation and water demand management initiatives. Other motivational factors include:

- Part of larger group/ multi-national
- "Group" standards / ISO 14 000 and or annual targets to meet
- Best practices / Benchmarks for specific water use are compared with other operations within the group
- More likely to have sufficient resources/ skills and to have an in-house environmental department or water expert/s
- May have raw water allocations and are therefore required to make water use license applications to DWAF

As highlighted in this report potential for improved efficiency in water usage amongst small to medium sized industries should not be ignored due to significant annual increases in demand

(Msunduzi Local Municipality). Collectively, small and medium sized industry can account for relatively large volumes of water usage and have relatively high losses or wastage. The main reasons for Small and Medium sized companies being less likely to implement water conservation and water demand management initiatives are:

- Often not part of larger group/ multi-national
- No "group" standards or annual targets to meet
- Insufficient resources/ skills to have a in-house environmental department or water expert
- Often not using raw water and therefore not required to make water use license applications
- Not ISO 14001 compliant (little or no monitoring and control)

Factors that are likely to motivate Small and Medium sized industries to implement water conservation and water demand management initiatives are:

- Access to information (Case Studies applicable to their type of industry)
- Access to experts who can provide advice/ carry out water audits
- Financial incentives (i.e. Eskom's Demand Side Management Initiative – 50% funded)
- Education and Awareness Campaigns (Municipalities can provide workshops, information with the water bill, DWAF Roadshows)

3.6.2 Cleaner Production

Due to the often complex processes used in the varied types of industry in the key study areas, it is often impossible to attempt to address aspects of water efficiency without addressing materials and energy as well. It also is not uncommon for efforts to improve efficiencies in one area to have a detrimental impact on another. By addressing water efficiencies as part of the Cleaner Production approach to industry, all input (water, materials and energy) and output issues (including effluent) can be addressed collectively. The National Cleaner Production Centre (NCPC) in South Africa is well established and the potential to expand the number of industrial sectors targeted should be investigated. The most significant limitations to expanding the work done by the NCPC are currently capacity in terms of expertise in CP and financial resources. The potential for reduction in water usage by industries recently assessed by the NCPC suggest significant savings of 15 to 19 % with substantial associated financial savings. These savings are an addition to those that may be achieved through the concurrent implementation CP relating to increased resource use efficiency (materials) and reduction in waste and pollution.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 URBAN SECTOR

From the assessment of the scope for WC/WDM in the KZN Metropolitan Areas, several key issues were identified, from which the following conclusions and recommendations were made:

- WC/WDM can provide a significant reduction in the water demands in the area if the measures are implemented properly and maintained indefinitely. The cost of implementing WC/WDM measures is often less than the maintenance costs, which are often overlooked with the result that the WC/WDM interventions fail within a year or two of being implemented.
- The potential savings that can be achieved in the study area range from a maximum optimistic estimate of approximately 86 million m^3/annum (Scenario 2) in the year 2024 to a more conservative and possibly realistic estimate of 40 million m^3/annum (Scenarios 1 and 3).
- Although it is accepted that garden irrigation is less of a problem in KwaZulu Natal due to the high rainfall, garden irrigation using potable water is creating both supply and pressure problems. The use of hosepipes must be either banned completely in such areas or the use restricted to an hour or two every 2^{nd} day during off-peak periods. Irrigation during the hottest part of the day (from 10h00 to 18h00) should be prohibited simply on efficiency grounds.
- Government Departments must co-ordinate their efforts with regard to WC/WDM. The efforts of DWAF where the Department is spending large budgets to educate consumers on the evils of hosepipe irrigation is being undermined by the efforts of the Department of Agriculture, where it is providing free hosepipes to the same consumers to grow vegetables. Those wishing to grow vegetables in such areas should be provided with buckets or watering cans, which can still be used with good effect without causing the system the problems mentioned previously. Alternatively, roof tanks should be provided to capture rainwater, which is ideal for such irrigation.
- DWAF should encourage WDM activities – e.g. fund projects like, providing subsidies for roof tanks and low flush toilets etc. The Department should not encourage use of low quality fixtures in township retrofitting projects and should rather use the highest quality pipes, meters and fittings for poor areas since the taps and toilets in these areas experience highest use and lower quality fittings will not last.
- Lack of maintenance will result in many systems deteriorating into intermittent supply if action is not taken quickly – particularly in township systems where lack of maintenance has occurred over past 30 years.

- Municipalities should be encouraged to combine technical and financial services into a single unit – current trend of separating billing/treasury from water supply/technical is causing major problems and a proper water audit is often not possible since the split between Real and Apparent losses cannot be established with confidence.

4.2 INDUSTRIAL, MINING AND POWER SECTOR

4.3 RECOMMENDATIONS

The following recommendations for industry all key areas are as follows:

- Education and Awareness – Information regarding water conservation and water efficient practices should be readily available for industry to educate employees (most campaigns target the domestic sector);
- Bulk Consumer Meter Investigations - It is recommended that bulk consumer meter investigations be considered for industrial areas. Large consumers that are not situated within existing industrial areas should however also be included. Meter replacement programmes can then be planned and budgeted for, for areas identified as having older and non-functioning meters as well as un-metered connections (fire/ unauthorised). An added benefit of such initiatives is that the increase in water bills frequently motivates the user to identify water wastage and loss areas and reduce consumption.
- Water Balance – Large industry should be encouraged to install and monitor process meters and carry out regular water balances in order to adequately monitor consumption;
- Industrial Register – All industrial consumers should be required to register potable, non-potable use, predicted use as well as water balance and effluent information on an annual basis as part of a water management plan;
- Cleaner Production – An increase in the scope and capacity of the National Cleaner Production Centre would allow for more industries to benefit from Cleaner Production including:
- CP Assessments
- Funding to assist with the implementation of CP recommendations
- Investigations for the establishment of new waste minimisation clubs
- The CP database/ repository
- Specialist Advice on CP (and improving water efficiency)
- Up to date technology regarding process efficiencies

- Effluent Charges – Stricter control and monitoring of effluent volumes and quality and associated penalties to industries should be enforced. High effluent costs provide a strong financial incentive for industries to reduce losses and wastage and reduce pollutants
- Retrofit/ replace old and in-efficient technology - Industry should be encouraged to make use of water efficient devices for domestic usage as well as production usage. The return on investment for such technology is often sufficient motivation to retrofit the device

A detailed assessment of industries from each of the key areas, representing the relevant industrial sub-sectors is required in order to obtain reliable estimates of the savings that can be expected from the above recommendations for each key area.

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Appendix A: eThekwini Municipality

WC/WDM Scorecard

Scenario 1 – 5 year water loss without efficiency

Scenario 2 – 5 year water loss and efficiency

Scenario 3 – 10 year water loss and efficiency

Municipal Scorecard for Assessing the Potential for WC/WDM Efforts in Municipalities

Name of Municipality / Water Service Provider: eThekweni Metro

Assessment Date: 27-Jul-07

Item No.	Description	Max Points	Score	Comments
1	Development of a standard water balance	20	10	Water balance in place UAW levels > 30%
2	Pressurised water supply to all customers 100% of the time	20	20	Pressurized water supply to all customers 100% of the time
3	Residential Consumer Meter Reading	20	15	New unbilled areas recently discovered will be rectified
4	Commercial and Industrial Meter Reading	20	15	1400 fire supply connections to be metered during 2008
5	Efficient Leakage Reporting System	20	20	Telephone number is 0801313013
6	Planned Maintenance of all infrastructure - based on % of network value per annum	20	20	Allocation for planned maintenance made each year
7	Effective WC/WDM Section in Place	20	20	Dedicated section in place focusing on Demand Management
8	Sectorisation of reticulation system in place	20	15	Preliminary zones for all reservoirs have been done
9	Control and Boundary Valve Maintenance Programme	10	5	Plans in place to improve this by end 2007
10	Efficient bulk management metering system in place	10	7.5	Plans in place to improve this by end 2007
11	Efficient Zone management metering system in place	10	7.5	approx 75% of zone meters are read - plans to improve to 100%
12	As built drawings of all bulk and reticulation infrastructure	10	10	Digital copies of entire system available
13	Pressure management	10	7.5	Lots of PM has been done approx 700 PRV alarms. Active contractors
14	Asset Register	10	7.5	Work in Progress
15	Active Leakage Control	10	10	Contracted out by very pro-active programme. Visual & acoustic
16	Community Awareness and Education Programmes related to Water Conservation	10	10	Dedicated Staff run water workshops throughout the community, schools and community centres. Very pro-active ongoing programme
17	School Awareness and Education Programmes related to Water Conservation	10	10	
18	Informative Billing / Itemised Billing	10	10	Very informative billing
19	Newspaper / Radio WDM Education in Place	10	2.5	Press not used - Worst paying wards targeted by door to door knocking
20	WDM Posters and leaflets for distribution in various languages	10	10	Extensive range of educational programmes in zulu and English
	Total	**280**	**232.5**	

Potential WC/WDM Interventions Requested by the Municipality / WSA

Municipal Scorecard for Assessing the Potential for WC/WDM Efforts in Municipalities

General

Name of Municipality	**eThekwini Metro**
Staff interviewed	**Simon Scruton**

Breakdown of Items

1. Development of a standard water balance (20 Points)

WSA has developed reliable water balance and results indicate no problems with UAW at less than 20%	20
WSA has developed reliable water balance and results indicate no problems with UAW at less than 30%	15
WSA has developed reliable water balance and results indicate problems with UAW greater than 30%	10
WSA has no water balance and no obvious leakage problem	5
WSA has no water balance and has an obvious leakage problem	0

2. Pressurised water supply to all customers 100% of the time (20 Points)

WSA maintains a pressurised supply to all areas within the water distribution network all of the time at a minimum of 20m pressure	20
WSA maintains a pressurised supply to all areas within the water distribution network however pressure drops below 20m in certain areas	15
Small isolated sections of the network experience intermittent supply	10
Many sections of the network experience intermittent supply	5
The entire network experiences intermittent supply	0

3. Residential Consumer Meter Reading (20 Points)

All consumers are metered and billed monthly	20
More than 75% of consumers are metered and billed monthly	15
50 - 75% of consumers are metered and billed monthly	10
Less than 50% of consumers are metered and billed monthly	5
No meter reading or billing takes place	0

4. Commercial and Industrial Meter Reading (20 Points)

All connections to Industrial and Commercial consumers including fire supply connections are metered and accurate.	20
All connections to Industrial and Commercial consumers including fire supply connections are metered, however some meters are not functioning or inaccurate.	15
All connections to Industrial and Commercial consumers excluding fire supply connections are metered, however many meters are not functioning or inaccurate.	10
Some industrial and commercial metering takes place, however many connections are not metered and many meters are not functioning or inaccurate	5
No Industrial / Commercial metering takes place	0

5. Efficient Leakage Reporting System (20 Points)

Efficient and reactive leakage reporting system in place (telephone number is well advertised, reported leaks are dealt with within 24hr's)	20
Efficient and reactive leakage reporting system in place (telephone number is well advertised, reported leaks are dealt with within 48hr's)	15
leakage reporting system in place response times need to be improved	10
leakage reporting system in no response units in place	5
No leakage reporting system in place and no plans to create a leakage reporting system.	0

6. Planned Maintenance of all infrastructure - based on % of network value per annum (20 Points)

2% or more of the value of the water network is invested annually into the maintenance of the infrastructure	20
1.5% - 2% of the value of the water network is invested annually into the maintenance of the infrastructure	15
1.0% - 1.5% of the value of the water network is invested annually into the maintenance of the infrastructure	10
0.5% - 1.0% of the value of the water network is invested annually into the maintenance of the infrastructure	5
0% - 0.5% of the value of the water network is invested annually into the maintenance of the infrastructure	0

7. Effective WC/WDM Section in Place (20 Points)

Efficient WDM Section in place	20
WDM section requires some capacity building and training	15
Inefficient WDM section in place	10
No WDM section currently in place, intention to create WDM section	5
No WDM Section and no intention to create WDM section	0

8. Sectorisation of reticulation system in place (20 Points)

Reticulation is comprehensively sectorised into pressure zones which are all discrete. Flows and pressures in each are monitored monthly	20
Reticulation is comprehensively sectorised into pressure zones which are all discrete. Flows and pressures in each are not monitored	15
Reticulation is sectorised in theory, however, zone discreteness needs to be verified and confirmed	10
Plans exist indicating designed pressure zones, however these are no longer in place practically	5
No Discrete pressure zones or drawings indicating the proposed pressure zones exist	0

9. Control and Boundary Valve Maintenance Programme (10 Points)

All control valves and boundary valves are visited bi-annually to verify correct operation and serviced at least every five years.	10
All control valves and boundary valves are visited annually to verify correct operation and serviced when operation fails	7.5
Control valves and boundary valves are visited and serviced on and ad-hoc basis	5
Control valves and boundary valves are seldom visited	2.5
Control valves and boundary valves are never visited or serviced	0

10. Efficient bulk management metering system in place (10 Points)

All bulk inlets to the WSA are accurately metered by the WSA. (i.e. check meters are in place)	10
All bulk inlets to the WSA are metered by the Bulk water supplier or by the WSA	7.5
Few bulk meters are operational	5
No Bulk metering in place however a proposal to install bulk metering	2.5
No Bulk metering in place and no plans for any	0

11. Efficient Zone management metering system in place (10 Points)

All inlet points to discrete zones are metered and accurate	10
All inlet points to discrete zones are metered some meters are not functioning or are inaccurate	7.5
All inlet points to discrete zones are metered. Majority meters are not functioning or are inaccurate	5
Zone inputs are currently not metered. The WSA intends creating District Metered Areas (DMA's) / Zones and installing zone meters.	2.5
No accurate Zone metering in place and not intention of installing zone metering	0

12. As built drawings of all bulk and reticulation infrastructure (10 Points)

Accurate as-built drawings for all reticulation available digitally	10
As-build drawings available digitally for the majority of the network. as-built drawings available in hard copy for the remainder of the network	7.5
A mixture of digital and hard copy as-built drawings available for the majority of the network.	5
Hard copy as-built drawings available for portions of the network	2.5
No as-built drawings available	0

13. Pressure management (10 Points)

Comprehensive pressure management studies have been conducted, implemented and are being maintained within the municipality	10
Some pressure management studies have been conducted, implemented in certain areas within the municipality. Maintenance of these installations can be improved	7.5
Pressure management studies have been conducted but as yet have not been implemented or there is no scope for pressure management	5
No pressure management studies have been conducted however reservoir, tower and direct supply zones are kept discrete.	2.5
Pressure management has never been investigated or implemented within the municipality	0

14. Asset Register (10 Points)

WSA has a comprehensive and accurate asset register in place which is available digitally	10
WSA has a reasonably comprehensive and accurate asset register in place in hard copy	7.5
WSA has a poor asset register	5
WSA is in the process of developing an asset register	2.5
WSA has no asset register in place and no immediate intention of generating an asset register	0

15. Active Leakage Control (10 Points)

Active leakage detection undertaken continuously with efficient response to leaks detected	10
Active leakage detection undertaken continuously, response to leaks detected can be improved	7.5
Active leakage detection is done, usually by external consultants / contractors, Leaks reported are documented and repaired when staff are available	5
No active leakage detection is currently done however the WAS intends to conduct active leakage detection exercises	2.5
No active leakage detection is done and no intention to conduct active leakage detection	0

16. Community Awareness and Education Programmes related to Water Conservation (10 Points)

WSA is actively involved in conducting workshops on water conservation within the communities with a dedicated team	~~10~~
WSA is involved in conducting workshops on water conservation within the communities however no dedicated team exists	7.5
WSA has very little involvement with workshops on water conservation within the communities	5
WSA currently does not conduct workshops on water conservation within the communities, however these interventions are proposed	2.5
WSA currently does not conduct workshops on water conservation within the communities	0

17. School Awareness and Education Programmes related to Water Conservation (10 Points)

WSA is actively involved in conducting workshops on water conservation within the schools with a dedicated team	~~10~~
WSA is involved in conducting workshops on water conservation within the schools however no dedicated team exists	7.5
WSA has very little involvement with workshops on water conservation within the schools	5
WSA currently does not conduct workshops on water conservation within the schools, however these interventions are proposed	2.5
WSA currently does not conduct workshops on water conservation within the schools	0

18. Informative Billing / Itemised Billing (10 Points)

WSA produces informative, itemised billing. Indicating the water tariff structure and itemises the volumes of water consumed under each tariff	~~10~~
WSA itemises total consumption and free basic water only and indicate the water tariff structure on the bill	7.5
WSA itemises total consumption and free basic water only	5
WSA presently does not have itemised billing but intends developing an itemised billing	2.5
WSA has no informative or itemised billing	0

19. Newspaper / Radio WDM Education in Place (10 Points)

WSA regularly (at least once a month) runs programmes on the local Radio and has advertisements in the local press promoting Water Conservation	10
WSA runs programmes on the local Radio and has advertisements in the local press promoting Water Conservation every 1 - 6 months	~~7.5~~
WSA occasionally (at least once a year) makes use of local radio **or** has advertisements in the local press promoting water conservation	5
WSA seldom (less than once a year) makes use of local radio **or** has advertisements in the local press promoting water conservation	2.5
WSA does not make use of Radio or the local press to promote the importance of Water conservation at all	0

20. WDM Posters and leaflets for distribution in various languages (10 Points)

WSA has an extensive library of educational posters and leaflets dealing with water conservation issues in at least three languages	~~10~~
WSA has a library of educational posters and leaflets dealing with water conservation issues in at least two languages	7.5
WSA has a library of educational posters and leaflets dealing with water conservation issues in only one language	5
WSA has no educational posters or leaflets but intends producing these	2.5
WSA has no educational posters or leaflets and has no intention of producing these	0

Comments / Interventions proposed by the WSA / Municipality

uMgeni Local Municipality came second overall to Richards Bay in the KZN VUNA awards and came first for service delivery in KZN. All urban and peri urban residents that fall under town plans have access to metered water and full flush toilets.

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality			Unit	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**
Billed consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567
Unbilled potential paid consumption	% of system input volume	4.0%	m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Total potential revenue water		75%	**m3/annum**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**
Non-revenue water			**m3/annum**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**
Unbilled consumption	% of system input volume	1.0%	m3/annum	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600
Apparent losses		20.0%	m3/annum	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417
Unavoidable annual real losses		2.0	m3/annum	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Potential saving (Real losses)			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**
Target Sysem Input Volume			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**
% Reduction			**%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**
% return flow			m3/annum	59%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%
Return flow			m3/annum	180 910 000	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	Reduce 25% of MNF for _ % of area	20%	m3/annum	0	981 114	1 962 228	2 943 342	3 924 456	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570
Mains replacement	Replace _% per annum, Saving 200l/km/h	5%	m3/annum	448 249	896 498	1 344 748	1 792 997	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	550 180	1 100 360	1 650 540	2 200 719	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	15	m3/annum	0	1 454 479	2 908 957	4 363 436	5 817 914	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393
Water Wise Gardening	Reduce billed consumption by % for 1/3	7.5%	m3/annum	0	1 074 278	2 148 556	3 222 834	4 297 111	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389
Total direct interventions			**m3/annum**	**998 429**	**5 506 728**	**10 015 028**	**14 523 327**	**19 031 626**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**
Indirect measureable interventions																			
Sectorisation																			
Legislation																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	0.0%	0.3%	0.6%	0.9%	1.2%	1.4%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Other interventions			**m3/annum**	**0**	**941 970**	**1 883 940**	**2 825 910**	**3 767 880**	**4 238 865**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**
Total estimated savings			**m3/annum**	**998 429**	**6 448 698**	**11 898 968**	**17 349 237**	**22 799 506**	**26 780 362**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**
System Input Volume with WCWDM			**m3/annum**	**303 961 580**	**298 511 311**	**293 061 041**	**287 610 772**	**282 160 503**	**278 179 647**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**
% Reduction			**%**	**0%**	**2%**	**4%**	**6%**	**7%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
Improved metering & billing			**m3/annum**	**0**	**2 439 680**	**4 879 360**	**7 319 040**	**9 758 720**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**
Water use efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435
		OPEX	Rands	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044
Pressure management		CAPEX	Rands		4 000 000	4 000 000	4 000 000	4 000 000	4 000 000										
		OPEX	Rands	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044
Mains replacement	Replace _% / annum @ R 150 /m	CAPEX	Rands	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000
Retrofitting & removal of wasteful devices	20% of unmetered properties @ R 1000 / pr	CAPEX	Rands		8 080 436	8 080 436	8 080 436	8 080 436	8 080 436										
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0															
	R 5 / household / month	OPEX	Rands	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands		5 000 000	5 000 000	5 000 000	5 000 000	5 000 000										
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands		8 080 436	8 080 436	8 080 436	8 080 436	8 080 436										
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening	R 2000 per customer	CAPEX	Rands		91 578 280	91 578 280	91 578 280	91 578 280	91 578 280										
		OPEX	Rands	0															
TOTAL COSTS		**CAPEX**	Rands	**11 958 131**	**128 697 284**	**128 697 284**	**128 697 284**	**128 697 284**	**128 697 284**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**
		OPEX	Rands	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**
		TOTAL	Rands	**82 158 403**	**198 897 555**	**198 897 555**	**198 897 555**	**198 897 555**	**198 897 555**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**
		REDUCED PAYMENT	R 3.00	**2 995 287**	**19 346 095**	**35 696 903**	**52 047 711**	**68 398 519**	**80 341 085**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**
		ADDITIONAL INCOME	R 6.00	**0**	**14 638 080**	**29 276 161**	**43 914 241**	**58 552 322**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality			Unit	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**
Billed consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567
Unbilled potential paid consumption	% of system input volume	4.0%	m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Total potential revenue water		75%	**m3/annum**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**
Non-revenue water			**m3/annum**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**
Unbilled consumption	% of system input volume	1.0%	m3/annum	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600
Apparent losses		20.0%	m3/annum	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417
Unavoidable annual real losses		2.0	m3/annum	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Potential saving (Real losses)			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**
Target Sysem Input Volume			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**
% Reduction			**%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**
% return flow			m3/annum	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%
Return flow			m3/annum	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	Reduce 25% of MNF for _ % of area	20%	m3/annum	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570
Mains replacement	Replace _% per annum, Saving 200l/km/h	5%	m3/annum	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	15	m3/annum	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393
Water Wise Gardening	Reduce billed consumption by % for 1/3	7.5%	m3/annum	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389
Total direct interventions			**m3/annum**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**
Indirect measureable interventions																			
Sectorisation																			
Legislation																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Other interventions			**m3/annum**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**
Total estimated savings			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**
System Input Volume with WCWDM			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**
% Reduction			**%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
Improved metering & billing			**m3/annum**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**
Water use efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435
		OPEX	Rands	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044
Pressure management		CAPEX	Rands																
		OPEX	Rands	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044
Mains replacement	Replace _% / annum @ R 150 /m	CAPEX	Rands	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000
Retrofitting & removal of wasteful devices	20% of unmetered properties @ R 1000 / pr	CAPEX	Rands																
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands																
	R 5 / household / month	OPEX	Rands	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening	R 2000 per customer	CAPEX	Rands																
		OPEX	Rands																
TOTAL COSTS		**CAPEX**	Rands	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**
		OPEX	Rands	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**
		TOTAL	Rands	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**
	REDUCED PAYMENT		R 3.00	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**
	ADDITIONAL INCOME		R 6.00	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
System input volume without WCWDM			**m3/annum**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**14 028 160 414**	**304 960 009**
Billed consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	9 883 356 068	214 855 567
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	9 883 356 068	214 855 567
Unbilled potential paid consumption	% of system input volume	4.0%	m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	561 126 417	12 198 400
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	133 812 027	2 908 957
Total potential revenue water		75%	**m3/annum**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**10 578 294 512**	**229 962 924**
Non-revenue water			**m3/annum**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**3 449 865 902**	**74 997 085**
Unbilled consumption	% of system input volume	1.0%	m3/annum	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	140 281 604	3 049 600
Apparent losses		20.0%	m3/annum	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	689 973 180	14 999 417
Unavoidable annual real losses		2.0	m3/annum	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	1 366 049 175	29 696 721
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
Potential saving (Real losses)			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**1 253 561 942**	**27 251 347**
Target Sysem Input Volume			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**12 774 598 472**	**277 708 662**
% Reduction			**%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**	**8.9%**
% return flow			m3/annum	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	62%	57%	57%
Return flow			m3/annum	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	172 179 371	7 928 981 682	172 369 167
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	Reduce 25% of MNF for _ % of area	20%	m3/annum	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	210 939 492	4 585 641
Mains replacement	Replace _% per annum, Saving 200l/km/h	5%	m3/annum	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	98 614 824	2 143 801
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	121 039 565	2 631 295
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	15	m3/annum	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	7 272 393	312 712 890	6 798 106
Water Wise Gardening	Reduce billed consumption by % for 1/3	7.5%	m3/annum	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	230 969 734	5 021 081
Total direct interventions			**m3/annum**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**22 541 497**	**974 276 505**	**21 179 924**
Indirect measureable interventions																			
Sectorisation																			
Legislation																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.4%	1.4%
Other interventions			**m3/annum**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**4 709 850**	**202 052 558**	**4 392 447**
Total estimated savings			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**1 176 329 063**	**25 572 371**
System Input Volume with WCWDM			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**12 851 831 351**	**279 387 638**
% Reduction			**%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**8%**	**8%**
Improved metering & billing			**m3/annum**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**524 531 215**	**11 402 853**
Water use efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	**29 736 006**	**646 435**
		OPEX	Rands	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	**37 170 008**	**808 044**
Pressure management		CAPEX	Rands															**20 000 000**	**4 000 000**
		OPEX	Rands	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	**92 370 008**	**2 008 044**
Mains replacement	Replace _% / annum @ R 150 /m	CAPEX	Rands	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	**353 073 000**	**7 675 500**
		OPEX	Rands															**0**	**#DIV/0!**
Active and passive leakage control		CAPEX	Rands															**0**	**#DIV/0!**
	R 1500 / km	OPEX	Rands	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	**706 146 000**	**15 351 000**
Retrofitting & removal of wasteful devices	20% of unmetered properties @ R 1000 / pr	CAPEX	Rands															**40 402 182**	**8 080 436**
		OPEX	Rands															**0**	**#DIV/0!**
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	**167 265 034**	**3 636 196**
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Education and awareness campaigns		CAPEX	Rands															**0**	**0**
	R 5 / household / month	OPEX	Rands	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	**2 230 200 455**	**48 482 619**
Water audits / manage KPI's		CAPEX	Rands															**0**	**#DIV/0!**
	R 1500 / zone / month	OPEX	Rands	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	**133 812 027**	**2 908 957**
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands															**25 000 000**	**5 000 000**
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	**29 514 002**	**641 609**
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands															**40 402 182**	**8 080 436**
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Water Wise Gardening	R 2000 per customer	CAPEX	Rands																
		OPEX	Rands																
TOTAL COSTS		**CAPEX**	Rands	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**1 133 769 802**	**24 647 170**
		OPEX	Rands	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**3 229 212 499**	**70 200 272**
		TOTAL	Rands	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**82 158 403**	**4 362 982 301**	**94 847 441**
	REDUCED PAYMENT		R 3.00	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**3 528 987 188**	**76 717 113**
	ADDITIONAL INCOME		R 6.00	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**3 147 187 293**	**68 417 115**

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 6%

Net present cost			Unit	0 2006-07	1 2007-08	2 2008-09	3 2009-10	4 2010-11	5 2011-12	6 2012-13	7 2013-14	8 2014-15	9 2015-16	10 2016-17	11 2017-18	12 2018-19	13 2019-20	14 2020-21	15 2021-22
Sectorisation		CAPEX	Rands	646 435	609 844	575 325	542 759	512 037	483 054	455 711	429 916	405 581	382 624	360 966	340 534	321 258	303 074	285 919	269 735
		OPEX	Rands	808 044	762 305	719 156	678 449	640 046	603 817	569 639	537 395	506 977	478 280	451 207	425 667	401 573	378 842	357 398	337 168
Pressure management		CAPEX	Rands	0	3 773 585	3 559 986	3 358 477	3 168 375	2 989 033	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 008 044	1 894 381	1 787 152	1 685 992	1 590 559	1 500 527	1 415 592	1 335 464	1 259 871	1 188 558	1 121 281	1 057 812	997 936	941 449	888 160	837 886
Mains replacement		CAPEX	Rands	7 675 500	7 241 038	6 831 168	6 444 498	6 079 715	5 735 580	5 410 925	5 104 646	4 815 704	4 543 117	4 285 959	4 043 358	3 814 488	3 598 574	3 394 881	3 202 718
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	15 351 000	14 482 075	13 662 335	12 888 996	12 159 430	11 471 160	10 821 849	10 209 292	9 631 407	9 086 233	8 571 918	8 086 715	7 628 977	7 197 148	6 789 762	6 405 436
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	7 623 053	7 191 560	6 784 490	6 400 462	6 038 172	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	3 636 196	3 430 374	3 236 202	3 053 021	2 880 208	2 717 177	2 563 375	2 418 278	2 281 395	2 152 259	2 030 433	1 915 503	1 807 078	1 704 791	1 608 293	1 517 258
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	48 482 619	45 738 319	43 149 358	40 706 941	38 402 775	36 229 033	34 178 333	32 243 710	30 418 595	28 696 787	27 072 441	25 540 039	24 094 376	22 730 543	21 443 909	20 230 103
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 908 957	2 744 299	2 588 961	2 442 416	2 304 166	2 173 742	2 050 700	1 934 623	1 825 116	1 721 807	1 624 346	1 532 402	1 445 663	1 363 833	1 286 635	1 213 806
Management meters		CAPEX	Rands	0	4 716 981	4 449 982	4 198 096	3 960 468	3 736 291	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	641 609	605 291	571 029	538 707	508 214	479 447	452 309	426 706	402 553	379 767	358 271	337 991	318 860	300 811	283 784	267 721
Consumer meters		CAPEX	Rands	0	7 623 053	7 191 560	6 784 490	6 400 462	6 038 172	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	86 394 603	81 504 343	76 890 889	72 538 575	68 432 618	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**11 958 131**	**121 412 532**	**114 540 124**	**108 056 721**	**101 940 303**	**96 170 097**	**8 430 011**	**7 952 840**	**7 502 680**	**7 078 000**	**6 677 358**	**6 299 394**	**5 942 825**	**5 606 439**	**5 289 093**	**4 989 710**
		OPEX		**70 200 272**	**66 226 671**	**62 477 992**	**58 941 502**	**55 605 190**	**52 457 727**	**49 488 421**	**46 687 190**	**44 044 519**	**41 551 433**	**39 199 465**	**36 980 627**	**34 887 384**	**32 912 627**	**31 049 648**	**29 292 121**
		TOTAL		**82 158 403**	**187 639 203**	**177 018 116**	**166 998 223**	**157 545 493**	**148 627 824**	**57 918 432**	**54 640 030**	**51 547 198**	**48 629 433**	**45 876 823**	**43 280 022**	**40 830 209**	**38 519 065**	**36 338 741**	**34 281 831**
		REDUCED PAYMENT		**2 995 287**	**18 251 033**	**31 770 117**	**43 700 262**	**54 178 033**	**60 035 532**	**57 633 372**	**54 371 106**	**51 293 496**	**48 390 090**	**45 651 029**	**43 067 008**	**40 629 253**	**38 329 484**	**36 159 891**	**34 113 104**
		ADDITIONAL INCOME		**0**	**27 619 020**	**39 083 518**	**49 161 658**	**57 973 654**	**54 692 126**	**51 596 345**	**48 675 798**	**45 920 564**	**43 321 287**	**40 869 138**	**38 555 791**	**36 373 388**	**34 314 517**	**32 372 185**	**30 539 798**

Net present saving			6% Unit	0 2006-07	1 2007-08	2 2008-09	3 2009-10	4 2010-11	5 2011-12	6 2012-13	7 2013-14	8 2014-15	9 2015-16	10 2016-17	11 2017-18	12 2018-19	13 2019-20	14 2020-21	15 2021-22
Pressure management			m3/annum	0	925 579	1 746 376	2 471 286	3 108 536	3 665 727	3 458 233	3 262 484	3 077 815	2 903 599	2 739 244	2 584 193	2 437 918	2 299 922	2 169 738	2 046 923
Mains replacement			m3/annum	448 249	845 753	1 196 821	1 505 435	1 775 277	1 674 789	1 579 990	1 490 557	1 406 185	1 326 590	1 251 500	1 180 660	1 113 831	1 050 784	991 305	935 194
Active and passive leakage control			m3/annum	550 180	1 038 075	1 468 974	1 847 766	2 178 970	2 055 632	1 939 275	1 829 505	1 725 948	1 628 253	1 536 088	1 449 139	1 367 113	1 289 729	1 216 725	1 147 854
Retrofitting & removal of wasteful devices			m3/annum	0	1 372 150	2 588 961	3 663 625	4 608 333	5 434 355	5 126 750	4 836 557	4 562 789	4 304 518	4 060 866	3 831 006	3 614 156	3 409 582	3 216 586	3 034 515
Water Wise Gardening			m3/annum	0	1 013 470	1 912 207	2 705 953	3 403 715	4 013 814	3 786 617	3 572 281	3 370 076	3 179 317	2 999 356	2 829 581	2 669 416	2 518 317	2 375 771	2 241 293
Meter reading, billing & cost recovery			m3/annum	0	2 301 585	4 342 613	6 145 207	7 729 821	9 115 354	8 599 391	8 112 633	7 653 427	7 220 214	6 811 523	6 425 965	6 062 231	5 719 086	5 395 364	5 089 966
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	0	888 651	1 676 700	2 372 688	2 984 514	3 167 526	3 320 258	3 132 319	2 955 018	2 787 753	2 629 956	2 481 090	2 340 651	2 208 161	2 083 171	1 965 256
Total			**m3/annum**	**998 429**	**8 385 263**	**14 932 652**	**20 711 961**	**25 789 165**	**29 127 198**	**27 810 515**	**26 236 335**	**24 751 259**	**23 350 245**	**22 028 533**	**20 781 635**	**19 605 316**	**18 495 581**	**17 448 661**	**16 461 001**

Unit reference values

All interventions				**82.3**	**22.4**	**11.9**	**8.1**	**6.1**	**5.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management					6.1	3.1	2.0	1.5	1.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement				17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				27.9	14.0	9.3	7.0	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices					5.6	2.8	1.9	1.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					85.2	42.6	28.4	21.3	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					4.8	2.4	1.6	1.2	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management					21.2	10.6	7.1	5.3	4.7	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Awareness campaigns & Efficiency					102.9	51.5	34.3	25.7	22.9	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 6%

Net present cost			Unit	16 2022-23	17 2023-24	18 2024-25	19 2025-26	20 2026-27	21 2027-28	22 2028-29	23 2029-30	24 2030-31	25 2031-32	26 2032-33	27 2033-34	28 2034-35	29 2035-36	30 2036-37	31 2037-38
Sectorisation		CAPEX	Rands	254 467	240 063	226 474	213 655	201 561	190 152	179 389	169 235	159 656	150 618	142 093	134 050	126 462	119 304	112 551	106 180
		OPEX	Rands	318 083	300 079	283 093	267 069	251 952	237 690	224 236	211 544	199 569	188 273	177 616	167 562	158 078	149 130	140 689	132 725
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	790 459	745 716	703 506	663 685	626 117	590 677	557 242	525 700	495 944	467 871	441 388	416 404	392 834	370 598	349 621	329 831
Mains replacement		CAPEX	Rands	3 021 432	2 850 408	2 689 064	2 536 853	2 393 257	2 257 790	2 129 990	2 009 425	1 895 684	1 788 381	1 687 152	1 591 653	1 501 559	1 416 565	1 336 382	1 260 738
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	6 042 864	5 700 815	5 378 128	5 073 705	4 786 514	4 515 580	4 259 981	4 018 850	3 791 368	3 576 762	3 374 304	3 183 305	3 003 118	2 833 130	2 672 765	2 521 476
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	1 431 375	1 350 354	1 273 919	1 201 810	1 133 783	1 069 607	1 009 063	951 946	898 063	847 229	799 272	754 031	711 350	671 085	633 099	597 263
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	19 085 003	18 004 719	16 985 584	16 024 136	15 117 110	14 261 424	13 454 174	12 692 617	11 974 167	11 296 384	10 656 966	10 053 741	9 484 662	8 947 794	8 441 315	7 963 505
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 145 100	1 080 283	1 019 135	961 448	907 027	855 685	807 250	761 557	718 450	677 783	639 418	603 224	569 080	536 868	506 479	477 810
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	252 567	238 271	224 784	212 060	200 057	188 733	178 050	167 971	158 464	149 494	141 032	133 049	125 518	118 413	111 711	105 387
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**4 707 274**	**4 440 824**	**4 189 457**	**3 952 318**	**3 728 602**	**3 517 549**	**3 318 442**	**3 130 606**	**2 953 402**	**2 786 228**	**2 628 517**	**2 479 733**	**2 339 371**	**2 206 954**	**2 082 032**	**1 964 181**
		OPEX		**27 634 076**	**26 069 883**	**24 594 229**	**23 202 103**	**21 888 777**	**20 649 789**	**19 480 933**	**18 378 239**	**17 337 961**	**16 356 567**	**15 430 724**	**14 557 287**	**13 733 289**	**12 955 933**	**12 222 578**	**11 530 734**
		REDUCED PAYMENT		**32 341 350**	**30 510 708**	**28 783 686**	**27 154 421**	**25 617 378**	**24 167 338**	**22 799 376**	**21 508 845**	**20 291 363**	**19 142 795**	**18 059 241**	**17 037 020**	**16 072 660**	**15 162 887**	**14 304 610**	**13 494 915**
		ADDITIONAL INCOME		**32 182 174**	**30 360 541**	**28 642 020**	**27 020 774**	**25 491 296**	**24 048 392**	**22 687 163**	**21 402 984**	**20 191 494**	**19 048 579**	**17 970 358**	**16 953 168**	**15 993 554**	**15 088 259**	**14 234 207**	**13 428 497**
				28 811 130	**27 180 311**	**25 641 803**	**24 190 380**	**22 821 113**	**21 529 352**	**20 310 710**	**19 161 047**	**18 076 459**	**17 053 263**	**16 087 984**	**15 177 344**	**14 318 249**	**13 507 782**	**12 743 191**	**12 021 878**

Net present saving			Unit	6% 16 2022-23	17 2023-24	18 2024-25	19 2025-26	20 2026-27	21 2027-28	22 2028-29	23 2029-30	24 2030-31	25 2031-32	26 2032-33	27 2033-34	28 2034-35	29 2035-36	30 2036-37	31 2037-38
Pressure management			m3/annum	1 931 059	1 821 754	1 718 636	1 621 355	1 529 580	1 443 000	1 361 321	1 284 265	1 211 570	1 142 991	1 078 293	1 017 258	959 677	905 356	854 109	805 764
Mains replacement			m3/annum	882 258	832 319	785 207	740 761	698 831	659 275	621 957	586 752	553 540	522 207	492 648	464 763	438 455	413 637	390 224	368 136
Active and passive leakage control			m3/annum	1 082 881	1 021 586	963 760	909 208	857 743	809 192	763 389	720 178	679 413	640 956	604 675	570 448	538 159	507 697	478 959	451 849
Retrofitting & removal of wasteful devices			m3/annum	2 862 750	2 700 708	2 547 838	2 403 620	2 267 566	2 139 214	2 018 126	1 903 893	1 796 125	1 694 458	1 598 545	1 508 061	1 422 699	1 342 169	1 266 197	1 194 526
Water Wise Gardening			m3/annum	2 114 427	1 994 743	1 881 833	1 775 314	1 674 825	1 580 023	1 490 588	1 406 215	1 326 618	1 251 526	1 180 685	1 113 854	1 050 806	991 326	935 213	882 277
Meter reading, billing & cost recovery			m3/annum	4 801 855	4 530 052	4 273 634	4 031 730	3 803 519	3 588 225	3 385 118	3 193 508	3 012 743	2 842 211	2 681 331	2 529 557	2 386 375	2 251 297	2 123 865	2 003 646
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	1 854 015	1 749 071	1 650 067	1 556 667	1 468 553	1 385 428	1 307 007	1 233 026	1 163 232	1 097 389	1 035 272	976 672	921 389	869 235	820 033	773 616
Total			**m3/annum**	**15 529 246**	**14 650 232**	**13 820 974**	**13 038 655**	**12 300 618**	**11 604 356**	**10 947 506**	**10 327 836**	**9 743 241**	**9 191 737**	**8 671 450**	**8 180 613**	**7 717 560**	**7 280 717**	**6 868 601**	**6 479 812**

Unit reference values

All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management				2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Awareness campaigns & Efficiency				20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 6%

Net present cost			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Sectorisation		CAPEX	Rands	100 170	94 500	89 151	84 105	79 344	74 853	70 616	66 619	62 848	59 290	55 934	52 768	49 781	46 964	10 637 624	231 253
		OPEX	Rands	125 212	118 125	111 439	105 131	99 180	93 566	88 270	83 273	78 560	74 113	69 918	65 960	62 227	58 704	13 297 031	289 066
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16 849 455	366 293
		OPEX	Rands	311 161	293 548	276 932	261 257	246 469	232 518	219 356	206 940	195 226	184 176	173 751	163 916	154 638	145 885	33 044 029	718 348
Mains replacement		CAPEX	Rands	1 189 375	1 122 052	1 058 540	998 623	942 097	888 771	838 463	791 003	746 229	703 990	664 141	626 548	591 083	557 626	126 306 739	2 745 799
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 378 751	2 244 105	2 117 080	1 997 245	1 884 194	1 777 541	1 676 926	1 582 005	1 492 458	1 407 979	1 328 282	1 253 096	1 182 166	1 115 251	252 613 478	5 491 597
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34 037 738	739 951
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	563 456	531 562	501 473	473 088	446 310	421 047	397 214	374 730	353 519	333 508	314 631	296 821	280 020	264 170	59 836 637	1 300 796
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	7 512 740	7 087 491	6 686 312	6 307 842	5 950 794	5 613 957	5 296 186	4 996 401	4 713 586	4 446 779	4 195 075	3 957 618	3 733 602	3 522 266	797 821 831	17 343 953
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	450 764	425 249	401 179	378 471	357 048	336 837	317 771	299 784	282 815	266 807	251 704	237 457	224 016	211 336	47 869 310	1 040 637
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21 061 819	457 866
		OPEX	Rands	99 422	93 794	88 485	83 477	78 752	74 294	70 089	66 121	62 379	58 848	55 517	52 374	49 410	46 613	10 558 206	229 526
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34 037 738	739 951
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	385 761 028	8 386 109
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**1 853 001**	**1 748 114**	**1 649 164**	**1 555 815**	**1 467 750**	**1 384 670**	**1 306 293**	**1 232 351**	**1 162 596**	**1 096 788**	**1 034 706**	**976 138**	**920 885**	**868 759**	**688 528 779**	**14 968 017**
		OPEX		**10 878 051**	**10 262 313**	**9 681 427**	**9 133 422**	**8 616 436**	**8 128 713**	**7 668 597**	**7 234 525**	**6 825 024**	**6 438 702**	**6 074 247**	**5 730 422**	**5 406 058**	**5 100 055**	**1 155 203 884**	**25 113 128**
		TOTAL		**12 731 052**	**12 010 427**	**11 330 591**	**10 689 237**	**10 084 186**	**9 513 383**	**8 974 889**	**8 466 877**	**7 987 620**	**7 535 490**	**7 108 953**	**6 706 560**	**6 326 943**	**5 968 814**	**1 843 732 663**	**40 081 145**
		REDUCED PAYMENT		**12 668 393**	**11 951 314**	**11 274 825**	**10 636 627**	**10 034 554**	**9 466 560**	**8 930 717**	**8 425 205**	**7 948 307**	**7 498 402**	**7 073 965**	**6 673 551**	**6 295 803**	**5 939 437**	**1 130 129 219**	**24 568 026**
		ADDITIONAL INCOME		**11 341 394**	**10 699 428**	**10 093 800**	**9 522 453**	**8 983 446**	**8 474 949**	**7 995 235**	**7 542 675**	**7 115 731**	**6 712 954**	**6 332 975**	**5 974 505**	**5 636 325**	**5 317 288**	**1 051 443 944**	**22 857 477**

6%

Net present saving			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Pressure management			m3/annum	760 154	717 127	676 535	638 240	602 113	568 032	535 879	505 546	476 930	449 934	424 466	400 440	377 773	356 390	**67 073 121**	**1 458 111**
Mains replacement			m3/annum	347 298	327 639	309 094	291 598	275 092	259 521	244 831	230 973	217 899	205 565	193 929	182 952	172 596	162 827	**32 645 702**	**709 689**
Active and passive leakage control			m3/annum	426 272	402 144	379 381	357 906	337 647	318 535	300 505	283 495	267 448	252 310	238 028	224 555	211 844	199 853	**40 069 245**	**871 071**
Retrofitting & removal of wasteful devices			m3/annum	1 126 911	1 063 124	1 002 947	946 176	892 619	842 093	794 428	749 460	707 038	667 017	629 261	593 643	560 040	528 340	**99 434 342**	**2 161 616**
Water Wise Gardening			m3/annum	832 336	785 223	740 777	698 846	659 288	621 970	586 764	553 551	522 218	492 659	464 772	438 464	413 646	390 232	**73 442 203**	**1 596 570**
Meter reading, billing & cost recovery			m3/annum	1 890 232	1 783 238	1 682 300	1 587 076	1 497 241	1 412 492	1 332 539	1 257 112	1 185 955	1 118 826	1 055 496	995 751	939 388	886 215	**166 786 908**	**3 625 802**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	729 826	688 515	649 543	612 776	578 091	545 368	514 499	485 376	457 902	431 983	407 531	384 463	362 701	342 171	**64 045 127**	**1 392 285**
Total			**m3/annum**	**6 113 030**	**5 767 010**	**5 440 575**	**5 132 618**	**4 842 092**	**4 568 012**	**4 309 445**	**4 065 514**	**3 835 391**	**3 618 293**	**3 413 484**	**3 220 268**	**3 037 989**	**2 866 027**	**543 496 648**	**11 815 145**

Unit reference values

All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**3.4**	**3.4**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.7
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.9	3.9
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	6.3	6.3
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	5.3
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6
Management				2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.2	3.2
Awareness campaigns & Efficiency				20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	24.9	24.9

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

			Discount rate :	8%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Sectorisation		CAPEX	Rands		646 435	598 551	554 214	513 161	475 149	439 953	407 364	377 189	349 249	323 378	299 424	277 245	256 708	237 693	220 086	203 783
		OPEX	Rands		808 044	748 189	692 767	641 451	593 936	549 941	509 205	471 486	436 561	404 223	374 281	346 556	320 885	297 116	275 107	254 729
Pressure management		CAPEX	Rands		0	3 703 704	3 429 355	3 175 329	2 940 119	2 722 333	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		2 008 044	1 859 300	1 721 574	1 594 050	1 475 972	1 366 641	1 265 408	1 171 674	1 084 883	1 004 522	930 113	861 215	797 422	738 353	683 661	633 019
Mains replacement		CAPEX	Rands		7 675 500	7 106 944	6 580 504	6 093 059	5 641 722	5 223 816	4 836 867	4 478 581	4 146 834	3 839 661	3 555 242	3 291 890	3 048 047	2 822 265	2 613 209	2 419 638
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		15 351 000	14 213 889	13 161 008	12 186 119	11 283 443	10 447 633	9 673 734	8 957 161	8 293 668	7 679 322	7 110 483	6 583 781	6 096 093	5 644 531	5 226 417	4 839 275
Retrofitting & removal of wasteful devices		CAPEX	Rands		0	7 481 886	6 927 672	6 414 511	5 939 362	5 499 409	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands		3 636 196	3 366 849	3 117 452	2 886 530	2 672 713	2 474 734	2 291 421	2 121 686	1 964 524	1 819 003	1 684 262	1 559 502	1 443 984	1 337 022	1 237 983	1 146 281
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		48 482 619	44 891 314	41 566 031	38 487 066	35 636 172	32 996 456	30 552 274	28 289 142	26 193 650	24 253 380	22 456 833	20 793 364	19 253 115	17 826 958	16 506 443	15 283 743
Water audits / manage KPI's		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		2 908 957	2 693 479	2 493 962	2 309 224	2 138 170	1 979 787	1 833 136	1 697 349	1 571 619	1 455 203	1 347 410	1 247 602	1 155 187	1 069 617	990 387	917 025
Management meters		CAPEX	Rands		0	4 629 630	4 286 694	3 969 161	3 675 149	3 402 916	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		641 609	594 082	550 076	509 330	471 602	436 668	404 322	374 373	346 641	320 964	297 189	275 175	254 792	235 918	218 443	202 262
Consumer meters		CAPEX	Rands		0	7 481 886	6 927 672	6 414 511	5 939 362	5 499 409	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands		0	84 794 703	78 513 614	72 697 791	67 312 769	62 326 638	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**			**11 958 131**	**119 164 152**	**110 337 177**	**102 164 053**	**94 596 346**	**87 589 209**	**7 535 651**	**6 977 455**	**6 460 606**	**5 982 043**	**5 538 929**	**5 128 638**	**4 748 738**	**4 396 980**	**4 071 278**	**3 769 702**
		OPEX			**70 200 272**	**65 000 252**	**60 185 418**	**55 727 239**	**51 599 295**	**47 777 125**	**44 238 079**	**40 961 184**	**37 927 022**	**35 117 613**	**32 516 309**	**30 107 693**	**27 877 494**	**25 812 494**	**23 900 458**	**22 130 053**
		TOTAL			**82 158 403**	**184 164 403**	**170 522 596**	**157 891 292**	**146 195 641**	**135 366 334**	**51 773 730**	**47 938 639**	**44 387 629**	**41 099 656**	**38 055 237**	**35 236 331**	**32 626 232**	**30 209 474**	**27 971 735**	**25 899 755**
		REDUCED PAYMENT			**2 995 287**	**17 913 051**	**30 604 341**	**41 317 151**	**50 274 953**	**54 678 792**	**51 518 913**	**47 702 697**	**44 169 164**	**40 897 374**	**37 867 939**	**35 062 906**	**32 465 654**	**30 060 791**	**27 834 065**	**25 772 283**
		ADDITIONAL INCOME			**0**	**27 107 556**	**37 649 384**	**46 480 721**	**53 797 131**	**49 812 158**	**46 122 368**	**42 705 897**	**39 542 497**	**36 613 423**	**33 901 318**	**31 390 109**	**29 064 916**	**26 911 959**	**24 918 481**	**23 072 667**

				8%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Pressure management			m3/annum		0	908 439	1 682 294	2 336 520	2 884 592	3 338 648	3 091 341	2 862 353	2 650 327	2 454 006	2 272 228	2 103 915	1 948 069	1 803 768	1 670 155	1 546 440
Mains replacement			m3/annum		448 249	830 091	1 152 904	1 423 339	1 647 383	1 525 354	1 412 365	1 307 746	1 210 875	1 121 181	1 038 131	961 232	890 030	824 102	763 057	706 534
Active and passive leakage control			m3/annum		550 180	1 018 852	1 415 072	1 747 002	2 021 993	1 872 216	1 733 533	1 605 123	1 486 225	1 376 134	1 274 199	1 179 814	1 092 420	1 011 500	936 574	867 198
Retrofitting & removal of wasteful devices			m3/annum		0	1 346 739	2 493 962	3 463 836	4 276 341	4 949 468	4 582 841	4 243 371	3 929 048	3 638 007	3 368 525	3 119 005	2 887 967	2 674 044	2 475 966	2 292 562
Water Wise Gardening			m3/annum		0	994 702	1 842 040	2 558 389	3 158 505	3 655 677	3 384 886	3 134 154	2 901 994	2 687 032	2 487 992	2 303 697	2 133 053	1 975 049	1 828 749	1 693 286
Meter reading, billing & cost recovery			m3/annum		0	2 258 963	4 183 265	5 810 090	7 172 951	8 302 026	7 687 061	7 117 649	6 590 416	6 102 237	5 650 220	5 231 685	4 844 153	4 485 326	4 153 080	3 845 445
Water Use Efficiency			m3/annum		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum		0	872 194	1 615 175	2 243 298	2 769 504	2 884 900	2 968 004	2 748 152	2 544 585	2 356 098	2 181 572	2 019 974	1 870 346	1 731 802	1 603 520	1 484 741
Total			**m3/annum**		**998 429**	**8 229 980**	**14 384 712**	**19 582 474**	**23 931 268**	**26 528 290**	**24 860 032**	**23 018 548**	**21 313 471**	**19 734 695**	**18 272 866**	**16 919 320**	**15 666 037**	**14 505 590**	**13 431 102**	**12 436 205**
Unit reference values																				
All interventions					**82.3**	**22.4**	**11.9**	**8.1**	**6.1**	**5.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management						6.1	3.1	2.0	1.5	1.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement					17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC					27.9	14.0	9.3	7.0	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices						5.6	2.8	1.9	1.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening						85.2	42.6	28.4	21.3	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery						4.8	2.4	1.6	1.2	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management						21.2	10.6	7.1	5.3	4.7	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Awareness campaigns & Efficiency						102.9	51.5	34.3	25.7	22.9	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 8%

Net present cost			Unit	16 2022-23	17 2023-24	18 2024-25	19 2025-26	20 2026-27	21 2027-28	22 2028-29	23 2029-30	24 2030-31	25 2031-32	26 2032-33	27 2033-34	28 2034-35	29 2035-36	30 2036-37	31 2037-38
Sectorisation		CAPEX	Rands	188 688	174 711	161 770	149 787	138 691	128 418	118 906	110 098	101 942	94 391	87 399	80 925	74 931	69 380	64 241	59 482
		OPEX	Rands	235 860	218 389	202 212	187 233	173 364	160 523	148 632	137 622	127 428	117 989	109 249	101 156	93 663	86 725	80 301	74 353
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	586 129	542 712	502 511	465 288	430 822	398 909	369 361	342 001	316 667	293 210	271 491	251 381	232 760	215 518	199 554	184 772
Mains replacement		CAPEX	Rands	2 240 405	2 074 449	1 920 786	1 778 506	1 646 765	1 524 782	1 411 835	1 307 255	1 210 421	1 120 760	1 037 741	960 871	889 696	823 792	762 771	706 269
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	4 480 811	4 148 899	3 841 573	3 557 012	3 293 530	3 049 564	2 823 671	2 614 510	2 420 843	2 241 521	2 075 482	1 921 743	1 779 392	1 647 585	1 525 541	1 412 538
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	1 061 371	982 751	909 955	842 551	780 139	722 351	668 844	619 300	573 426	530 950	491 620	455 204	421 485	390 264	361 355	334 588
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	14 151 614	13 103 346	12 132 728	11 234 008	10 401 859	9 631 351	8 917 917	8 257 331	7 645 677	7 079 330	6 554 936	6 069 385	5 619 801	5 203 519	4 818 073	4 461 179
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	849 097	786 201	727 964	674 040	624 112	577 881	535 075	495 440	458 741	424 760	393 296	364 163	337 188	312 211	289 084	267 671
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	187 279	173 407	160 562	148 668	137 656	127 459	118 018	109 276	101 181	93 686	86 747	80 321	74 371	68 862	63 761	59 038
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**3 490 465**	**3 231 912**	**2 992 511**	**2 770 843**	**2 565 596**	**2 375 552**	**2 199 585**	**2 036 653**	**1 885 789**	**1 746 101**	**1 616 760**	**1 497 000**	**1 386 111**	**1 283 437**	**1 188 367**	**1 100 340**
		OPEX		**20 490 790**	**18 972 954**	**17 567 550**	**16 266 250**	**15 061 342**	**13 945 687**	**12 912 674**	**11 956 179**	**11 070 536**	**10 250 497**	**9 491 201**	**8 788 149**	**8 137 175**	**7 534 421**	**6 976 316**	**6 459 552**
		TOTAL		**23 981 255**	**22 204 865**	**20 560 061**	**19 037 093**	**17 626 938**	**16 321 239**	**15 112 258**	**13 992 832**	**12 956 326**	**11 996 598**	**11 107 961**	**10 285 149**	**9 523 286**	**8 817 858**	**8 164 683**	**7 559 892**
		REDUCED PAYMENT		**23 863 225**	**22 095 579**	**20 458 869**	**18 943 397**	**17 540 183**	**16 240 910**	**15 037 880**	**13 923 963**	**12 892 558**	**11 937 554**	**11 053 290**	**10 234 528**	**9 476 415**	**8 774 458**	**8 124 498**	**7 522 684**
		ADDITIONAL INCOME		**21 363 581**	**19 781 093**	**18 315 827**	**16 959 099**	**15 702 870**	**14 539 694**	**13 462 680**	**12 465 444**	**11 542 078**	**10 687 109**	**9 895 471**	**9 162 474**	**8 483 772**	**7 855 344**	**7 273 467**	**6 734 692**

Net present saving			**8%** Unit	16 2022-23	17 2023-24	18 2024-25	19 2025-26	20 2026-27	21 2027-28	22 2028-29	23 2029-30	24 2030-31	25 2031-32	26 2032-33	27 2033-34	28 2034-35	29 2035-36	30 2036-37	31 2037-38
Pressure management			m3/annum	1 431 889	1 325 823	1 227 614	1 136 680	1 052 481	974 520	902 333	835 493	773 605	716 301	663 242	614 113	568 623	526 503	487 502	451 391
Mains replacement			m3/annum	654 198	605 739	560 870	519 324	480 855	445 236	412 256	381 718	353 443	327 262	303 020	280 574	259 791	240 547	222 729	206 231
Active and passive leakage control			m3/annum	802 961	743 483	688 410	637 417	590 200	546 482	506 002	468 520	433 815	401 681	371 926	344 376	318 867	295 247	273 377	253 127
Retrofitting & removal of wasteful devices			m3/annum	2 122 742	1 965 502	1 819 909	1 685 101	1 560 279	1 444 703	1 337 688	1 238 600	1 146 852	1 061 900	983 240	910 408	842 970	780 528	722 711	669 177
Water Wise Gardening			m3/annum	1 567 857	1 451 720	1 344 185	1 244 616	1 152 422	1 067 057	988 016	914 830	847 065	784 319	726 221	672 427	622 618	576 498	533 794	494 254
Meter reading, billing & cost recovery			m3/annum	3 560 597	3 296 849	3 052 638	2 826 517	2 617 145	2 423 282	2 243 780	2 077 574	1 923 680	1 781 185	1 649 245	1 527 079	1 413 962	1 309 224	1 212 244	1 122 449
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	1 374 760	1 272 926	1 178 635	1 091 329	1 010 490	935 639	866 332	802 159	742 740	687 722	636 780	589 611	545 936	505 496	468 052	433 382
Total			**m3/annum**	**11 515 005**	**10 662 042**	**9 872 261**	**9 140 982**	**8 463 872**	**7 836 919**	**7 256 406**	**6 718 895**	**6 221 199**	**5 760 369**	**5 333 675**	**4 938 588**	**4 572 767**	**4 234 043**	**3 920 411**	**3 630 010**

Unit reference values

All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management				2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Awareness campaigns & Efficiency				20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 8%

Net present cost			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Sectorisation		CAPEX	Rands	55 076	50 997	47 219	43 721	40 483	37 484	34 707	32 136	29 756	27 552	25 511	23 621	21 872	20 251	8 473 728	184 211
		OPEX	Rands	68 845	63 746	59 024	54 652	50 603	46 855	43 384	40 171	37 195	34 440	31 889	29 527	27 339	25 314	10 592 161	230 264
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15 970 840	347 192
		OPEX	Rands	171 085	158 412	146 678	135 813	125 753	116 438	107 813	99 827	92 432	85 585	79 246	73 376	67 940	62 908	26 322 242	572 223
Mains replacement		CAPEX	Rands	653 953	605 512	560 659	519 129	480 675	445 069	412 101	381 575	353 310	327 139	302 907	280 469	259 694	240 457	100 613 536	2 187 251
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 307 906	1 211 024	1 121 318	1 038 258	961 350	890 139	824 203	763 151	706 621	654 279	605 813	560 938	519 387	480 914	201 227 071	4 374 502
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32 262 840	701 366
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	309 804	286 856	265 607	245 932	227 715	210 847	195 229	180 768	167 378	154 979	143 499	132 870	123 027	113 914	47 664 722	1 036 190
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	4 130 721	3 824 742	3 541 428	3 279 100	3 036 203	2 811 299	2 603 055	2 410 236	2 231 700	2 066 389	1 913 323	1 771 596	1 640 366	1 518 858	635 529 630	13 815 862
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	247 843	229 485	212 486	196 746	182 172	168 678	156 183	144 614	133 902	123 983	114 799	106 296	98 422	91 131	38 131 778	828 952
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19 963 550	433 990
		OPEX	Rands	54 665	50 616	46 867	43 395	40 180	37 204	34 448	31 897	29 534	27 346	25 321	23 445	21 708	20 100	8 410 465	182 836
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32 262 840	701 366
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	365 645 516	7 948 816
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**1 018 833**	**943 364**	**873 485**	**808 783**	**748 873**	**693 401**	**642 038**	**594 479**	**550 444**	**509 670**	**471 917**	**436 960**	**404 593**	**374 623**	**622 857 572**	**13 540 382**
		OPEX		**5 981 066**	**5 538 024**	**5 127 800**	**4 747 963**	**4 396 262**	**4 070 613**	**3 769 086**	**3 489 895**	**3 231 384**	**2 992 022**	**2 770 391**	**2 565 177**	**2 375 164**	**2 199 226**	**920 213 347**	**20 004 638**
		TOTAL		**6 999 900**	**6 481 389**	**6 001 286**	**5 556 746**	**5 145 135**	**4 764 014**	**4 411 124**	**4 084 374**	**3 781 828**	**3 501 693**	**3 242 308**	**3 002 137**	**2 779 756**	**2 573 849**	**1 543 070 919**	**33 545 020**
		REDUCED PAYMENT		**6 965 448**	**6 449 489**	**5 971 749**	**5 529 397**	**5 119 812**	**4 740 567**	**4 389 414**	**4 064 272**	**3 763 215**	**3 484 458**	**3 226 350**	**2 987 361**	**2 766 075**	**2 561 181**	**861 274 138**	**18 723 351**
		ADDITIONAL INCOME		**6 235 826**	**5 773 913**	**5 346 215**	**4 950 199**	**4 583 518**	**4 243 998**	**3 929 628**	**3 638 544**	**3 369 023**	**3 119 465**	**2 888 394**	**2 674 439**	**2 476 332**	**2 292 900**	**808 837 672**	**17 583 428**

8%

Net present saving			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Pressure management			m3/annum	417 955	386 995	358 329	331 786	307 209	284 453	263 382	243 873	225 808	209 081	193 594	179 254	165 976	153 681	**50 962 582**	**1 107 882**
Mains replacement			m3/annum	190 954	176 810	163 713	151 586	140 357	129 960	120 334	111 420	103 167	95 525	88 449	81 897	75 831	70 213	**25 216 581**	**548 187**
Active and passive leakage control			m3/annum	234 377	217 015	200 940	186 056	172 274	159 513	147 697	136 757	126 626	117 247	108 562	100 520	93 074	86 180	**30 950 763**	**672 843**
Retrofitting & removal of wasteful devices			m3/annum	619 608	573 711	531 214	491 865	455 431	421 695	390 458	361 535	334 755	309 958	286 998	265 739	246 055	227 829	**75 550 842**	**1 642 410**
Water Wise Gardening			m3/annum	457 643	423 743	392 355	363 291	336 381	311 464	288 392	267 030	247 250	228 935	211 977	196 275	181 736	168 274	**55 801 851**	**1 213 084**
Meter reading, billing & cost recovery			m3/annum	1 039 304	962 319	891 036	825 033	763 920	707 333	654 938	606 424	561 504	519 911	481 399	445 740	412 722	382 150	**126 725 749**	**2 754 908**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	401 279	371 555	344 032	318 549	294 952	273 104	252 874	234 143	216 799	200 740	185 870	172 102	159 354	147 550	**48 608 760**	**1 056 712**
Total			**m3/annum**	**3 361 120**	**3 112 148**	**2 881 619**	**2 668 166**	**2 470 524**	**2 287 522**	**2 118 076**	**1 961 181**	**1 815 909**	**1 681 397**	**1 556 849**	**1 441 527**	**1 334 747**	**1 235 877**	**413 817 128**	**8 996 025**

Unit reference values

All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**3.7**	**3.7**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.8	0.8
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.0	4.0
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	6.5	6.5
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	6.6
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6
Management				2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.5	3.5
Awareness campaigns & Efficiency				20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	26.1	26.1

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

			Discount rate :	10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Sectorisation		CAPEX	Rands		646 435	587 668	534 244	485 676	441 524	401 385	364 896	331 723	301 567	274 152	249 229	226 571	205 974	187 249	170 227	154 751
		OPEX	Rands		808 044	734 585	667 805	607 095	551 905	501 732	456 120	414 654	376 958	342 689	311 536	283 214	257 468	234 061	212 783	193 439
Pressure management		CAPEX	Rands		0	3 636 364	3 305 785	3 005 259	2 732 054	2 483 685	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		2 008 044	1 825 494	1 659 540	1 508 673	1 371 521	1 246 837	1 133 488	1 030 444	936 767	851 607	774 188	703 807	639 825	581 659	528 781	480 710
Mains replacement		CAPEX	Rands		7 675 500	6 977 727	6 343 388	5 766 717	5 242 470	4 765 882	4 332 620	3 938 745	3 580 677	3 255 161	2 959 238	2 690 216	2 445 651	2 223 319	2 021 199	1 837 454
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		15 351 000	13 955 455	12 686 777	11 533 434	10 484 940	9 531 763	8 665 239	7 877 490	7 161 355	6 510 323	5 918 475	5 380 432	4 891 302	4 446 638	4 042 398	3 674 907
Retrofitting & removal of wasteful devices		CAPEX	Rands		0	7 345 851	6 678 047	6 070 951	5 519 047	5 017 315	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands		3 636 196	3 305 633	3 005 121	2 731 928	2 483 571	2 257 792	2 052 538	1 865 944	1 696 312	1 542 102	1 401 911	1 274 465	1 158 604	1 053 277	957 524	870 477
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		48 482 619	44 075 108	40 068 280	36 425 709	33 114 281	30 103 892	27 367 174	24 879 249	22 617 499	20 561 363	18 692 148	16 992 862	15 448 056	14 043 688	12 766 989	11 606 353
Water audits / manage KPI's		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		2 908 957	2 644 506	2 404 097	2 185 543	1 986 857	1 806 234	1 642 030	1 492 755	1 357 050	1 233 682	1 121 529	1 019 572	926 883	842 621	766 019	696 381
Management meters		CAPEX	Rands		0	4 545 455	4 132 231	3 756 574	3 415 067	3 104 607	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		641 609	583 281	530 255	482 050	438 227	398 389	362 171	329 247	299 315	272 105	247 368	224 880	204 436	185 851	168 956	153 596
Consumer meters		CAPEX	Rands		0	7 345 851	6 678 047	6 070 951	5 519 047	5 017 315	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands		0	83 252 981	75 684 529	68 804 117	62 549 197	56 862 906	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**			**11 958 131**	**116 997 531**	**106 361 391**	**96 692 174**	**87 901 976**	**79 910 888**	**6 750 053**	**6 136 412**	**5 578 557**	**5 071 415**	**4 610 377**	**4 191 252**	**3 810 229**	**3 463 845**	**3 148 950**	**2 862 682**
		OPEX			**70 200 272**	**63 818 429**	**58 016 753**	**52 742 503**	**47 947 730**	**43 588 846**	**39 626 223**	**36 023 839**	**32 748 945**	**29 771 768**	**27 065 244**	**24 604 767**	**22 367 970**	**20 334 518**	**18 485 926**	**16 805 387**
		TOTAL			**82 158 403**	**180 815 959**	**164 378 145**	**149 434 677**	**135 849 707**	**123 499 733**	**46 376 277**	**42 160 251**	**38 327 501**	**34 843 183**	**31 675 621**	**28 796 019**	**26 178 199**	**23 798 363**	**21 634 875**	**19 668 068**
		REDUCED PAYMENT			**2 995 287**	**17 587 359**	**29 501 573**	**39 104 216**	**46 717 109**	**49 885 493**	**46 148 024**	**41 952 749**	**38 138 863**	**34 671 694**	**31 519 721**	**28 654 292**	**26 049 357**	**23 681 233**	**21 528 394**	**19 571 267**
		ADDITIONAL INCOME			**0**	**26 614 692**	**36 292 761**	**43 991 226**	**49 990 029**	**45 445 481**	**41 314 074**	**37 558 249**	**34 143 863**	**31 039 875**	**28 218 068**	**25 652 789**	**23 320 718**	**21 200 652**	**19 273 320**	**17 521 200**

				10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Pressure management			m3/annum		0	891 922	1 621 676	2 211 376	2 680 456	3 045 973	2 769 066	2 517 333	2 288 484	2 080 440	1 891 309	1 719 372	1 563 066	1 420 969	1 291 790	1 174 354
Mains replacement			m3/annum		448 249	814 999	1 111 362	1 347 105	1 530 801	1 391 637	1 265 125	1 150 114	1 045 558	950 507	864 097	785 543	714 130	649 209	590 190	536 536
Active and passive leakage control			m3/annum		550 180	1 000 327	1 364 082	1 653 433	1 878 901	1 708 092	1 552 811	1 411 646	1 283 315	1 166 650	1 060 591	964 173	876 521	796 838	724 398	658 543
Retrofitting & removal of wasteful devices			m3/annum		0	1 322 253	2 404 097	3 278 314	3 973 714	4 515 584	4 105 076	3 731 887	3 392 625	3 084 204	2 803 822	2 548 929	2 317 208	2 106 553	1 915 048	1 740 953
Water Wise Gardening			m3/annum		0	976 616	1 775 666	2 421 363	2 934 985	3 335 210	3 032 009	2 756 372	2 505 793	2 277 993	2 070 903	1 882 639	1 711 490	1 555 900	1 414 455	1 285 868
Meter reading, billing & cost recovery			m3/annum		0	2 217 891	4 032 529	5 498 903	6 665 337	7 574 247	6 885 679	6 259 708	5 690 644	5 173 313	4 703 011	4 275 465	3 886 786	3 533 442	3 212 220	2 920 200
Water Use Efficiency			m3/annum		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum		0	856 336	1 556 975	2 123 148	2 573 513	2 632 002	2 658 587	2 416 898	2 197 180	1 997 436	1 815 851	1 650 774	1 500 703	1 364 276	1 240 251	1 127 501
Total			**m3/annum**		**998 429**	**8 080 344**	**13 866 387**	**18 533 642**	**22 237 707**	**24 202 744**	**22 268 354**	**20 243 958**	**18 403 598**	**16 730 544**	**15 209 585**	**13 826 896**	**12 569 905**	**11 427 186**	**10 388 351**	**9 443 956**
Unit reference values																				
All interventions					**82.3**	**22.4**	**11.9**	**8.1**	**6.1**	**5.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management						6.1	3.1	2.0	1.5	1.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement					17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC					27.9	14.0	9.3	7.0	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices						5.6	2.8	1.9	1.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening						85.2	42.6	28.4	21.3	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery						4.8	2.4	1.6	1.2	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management						21.2	10.6	7.1	5.3	4.7	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Awareness campaigns & Efficiency						102.9	51.5	34.3	25.7	22.9	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

			Discount rate :	10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost			**Unit**		**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Sectorisation		CAPEX	Rands		140 683	127 894	116 267	105 697	96 088	87 353	79 412	72 193	65 630	59 663	54 239	49 309	44 826	40 751	37 046	33 678
		OPEX	Rands		175 854	159 867	145 334	132 122	120 111	109 191	99 265	90 241	82 037	74 579	67 799	61 636	56 032	50 939	46 308	42 098
Pressure management		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		437 009	397 281	361 164	328 331	298 483	271 348	246 680	224 255	203 868	185 334	168 486	153 169	139 244	126 586	115 078	104 616
Mains replacement		CAPEX	Rands		1 670 412	1 518 557	1 380 506	1 255 006	1 140 914	1 037 195	942 904	857 186	779 260	708 418	644 016	585 469	532 245	483 859	439 872	399 883
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		3 340 825	3 037 114	2 761 012	2 510 011	2 281 828	2 074 389	1 885 809	1 714 371	1 558 519	1 416 836	1 288 033	1 170 939	1 064 490	967 718	879 744	799 767
Retrofitting & removal of wasteful devices		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands		791 342	719 402	654 002	594 547	540 497	491 361	446 692	406 084	369 167	335 606	305 097	277 361	252 146	229 224	208 385	189 441
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		10 551 230	9 592 028	8 720 025	7 927 296	7 206 632	6 551 484	5 955 894	5 414 450	4 922 227	4 474 752	4 067 956	3 698 142	3 361 947	3 056 316	2 778 469	2 525 881
Water audits / manage KPI's		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		633 074	575 522	523 202	475 638	432 398	393 089	357 354	324 867	295 334	268 485	244 077	221 889	201 717	183 379	166 708	151 553
Management meters		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		139 633	126 939	115 399	104 908	95 371	86 701	78 819	71 654	65 140	59 218	53 834	48 940	44 491	40 447	36 770	33 427
Consumer meters		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**			**2 602 438**	**2 365 853**	**2 150 775**	**1 955 250**	**1 777 500**	**1 615 909**	**1 469 008**	**1 335 462**	**1 214 056**	**1 103 688**	**1 003 352**	**912 139**	**829 217**	**753 834**	**685 303**	**623 003**
		OPEX			**15 277 624**	**13 888 750**	**12 626 136**	**11 478 305**	**10 434 823**	**9 486 203**	**8 623 821**	**7 839 837**	**7 127 125**	**6 479 204**	**5 890 186**	**5 354 714**	**4 867 922**	**4 425 384**	**4 023 076**	**3 657 342**
		TOTAL			**17 880 062**	**16 254 602**	**14 776 911**	**13 433 555**	**12 212 323**	**11 102 112**	**10 092 829**	**9 175 299**	**8 341 181**	**7 582 892**	**6 893 538**	**6 266 853**	**5 697 139**	**5 179 217**	**4 708 379**	**4 280 345**
		REDUCED PAYMENT			**17 792 061**	**16 174 601**	**14 704 183**	**13 367 439**	**12 152 217**	**11 047 470**	**10 043 155**	**9 130 141**	**8 300 128**	**7 545 571**	**6 859 610**	**6 236 009**	**5 669 099**	**5 153 726**	**4 685 206**	**4 259 278**
		ADDITIONAL INCOME			**15 928 364**	**14 480 331**	**13 163 937**	**11 967 216**	**10 879 287**	**9 890 261**	**8 991 146**	**8 173 769**	**7 430 699**	**6 755 181**	**6 141 074**	**5 582 794**	**5 075 268**	**4 613 880**	**4 194 436**	**3 813 124**

				10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving			**Unit**		**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Pressure management			m3/annum		1 067 595	970 541	882 310	802 100	729 182	662 892	602 629	547 845	498 041	452 764	411 604	374 185	340 169	309 244	281 131	255 574
Mains replacement			m3/annum		487 760	443 419	403 108	366 462	333 147	302 861	275 328	250 298	227 544	206 858	188 053	170 957	155 416	141 287	128 443	116 766
Active and passive leakage control			m3/annum		598 676	544 251	494 773	449 794	408 904	371 731	337 937	307 215	279 287	253 897	230 815	209 832	190 757	173 415	157 650	143 318
Retrofitting & removal of wasteful devices			m3/annum		1 582 685	1 438 804	1 308 004	1 189 094	1 080 995	982 723	893 384	812 167	738 334	671 213	610 193	554 721	504 292	458 447	416 770	378 882
Water Wise Gardening			m3/annum		1 168 971	1 062 701	966 092	878 265	798 423	725 839	659 854	599 867	545 333	495 758	450 689	409 717	372 470	338 609	307 827	279 842
Meter reading, billing & cost recovery			m3/annum		2 654 727	2 413 388	2 193 990	1 994 536	1 813 214	1 648 377	1 498 524	1 362 295	1 238 450	1 125 864	1 023 512	930 466	845 878	768 980	699 073	635 521
Water Use Efficiency			m3/annum		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum		1 025 001	931 819	847 108	770 098	700 089	636 445	578 586	525 987	478 170	434 700	395 182	359 256	326 597	296 906	269 915	245 377
Total			**m3/annum**		**8 585 414**	**7 804 922**	**7 095 384**	**6 450 349**	**5 863 954**	**5 330 867**	**4 846 243**	**4 405 675**	**4 005 159**	**3 641 054**	**3 310 049**	**3 009 135**	**2 735 578**	**2 486 889**	**2 260 808**	**2 055 280**

Unit reference values																				
All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management				2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Awareness campaigns & Efficiency				20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 10%

Net present cost			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Sectorisation		CAPEX	Rands	30 617	27 833	25 303	23 003	20 912	19 011	17 282	15 711	14 283	12 984	11 804	10 731	9 755	8 869	7 022 098	152 654
		OPEX	Rands	38 271	34 792	31 629	28 754	26 140	23 763	21 603	19 639	17 854	16 231	14 755	13 414	12 194	11 086	8 777 623	190 818
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15 163 147	329 634
		OPEX	Rands	95 106	86 460	78 600	71 454	64 959	59 053	53 685	48 804	44 368	40 334	36 667	33 334	30 304	27 549	21 812 992	474 195
Mains replacement		CAPEX	Rands	363 530	330 482	300 438	273 126	248 296	225 724	205 203	186 549	169 590	154 172	140 157	127 415	115 832	105 302	83 377 482	1 812 554
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	727 061	660 964	600 877	546 252	496 592	451 448	410 407	373 097	339 179	308 345	280 313	254 830	231 664	210 604	166 754 964	3 625 108
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30 631 212	665 896
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	172 219	156 563	142 330	129 391	117 628	106 935	97 213	88 376	80 341	73 038	66 398	60 362	54 874	49 886	39 499 303	858 680
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 296 255	2 087 505	1 897 732	1 725 210	1 568 373	1 425 794	1 296 176	1 178 342	1 071 220	973 836	885 306	804 823	731 658	665 143	526 657 371	11 449 073
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	137 775	125 250	113 864	103 513	94 102	85 548	77 771	70 701	64 273	58 430	53 118	48 289	43 899	39 909	31 599 442	686 944
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18 953 934	412 042
		OPEX	Rands	30 388	27 626	25 114	22 831	20 756	18 869	17 153	15 594	14 176	12 888	11 716	10 651	9 683	8 802	6 969 672	151 515
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30 631 212	665 896
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	347 153 730	7 546 820
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**566 366**	**514 878**	**468 071**	**425 519**	**386 836**	**351 669**	**319 699**	**290 635**	**264 214**	**240 195**	**218 359**	**198 508**	**180 462**	**164 056**	**572 432 117**	**12 444 176**
		OPEX		**3 324 856**	**3 022 597**	**2 747 815**	**2 498 014**	**2 270 922**	**2 064 474**	**1 876 795**	**1 706 177**	**1 551 070**	**1 410 064**	**1 281 876**	**1 165 342**	**1 059 402**	**963 092**	**762 572 065**	**16 577 654**
		TOTAL		**3 891 222**	**3 537 475**	**3 215 886**	**2 923 533**	**2 657 757**	**2 416 143**	**2 196 494**	**1 996 812**	**1 815 284**	**1 650 258**	**1 500 235**	**1 363 850**	**1 239 863**	**1 127 149**	**1 335 004 182**	**29 021 830**
		REDUCED PAYMENT		**3 872 071**	**3 520 064**	**3 200 059**	**2 909 144**	**2 644 676**	**2 404 251**	**2 185 683**	**1 986 985**	**1 806 350**	**1 642 136**	**1 492 851**	**1 357 137**	**1 233 761**	**1 121 601**	**682 203 291**	**14 830 506**
		ADDITIONAL INCOME		**3 466 476**	**3 151 342**	**2 864 856**	**2 604 415**	**2 367 650**	**2 152 409**	**1 956 735**	**1 778 850**	**1 617 137**	**1 470 124**	**1 336 477**	**1 214 979**	**1 104 526**	**1 004 115**	**646 747 857**	**14 059 736**

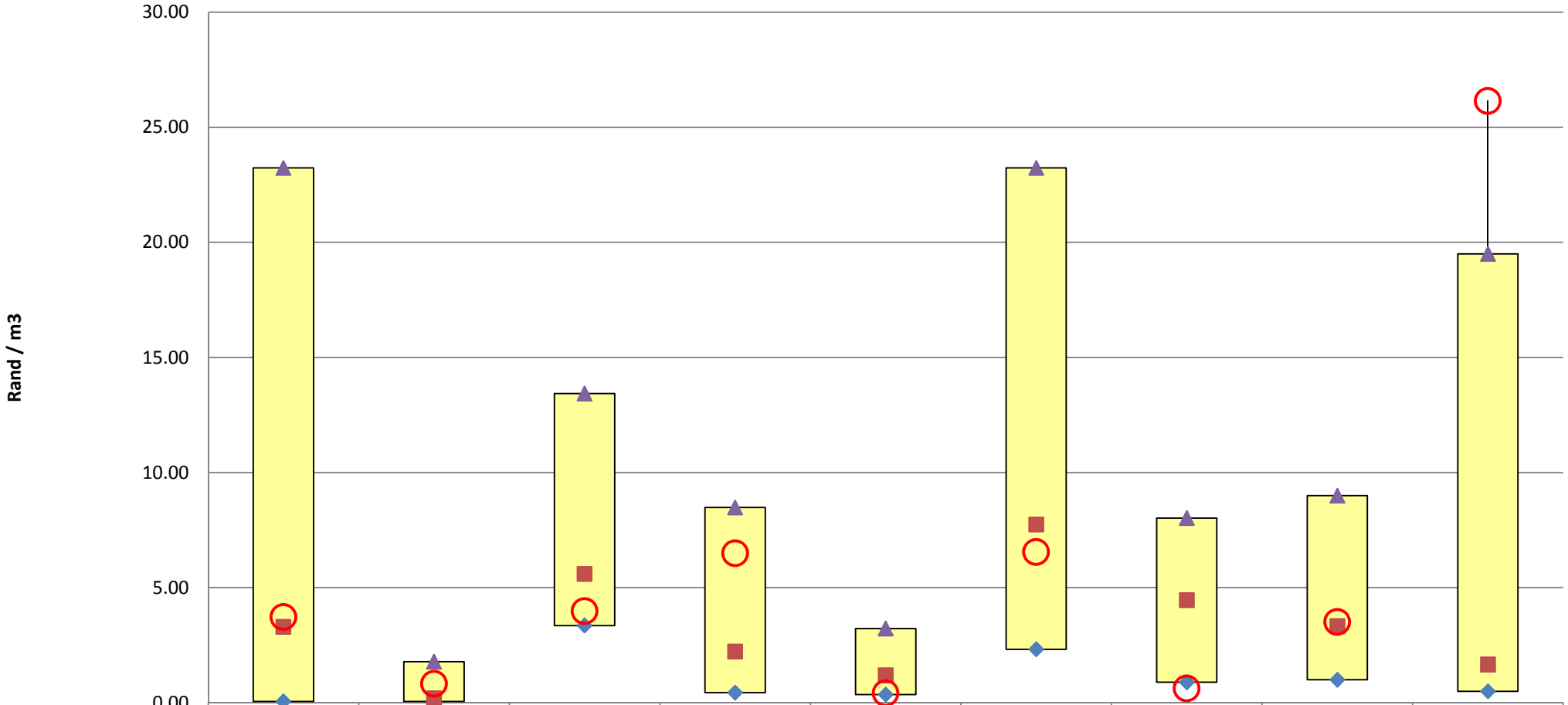
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Net present saving			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Pressure management			m3/annum	232 340	211 218	192 016	174 560	158 691	144 265	131 150	119 227	108 388	98 535	89 577	81 434	74 031	67 301	**40 238 125**	**874 742**
Mains replacement			m3/annum	106 151	96 501	87 728	79 753	72 502	65 911	59 919	54 472	49 520	45 018	40 926	37 205	33 823	30 748	**20 253 046**	**440 284**
Active and passive leakage control			m3/annum	130 289	118 445	107 677	97 888	88 989	80 899	73 545	66 859	60 781	55 255	50 232	45 666	41 514	37 740	**24 858 533**	**540 403**
Retrofitting & removal of wasteful devices			m3/annum	344 438	313 126	284 660	258 782	235 256	213 869	194 426	176 751	160 683	146 075	132 796	120 724	109 749	99 771	**59 652 084**	**1 296 784**
Water Wise Gardening			m3/annum	254 402	231 275	210 250	191 136	173 760	157 964	143 603	130 549	118 680	107 891	98 083	89 166	81 060	73 691	**44 059 028**	**957 805**
Meter reading, billing & cost recovery			m3/annum	577 746	525 224	477 476	434 069	394 608	358 735	326 123	296 475	269 523	245 021	222 746	202 496	184 088	167 352	**100 057 852**	**2 175 171**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	223 070	202 791	184 355	167 596	152 360	138 509	125 917	114 470	104 064	94 603	86 003	78 185	71 077	64 615	**38 340 281**	**833 484**
Total			**m3/annum**	**1 868 436**	**1 698 578**	**1 544 162**	**1 403 784**	**1 276 167**	**1 160 152**	**1 054 684**	**958 803**	**871 639**	**792 399**	**720 363**	**654 876**	**595 341**	**541 219**	**327 458 949**	**7 118 673**

Unit reference values

All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**4.1**	**4.1**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.9	0.9
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.1	4.1
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	6.7	6.7
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	7.9
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.7
Management				2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.8	3.8
Awareness campaigns & Efficiency				20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	27.5	27.5

KZN METRO WC/WDM POTENTIAL ASSESSMENT
eThekwini Metro Unit Reference Values - Scenario 1



	All interventions	Pressure management	Mains replacement	Leak detection & repair	Retrofitting	Water Wise	Metering and billing	Management	Awareness campaigns
Ideal conditions	0.06	0.06	3.36	0.44	0.36	2.32	0.89	1.00	0.50
Expected conditions	3.30	0.21	5.60	2.23	1.20	7.74	4.46	3.33	1.67
eThekwini	3.73	0.83	3.99	6.50	0.43	6.55	0.63	3.52	26.15
Poor conditions	23.23	1.79	13.43	8.49	3.23	23.23	8.03	9.00	19.50

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality			Unit	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**
Billed consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	210 558 455	206 261 344	201 964 233	197 667 121	193 370 010	189 072 899	184 775 787	180 478 676	176 181 565	171 884 453
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	210 558 455	206 261 344	201 964 233	197 667 121	193 370 010	189 072 899	184 775 787	180 478 676	176 181 565	171 884 453
Unbilled potential paid consumption	% of system input volume	4.0%	m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Total potential revenue water		75%	**m3/annum**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**225 665 813**	**221 368 702**	**217 071 590**	**212 774 479**	**208 477 368**	**204 180 256**	**199 883 145**	**195 586 034**	**191 288 922**	**186 991 811**
Non-revenue water			**m3/annum**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**79 294 196**	**83 591 307**	**87 888 419**	**92 185 530**	**96 482 641**	**100 779 753**	**105 076 864**	**109 373 975**	**113 671 087**	**117 968 198**
Unbilled consumption	% of system input volume	1.0%	m3/annum	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600
Apparent losses		20.0%	m3/annum	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	15 858 839	16 718 261	17 577 684	18 437 106	19 296 528	20 155 951	21 015 373	21 874 795	22 734 217	23 593 640
Unavoidable annual real losses		2.0	m3/annum	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%
Potential saving (Real losses)			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**30 689 036**	**34 126 725**	**37 564 414**	**41 002 103**	**44 439 792**	**47 877 481**	**51 315 170**	**54 752 859**	**58 190 548**	**61 628 237**
Target Sysem Input Volume			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**274 270 973**	**270 833 284**	**267 395 595**	**263 957 906**	**260 520 217**	**257 082 528**	**253 644 839**	**250 207 150**	**246 769 461**	**243 331 772**
% Reduction			**%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**10%**	**11%**	**12%**	**13%**	**15%**	**16%**	**17%**	**18%**	**19%**	**20%**
% return flow			m3/annum	0%	50%	55%	60%	65%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Return flow			m3/annum	0	138 854 331	152 739 764	166 625 197	180 510 631	194 396 064	191 989 681	189 583 299	187 176 917	184 770 534	182 364 152	179 957 770	177 551 387	175 145 005	172 738 623	170 332 240
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	20%	m3/annum	0	981 114	1 962 228	2 943 342	3 924 456	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570
Mains replacement	Replace _% per annum, Saving 200l/km/h	5%	m3/annum	448 249	896 498	1 344 748	1 792 997	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	550 180	1 100 360	1 650 540	2 200 719	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	10	m3/annum	0	969 652	1 939 305	2 908 957	3 878 609	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262
Water Wise Gardening	Reduce billed consumption by _% for 1/3	7.5%	m3/annum	0	1 074 278	2 148 556	3 222 834	4 297 111	5 371 389	5 263 961	5 156 534	5 049 106	4 941 678	4 834 250	4 726 822	4 619 395	4 511 967	4 404 539	4 297 111
Total direct interventions			**m3/annum**	**998 429**	**5 021 902**	**9 045 375**	**13 068 849**	**17 092 322**	**20 117 366**	**20 009 938**	**19 902 510**	**19 795 082**	**19 687 655**	**19 580 227**	**19 472 799**	**19 365 371**	**19 257 944**	**19 150 516**	**19 043 088**
Indirect measureable interventions																			
Sectorisation																			
Efficiency																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets				0	941 970	1 883 940	2 825 910	3 767 880	7 133 981	6 467 928	5 973 761	5 651 477	5 501 078	5 522 564	5 715 934	6 081 188	6 618 327	7 327 351	8 208 259
% improvement per annum			%	0.0%	0.3%	0.6%	0.9%	1.2%	2.3%	3.5%	4.7%	5.8%	7.0%	8.2%	9.3%	10.5%	11.6%	12.8%	14.0%
Total indirect interventions			**m3/annum**	**0**	**941 970**	**1 883 940**	**2 825 910**	**3 767 880**	**7 133 981**	**10 679 098**	**14 224 214**	**17 769 331**	**21 314 448**	**24 859 565**	**28 404 682**	**31 949 799**	**35 494 916**	**39 040 032**	**42 585 149**
Total estimated savings			**m3/annum**	**998 429**	**5 963 872**	**10 929 315**	**15 894 758**	**20 860 202**	**27 251 347**	**30 689 036**	**34 126 725**	**37 564 414**	**41 002 103**	**44 439 792**	**47 877 481**	**51 315 170**	**54 752 859**	**58 190 548**	**61 628 237**
System Input Volume with WCWDM			**m3/annum**	**303 961 580**	**298 996 137**	**294 030 694**	**289 065 251**	**284 099 807**	**277 708 662**	**274 270 973**	**270 833 284**	**267 395 595**	**263 957 906**	**260 520 217**	**257 082 528**	**253 644 839**	**250 207 150**	**246 769 461**	**243 331 772**
% Reduction			**%**	**0%**	**2%**	**4%**	**5%**	**7%**	**9%**	**10%**	**11%**	**12%**	**13%**	**15%**	**16%**	**17%**	**18%**	**19%**	**20%**
Meter reading, billing & cost recovery			**m3/annum**	**0**	**2 439 680**	**4 879 360**	**7 319 040**	**9 758 720**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**
Water Use Efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**4 211 169**	**8 250 454**	**12 117 854**	**15 813 370**	**19 337 001**	**22 688 748**	**25 868 610**	**28 876 588**	**31 712 682**	**34 376 891**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435
		OPEX	Rands	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044
Pressure management		CAPEX	Rands		5 000 000	5 000 000	5 000 000	5 000 000	5 000 000										
		OPEX	Rands	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands		8 080 436	8 080 436	8 080 436	8 080 436	8 080 436										
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands																
	R 5 / consumer / month	OPEX	Rands		48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands		5 000 000	5 000 000	5 000 000	5 000 000	5 000 000										
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands		8 080 436	8 080 436	8 080 436	8 080 436	8 080 436										
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening	R 2000 per customer	CAPEX	Rands		91 578 280	91 578 280	91 578 280	91 578 280	91 578 280										
		OPEX	Rands																
TOTAL COSTS		**CAPEX**	Rands	**11 958 131**	**129 697 284**	**129 697 284**	**129 697 284**	**129 697 284**	**129 697 284**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**
		OPEX	Rands	**21 717 653**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**
		TOTAL	Rands	**33 675 784**	**199 897 555**	**199 897 555**	**199 897 555**	**199 897 555**	**199 897 555**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**
		REDUCED PA	R 3.00	**2 995 287**	**17 891 617**	**32 787 946**	**47 684 275**	**62 580 605**	**81 754 040**	**92 067 107**	**102 380 174**	**112 693 241**	**123 006 309**	**133 319 376**	**143 632 443**	**153 945 510**	**164 258 577**	**174 571 645**	**184 884 712**
		ADDITIONAL	R 6.00	**0**	**14 638 080**	**29 276 161**	**43 914 241**	**58 552 322**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**
		CBR		**11.24**	**11.17**	**6.10**	**4.19**	**3.19**	**2.45**	**1.42**	**1.28**	**1.16**	**1.06**	**0.98**	**0.91**	**0.85**	**0.80**	**0.75**	**0.71**

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality			Unit	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**
Billed consumption			m3/annum	166 513 064	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	166 513 064	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675
Unbilled potential paid consumption	% of system input volume	4.0%	m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Total potential revenue water		75%	**m3/annum**	**181 620 422**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**
Non-revenue water			**m3/annum**	**123 339 587**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**
Unbilled consumption	% of system input volume	1.0%	m3/annum	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600
Apparent losses		20.0%	m3/annum	24 667 917	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195
Unavoidable annual real losses		2.0	m3/annum	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721
% inefficient use reduction			%	23%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Potential saving (Real losses)			**m3/annum**	**65 925 349**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**
Target Sysem Input Volume			**m3/annum**	**239 034 660**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**
% Reduction			**%**	**22%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**
% return flow			m3/annum	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Return flow			m3/annum	167 324 262	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	20%	m3/annum	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570
Mains replacement	Replace _% per annum, Saving 200l/km/h	5%	m3/annum	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	10	m3/annum	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262
Water Wise Gardening	Reduce billed consumption by _% for 1/3	7.5%	m3/annum	4 162 827	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542
Total direct interventions			**m3/annum**	**18 908 803**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**
Indirect measureable interventions																			
Sectorisation																			
Efficiency																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets				9 551 106	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523
% improvement per annum			%	15.4%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%
Total indirect interventions			**m3/annum**	**47 016 545**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**
Total estimated savings			**m3/annum**	**65 925 349**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**
System Input Volume with WCWDM			**m3/annum**	**239 034 660**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**
% Reduction			**%**	**22%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**
Meter reading, billing & cost recovery			**m3/annum**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**
Water Use Efficiency			**m3/annum**	**37 465 439**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435
		OPEX	Rands	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044
Pressure management		CAPEX	Rands																
		OPEX	Rands	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands																
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands																
	R 5 / consumer / month	OPEX	Rands	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening	R 2000 per customer	CAPEX	Rands																
		OPEX	Rands																
TOTAL COSTS		**CAPEX**	Rands	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**
		OPEX	Rands	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**
		TOTAL	Rands	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**
		REDUCED PA	R 3.00	**197 776 046**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**
		ADDITIONAL	R 6.00	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**
		CBR		**0.66**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
System input volume without WCWDM			**m3/annum**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**14 028 160 414**	**304 960 009**
Billed consumption			m3/annum	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	8 040 969 584	174 803 687
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	161 141 675	8 040 969 584	174 803 687
Unbilled potential paid consumption	% of system input volume	4.0%	m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	561 126 417	12 198 400
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	133 812 027	2 908 957
Total potential revenue water		75%	**m3/annum**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**176 249 033**	**8 735 908 028**	**189 911 044**
Non-revenue water			**m3/annum**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**128 710 976**	**5 292 252 386**	**115 048 965**
Unbilled consumption	% of system input volume	1.0%	m3/annum	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	140 281 604	3 049 600
Apparent losses		20.0%	m3/annum	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	25 742 195	1 058 450 477	23 009 793
Unavoidable annual real losses		2.0	m3/annum	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	1 366 049 175	29 696 721
% inefficient use reduction			%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%		
Potential saving (Real losses)			**m3/annum**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**2 727 471 130**	**59 292 851**
Target Sysem Input Volume			**m3/annum**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**11 300 689 284**	**245 667 158**
% Reduction			**%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**19%**	**19%**
% return flow			m3/annum	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	54%	54%
Return flow			m3/annum	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	164 316 284	7 577 232 104	164 722 437
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	20%	m3/annum	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	210 939 492	4 585 641
Mains replacement	Replace_% per annum, Saving 200l/km/h	5%	m3/annum	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	98 614 824	2 143 801
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	121 039 565	2 631 295
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	10	m3/annum	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	208 475 260	4 532 071
Water Wise Gardening	Reduce billed consumption by _% for 1/3	7.5%	m3/annum	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	4 028 542	184 910 072	4 019 784
Total direct interventions			**m3/annum**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**18 774 519**	**823 979 213**	**17 912 592**
Indirect measureable interventions																			
Sectorisation																			
Efficiency																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets				11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	11 162 523	412 885 811	8 975 778
% improvement per annum			%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	16.9%	13%	13%
Total indirect interventions			**m3/annum**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**51 447 941**	**1 821 881 760**	**39 606 125**
Total estimated savings			**m3/annum**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**70 222 460**	**2 645 860 973**	**57 518 717**
System Input Volume with WCWDM			**m3/annum**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**234 737 549**	**11 382 299 441**	**247 441 292**
% Reduction			**%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**23%**	**19%**	**19%**
Meter reading, billing & cost recovery			**m3/annum**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**12 198 400**	**524 531 215**	**11 402 853**
Water Use Efficiency			**m3/annum**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**40 285 419**	**1 408 995 950**	**30 630 347**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	646 435	**29 736 006**	**646 435**
		OPEX	Rands	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	**37 170 008**	**808 044**
Pressure management		CAPEX	Rands															**25 000 000**	**5 000 000**
		OPEX	Rands	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	**92 370 008**	**2 008 044**
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	**353 073 000**	**7 675 500**
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	**706 146 000**	**15 351 000**
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands															**40 402 182**	**8 080 436**
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	**167 265 034**	**3 636 196**
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Education and awareness campaigns		CAPEX	Rands																
	R 5 / consumer / month	OPEX	Rands	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	96 965 237	**4 121 022 580**	**91 578 280**
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	**133 812 027**	**2 908 957**
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands															**25 000 000**	**5 000 000**
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	**29 514 002**	**641 609**
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands															**40 402 182**	**8 080 436**
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Water Wise Gardening	R 2000 per customer	CAPEX	Rands																
		OPEX	Rands																
TOTAL COSTS		**CAPEX**	Rands	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**11 958 131**	**1 138 769 802**	**24 755 865**
		OPEX	Rands	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**118 682 890**	**5 120 034 624**	**111 305 101**
		TOTAL	Rands	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**130 641 022**	**6 258 804 426**	**136 060 966**
		REDUCED PA	R 3.00	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**210 667 380**	**7 937 582 920**	**172 556 150**
		ADDITIONAL	R 6.00	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**3 147 187 293**	**68 417 115**
		CBR		**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.62**	**0.79**	**0.79**

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 6%

Net present cost			Unit	0 2006-07	1 2007-08	2 2008-09	3 2009-10	4 2010-11	5 2011-12	6 2012-13	7 2013-14	8 2014-15	9 2015-16	10 2016-17	11 2017-18	12 2018-19	13 2019-20	14 2020-21	15 2021-22
Sectorisation		CAPEX	Rands	646 435	609 844	575 325	542 759	512 037	483 054	455 711	429 916	405 581	382 624	360 966	340 534	321 258	303 074	285 919	269 735
		OPEX	Rands	808 044	762 305	719 156	678 449	640 046	603 817	569 639	537 395	506 977	478 280	451 207	425 667	401 573	378 842	357 398	337 168
Pressure management		CAPEX	Rands	0	4 716 981	4 449 982	4 198 096	3 960 468	3 736 291	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 008 044	1 894 381	1 787 152	1 685 992	1 590 559	1 500 527	1 415 592	1 335 464	1 259 871	1 188 558	1 121 281	1 057 812	997 936	941 449	888 160	837 886
Mains replacement		CAPEX	Rands	7 675 500	7 241 038	6 831 168	6 444 498	6 079 715	5 735 580	5 410 925	5 104 646	4 815 704	4 543 117	4 285 959	4 043 358	3 814 488	3 598 574	3 394 881	3 202 718
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	15 351 000	14 482 075	13 662 335	12 888 996	12 159 430	11 471 160	10 821 849	10 209 292	9 631 407	9 086 233	8 571 918	8 086 715	7 628 977	7 197 148	6 789 762	6 405 436
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	7 623 053	7 191 560	6 784 490	6 400 462	6 038 172	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	3 636 196	3 430 374	3 236 202	3 053 021	2 880 208	2 717 177	2 563 375	2 418 278	2 281 395	2 152 259	2 030 433	1 915 503	1 807 078	1 704 791	1 608 293	1 517 258
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	45 738 319	43 149 358	40 706 941	38 402 775	36 229 033	68 356 666	64 487 421	60 837 189	57 393 575	54 144 882	51 080 077	48 188 752	45 461 087	42 887 818	40 460 206
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 908 957	2 744 299	2 588 961	2 442 416	2 304 166	2 173 742	2 050 700	1 934 623	1 825 116	1 721 807	1 624 346	1 532 402	1 445 663	1 363 833	1 286 635	1 213 806
Management meters		CAPEX	Rands	0	4 716 981	4 449 982	4 198 096	3 960 468	3 736 291	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	641 609	605 291	571 029	538 707	508 214	479 447	452 309	426 706	402 553	379 767	358 271	337 991	318 860	300 811	283 784	267 721
Consumer meters		CAPEX	Rands	0	7 623 053	7 191 560	6 784 490	6 400 462	6 038 172	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	86 394 603	81 504 343	76 890 889	72 538 575	68 432 618	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**11 958 131**	**122 355 928**	**115 430 121**	**108 896 340**	**102 732 397**	**96 917 355**	**8 430 011**	**7 952 840**	**7 502 680**	**7 078 000**	**6 677 358**	**6 299 394**	**5 942 825**	**5 606 439**	**5 289 093**	**4 989 710**
		OPEX		**21 717 653**	**66 226 671**	**62 477 992**	**58 941 502**	**55 605 190**	**52 457 727**	**83 666 754**	**78 930 900**	**74 463 114**	**70 248 220**	**66 271 906**	**62 520 666**	**58 981 760**	**55 643 170**	**52 493 557**	**49 522 223**
		TOTAL		**33 675 784**	**188 582 599**	**177 908 113**	**167 837 842**	**158 337 587**	**149 375 082**	**92 096 765**	**86 883 741**	**81 965 793**	**77 326 220**	**72 949 264**	**68 820 060**	**64 924 585**	**61 249 609**	**57 782 650**	**54 511 934**
		REDUCED PAYMENT		**2 995 287**	**16 878 883**	**29 181 155**	**40 036 637**	**49 569 700**	**61 091 374**	**64 903 677**	**68 088 663**	**70 705 134**	**72 807 245**	**74 444 843**	**75 663 779**	**76 506 202**	**77 010 831**	**77 213 207**	**77 145 930**
		ADDITIONAL INCOME		**0**	**13 809 510**	**26 055 679**	**36 871 244**	**46 378 923**	**54 692 126**	**51 596 345**	**48 675 798**	**45 920 564**	**43 321 287**	**40 869 138**	**38 555 791**	**36 373 388**	**34 314 517**	**32 372 185**	**30 539 798**

6%

Net present saving			Unit	0 2006-07	1 2007-08	2 2008-09	3 2009-10	4 2010-11	5 2011-12	6 2012-13	7 2013-14	8 2014-15	9 2015-16	10 2016-17	11 2017-18	12 2018-19	13 2019-20	14 2020-21	15 2021-22
Pressure management			m3/annum	0	925 579	1 746 376	2 471 286	3 108 536	3 665 727	3 458 233	3 262 484	3 077 815	2 903 599	2 739 244	2 584 193	2 437 918	2 299 922	2 169 738	2 046 923
Mains replacement			m3/annum	448 249	845 753	1 196 821	1 505 435	1 775 277	1 674 789	1 579 990	1 490 557	1 406 185	1 326 590	1 251 500	1 180 660	1 113 831	1 050 784	991 305	935 194
Active and passive leakage control			m3/annum	550 180	1 038 075	1 468 974	1 847 766	2 178 970	2 055 632	1 939 275	1 829 505	1 725 948	1 628 253	1 536 088	1 449 139	1 367 113	1 289 729	1 216 725	1 147 854
Retrofitting & removal of wasteful devices			m3/annum	0	914 766	1 725 974	2 442 416	3 072 222	3 622 903	3 417 833	3 224 371	3 041 859	2 869 679	2 707 244	2 554 004	2 409 438	2 273 054	2 144 391	2 023 010
Water Wise Gardening			m3/annum	0	1 013 470	1 912 207	2 705 953	3 403 715	4 013 814	3 710 885	3 429 389	3 167 871	2 924 972	2 699 420	2 490 031	2 295 698	2 115 386	1 948 132	1 793 034
Meter reading, billing & cost recovery			m3/annum	0	2 301 585	4 342 613	6 145 207	7 729 821	9 115 354	8 599 391	8 112 633	7 653 427	7 220 214	6 811 523	6 425 965	6 062 231	5 719 086	5 395 364	5 089 966
Water Use Efficiency			m3/annum	0	0	0	0	0	0	2 968 708	5 487 023	7 602 891	9 359 909	10 797 680	11 952 149	12 855 907	13 538 471	14 026 550	14 344 275
Other			m3/annum	0	888 651	1 676 700	2 372 688	2 984 514	5 330 925	7 528 342	9 459 915	11 148 698	12 615 989	13 881 451	14 963 232	15 878 071	16 641 402	17 267 444	17 769 295
Total			**m3/annum**	**998 429**	**7 927 879**	**14 069 665**	**19 490 753**	**24 253 054**	**29 479 146**	**33 202 658**	**36 295 877**	**38 824 697**	**40 849 205**	**42 424 151**	**43 599 374**	**44 420 205**	**44 927 834**	**45 159 649**	**45 149 552**

Unit reference values

All interventions				**33.7**	**23.8**	**12.6**	**8.6**	**6.5**	**5.1**	**2.8**	**2.4**	**2.1**	**1.9**	**1.7**	**1.6**	**1.5**	**1.4**	**1.3**	**1.2**
Pressure management					7.1	3.6	2.4	1.8	1.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement				17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				27.9	14.0	9.3	7.0	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices					8.3	4.2	2.8	2.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					85.2	42.6	28.4	21.3	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					4.8	2.4	1.6	1.2	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management					21.2	10.6	7.1	5.3	2.8	0.9	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.2
Awareness campaigns & Efficiency					102.9	51.5	34.3	25.7	13.6	10.2	6.3	4.6	3.7	3.1	2.6	2.3	2.1	1.9	1.7

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 6%

Net present cost			Unit	16 2022-23	17 2023-24	18 2024-25	19 2025-26	20 2026-27	21 2027-28	22 2028-29	23 2029-30	24 2030-31	25 2031-32	26 2032-33	27 2033-34	28 2034-35	29 2035-36	30 2036-37	31 2037-38
Sectorisation		CAPEX	Rands	254 467	240 063	226 474	213 655	201 561	190 152	179 389	169 235	159 656	150 618	142 093	134 050	126 462	119 304	112 551	106 180
		OPEX	Rands	318 083	300 079	283 093	267 069	251 952	237 690	224 236	211 544	199 569	188 273	177 616	167 562	158 078	149 130	140 689	132 725
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	790 459	745 716	703 506	663 685	626 117	590 677	557 242	525 700	495 944	467 871	441 388	416 404	392 834	370 598	349 621	329 831
Mains replacement		CAPEX	Rands	3 021 432	2 850 408	2 689 064	2 536 853	2 393 257	2 257 790	2 129 990	2 009 425	1 895 684	1 788 381	1 687 152	1 591 653	1 501 559	1 416 565	1 336 382	1 260 738
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	6 042 864	5 700 815	5 378 128	5 073 705	4 786 514	4 515 580	4 259 981	4 018 850	3 791 368	3 576 762	3 374 304	3 183 305	3 003 118	2 833 130	2 672 765	2 521 476
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	1 431 375	1 350 354	1 273 919	1 201 810	1 133 783	1 069 607	1 009 063	951 946	898 063	847 229	799 272	754 031	711 350	671 085	633 099	597 263
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	38 170 005	36 009 439	33 971 169	32 048 272	30 234 219	28 522 848	26 908 348	25 385 234	23 948 334	22 592 767	21 313 932	20 107 483	18 969 323	17 895 588	16 882 630	15 927 010
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 145 100	1 080 283	1 019 135	961 448	907 027	855 685	807 250	761 557	718 450	677 783	639 418	603 224	569 080	536 868	506 479	477 810
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	252 567	238 271	224 784	212 060	200 057	188 733	178 050	167 971	158 464	149 494	141 032	133 049	125 518	118 413	111 711	105 387
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**4 707 274**	**4 440 824**	**4 189 457**	**3 952 318**	**3 728 602**	**3 517 549**	**3 318 442**	**3 130 606**	**2 953 402**	**2 786 228**	**2 628 517**	**2 479 733**	**2 339 371**	**2 206 954**	**2 082 032**	**1 964 181**
		OPEX		**46 719 079**	**44 074 603**	**41 579 814**	**39 226 239**	**37 005 886**	**34 911 213**	**32 935 107**	**31 070 856**	**29 312 128**	**27 652 951**	**26 087 690**	**24 611 028**	**23 217 951**	**21 903 727**	**20 663 894**	**19 494 239**
		TOTAL		**51 426 353**	**48 515 427**	**45 769 271**	**43 178 557**	**40 734 488**	**38 428 762**	**36 253 549**	**34 201 462**	**32 265 530**	**30 439 179**	**28 716 207**	**27 090 761**	**25 557 322**	**24 110 681**	**22 745 925**	**21 458 420**
		REDUCED PAYMENT		**77 853 805**	**78 234 369**	**73 806 008**	**69 628 310**	**65 687 085**	**61 968 948**	**58 461 272**	**55 152 143**	**52 030 324**	**49 085 211**	**46 306 803**	**43 685 663**	**41 212 890**	**38 880 085**	**36 679 325**	**34 603 137**
		ADDITIONAL INCOME		**28 811 130**	**27 180 311**	**25 641 803**	**24 190 380**	**22 821 113**	**21 529 352**	**20 310 710**	**19 161 047**	**18 076 459**	**17 053 263**	**16 087 984**	**15 177 344**	**14 318 249**	**13 507 782**	**12 743 191**	**12 021 878**

6%

Net present saving			Unit	16 2022-23	17 2023-24	18 2024-25	19 2025-26	20 2026-27	21 2027-28	22 2028-29	23 2029-30	24 2030-31	25 2031-32	26 2032-33	27 2033-34	28 2034-35	29 2035-36	30 2036-37	31 2037-38
Pressure management			m3/annum	1 931 059	1 821 754	1 718 636	1 621 355	1 529 580	1 443 000	1 361 321	1 284 265	1 211 570	1 142 991	1 078 293	1 017 258	959 677	905 356	854 109	805 764
Mains replacement			m3/annum	882 258	832 319	785 207	740 761	698 831	659 275	621 957	586 752	553 540	522 207	492 648	464 763	438 455	413 637	390 224	368 136
Active and passive leakage control			m3/annum	1 082 881	1 021 586	963 760	909 208	857 743	809 192	763 389	720 178	679 413	640 956	604 675	570 448	538 159	507 697	478 959	451 849
Retrofitting & removal of wasteful devices			m3/annum	1 908 500	1 800 472	1 698 558	1 602 414	1 511 711	1 426 142	1 345 417	1 269 262	1 197 417	1 129 638	1 065 697	1 005 374	948 466	894 779	844 132	796 350
Water Wise Gardening			m3/annum	1 638 681	1 496 057	1 411 375	1 331 486	1 256 118	1 185 017	1 117 941	1 054 661	994 963	938 645	885 514	835 390	788 104	743 495	701 410	661 708
Meter reading, billing & cost recovery			m3/annum	4 801 855	4 530 052	4 273 634	4 031 730	3 803 519	3 588 225	3 385 118	3 193 508	3 012 743	2 842 211	2 681 331	2 529 557	2 386 375	2 251 297	2 123 865	2 003 646
Water Use Efficiency			m3/annum	14 748 131	14 960 571	14 113 746	13 314 855	12 561 184	11 850 174	11 179 409	10 546 612	9 949 634	9 386 447	8 855 139	8 353 905	7 881 042	7 434 946	7 014 100	6 617 075
Other			m3/annum	18 507 888	19 105 935	18 024 467	17 004 214	16 041 711	15 133 690	14 277 066	13 468 930	12 706 538	11 987 300	11 308 773	10 668 654	10 064 768	9 495 064	8 957 608	8 450 573
Total			**m3/annum**	**45 501 254**	**45 568 746**	**42 989 383**	**40 556 022**	**38 260 398**	**36 094 715**	**34 051 618**	**32 124 168**	**30 305 819**	**28 590 395**	**26 972 071**	**25 445 350**	**24 005 047**	**22 646 271**	**21 364 406**	**20 155 100**

Unit reference values

All interventions				**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Awareness campaigns & Efficiency				1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 6%

Net present cost			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Sectorisation		CAPEX	Rands	100 170	94 500	89 151	84 105	79 344	74 853	70 616	66 619	62 848	59 290	55 934	52 768	49 781	46 964	10 637 624	231 253
		OPEX	Rands	125 212	118 125	111 439	105 131	99 180	93 566	88 270	83 273	78 560	74 113	69 918	65 960	62 227	58 704	13 297 031	289 066
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21 061 819	457 866
		OPEX	Rands	311 161	293 548	276 932	261 257	246 469	232 518	219 356	206 940	195 226	184 176	173 751	163 916	154 638	145 885	33 044 029	718 348
Mains replacement		CAPEX	Rands	1 189 375	1 122 052	1 058 540	998 623	942 097	888 771	838 463	791 003	746 229	703 990	664 141	626 548	591 083	557 626	126 306 739	2 745 799
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 378 751	2 244 105	2 117 080	1 997 245	1 884 194	1 777 541	1 676 926	1 582 005	1 492 458	1 407 979	1 328 282	1 253 096	1 182 166	1 115 251	252 613 478	5 491 597
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34 037 738	739 951
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	563 456	531 562	501 473	473 088	446 310	421 047	397 214	374 730	353 519	333 508	314 631	296 821	280 020	264 170	59 836 637	1 300 796
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	15 025 481	14 174 982	13 372 624	12 615 683	11 901 588	11 227 913	10 592 371	9 992 803	9 427 172	8 893 559	8 390 150	7 915 236	7 467 204	7 044 532	1 294 451 998	28 140 261
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	450 764	425 249	401 179	378 471	357 048	336 837	317 771	299 784	282 815	266 807	251 704	237 457	224 016	211 336	47 869 310	1 040 637
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21 061 819	457 866
		OPEX	Rands	99 422	93 794	88 485	83 477	78 752	74 294	70 089	66 121	62 379	58 848	55 517	52 374	49 410	46 613	10 558 206	229 526
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34 037 738	739 951
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	385 761 028	8 386 109
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**1 853 001**	**1 748 114**	**1 649 164**	**1 555 815**	**1 467 750**	**1 384 670**	**1 306 293**	**1 232 351**	**1 162 596**	**1 096 788**	**1 034 706**	**976 138**	**920 885**	**868 759**	**692 741 143**	**15 059 590**
		OPEX		**18 390 792**	**17 349 804**	**16 367 739**	**15 441 263**	**14 567 230**	**13 742 669**	**12 964 782**	**12 230 927**	**11 538 610**	**10 885 481**	**10 269 322**	**9 688 040**	**9 139 660**	**8 622 321**	**1 651 834 051**	**35 909 436**
		TOTAL		**20 243 793**	**19 097 918**	**18 016 903**	**16 997 079**	**16 034 980**	**15 127 339**	**14 271 075**	**13 463 278**	**12 701 206**	**11 982 270**	**11 304 028**	**10 664 177**	**10 060 545**	**9 491 080**	**2 344 575 194**	**50 969 026**
		REDUCED PAYMENT		**32 644 469**	**30 796 669**	**29 053 461**	**27 408 925**	**25 857 477**	**24 393 846**	**23 013 062**	**21 710 436**	**20 481 544**	**19 322 211**	**18 228 501**	**17 196 699**	**16 223 301**	**15 305 001**	**2 139 153 527**	**46 503 338**
		ADDITIONAL INCOME		**11 341 394**	**10 699 428**	**10 093 800**	**9 522 453**	**8 983 446**	**8 474 949**	**7 995 235**	**7 542 675**	**7 115 731**	**6 712 954**	**6 332 975**	**5 974 505**	**5 636 325**	**5 317 288**	**1 000 721 449**	**21 754 814**

6%

Net present saving			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Pressure management			m3/annum	760 154	717 127	676 535	638 240	602 113	568 032	535 879	505 546	476 930	449 934	424 466	400 440	377 773	356 390	**67 073 121**	**1 458 111**
Mains replacement			m3/annum	347 298	327 639	309 094	291 598	275 092	259 521	244 831	230 973	217 899	205 565	193 929	182 952	172 596	162 827	**32 645 702**	**709 689**
Active and passive leakage control			m3/annum	426 272	402 144	379 381	357 906	337 647	318 535	300 505	283 495	267 448	252 310	238 028	224 555	211 844	199 853	**40 069 245**	**871 071**
Retrofitting & removal of wasteful devices			m3/annum	751 274	708 749	668 631	630 784	595 079	561 396	529 619	499 640	471 359	444 678	419 507	395 762	373 360	352 227	**66 289 561**	**1 441 077**
Water Wise Gardening			m3/annum	624 252	588 917	555 582	524 134	494 466	466 478	440 073	415 163	391 664	369 494	348 579	328 848	310 234	292 674	**62 815 103**	**1 365 546**
Meter reading, billing & cost recovery			m3/annum	1 890 232	1 783 238	1 682 300	1 587 076	1 497 241	1 412 492	1 332 539	1 257 112	1 185 955	1 118 826	1 055 496	995 751	939 388	886 215	**166 786 908**	**3 625 802**
Water Use Efficiency			m3/annum	6 242 524	5 889 173	5 555 824	5 241 343	4 944 663	4 664 777	4 400 733	4 151 635	3 916 637	3 694 940	3 485 793	3 288 484	3 102 343	2 926 739	**333 206 141**	**7 243 612**
Other			m3/annum	7 972 239	7 520 980	7 095 264	6 693 646	6 314 760	5 957 321	5 620 114	5 301 994	5 001 881	4 718 756	4 451 657	4 199 676	3 961 959	3 737 697	**444 158 442**	**9 655 618**
Total			**m3/annum**	**19 014 246**	**17 937 968**	**16 922 611**	**15 964 727**	**15 061 063**	**14 208 550**	**13 404 293**	**12 645 559**	**11 929 773**	**11 254 503**	**10 617 455**	**10 016 467**	**9 449 498**	**8 914 620**	**1 213 044 225**	**26 370 527**

Unit reference values

All interventions				**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.9**	**1.9**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.8	0.8
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.9	3.9
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	6.3	6.3
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	6.1
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6
Management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.5
Awareness campaigns & Efficiency				1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.3	2.3

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

			Discount rate :	8%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Sectorisation		CAPEX	Rands		646 435	598 551	554 214	513 161	475 149	439 953	407 364	377 189	349 249	323 378	299 424	277 245	256 708	237 693	220 086	203 783
		OPEX	Rands		808 044	748 189	692 767	641 451	593 936	549 941	509 205	471 486	436 561	404 223	374 281	346 556	320 885	297 116	275 107	254 729
Pressure management		CAPEX	Rands		0	4 629 630	4 286 694	3 969 161	3 675 149	3 402 916	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		2 008 044	1 859 300	1 721 574	1 594 050	1 475 972	1 366 641	1 265 408	1 171 674	1 084 883	1 004 522	930 113	861 215	797 422	738 353	683 661	633 019
Mains replacement		CAPEX	Rands		7 675 500	7 106 944	6 580 504	6 093 059	5 641 722	5 223 816	4 836 867	4 478 581	4 146 834	3 839 661	3 555 242	3 291 890	3 048 047	2 822 265	2 613 209	2 419 638
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		15 351 000	14 213 889	13 161 008	12 186 119	11 283 443	10 447 633	9 673 734	8 957 161	8 293 668	7 679 322	7 110 483	6 583 781	6 096 093	5 644 531	5 226 417	4 839 275
Retrofitting & removal of wasteful devices		CAPEX	Rands		0	7 481 886	6 927 672	6 414 511	5 939 362	5 499 409	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands		3 636 196	3 366 849	3 117 452	2 886 530	2 672 713	2 474 734	2 291 421	2 121 686	1 964 524	1 819 003	1 684 262	1 559 502	1 443 984	1 337 022	1 237 983	1 146 281
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	44 891 314	41 566 031	38 487 066	35 636 172	32 996 456	61 104 547	56 578 285	52 387 301	48 506 760	44 913 666	41 586 728	38 506 230	35 653 916	33 012 886	30 567 487
Water audits / manage KPI's		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		2 908 957	2 693 479	2 493 962	2 309 224	2 138 170	1 979 787	1 833 136	1 697 349	1 571 619	1 455 203	1 347 410	1 247 602	1 155 187	1 069 617	990 387	917 025
Management meters		CAPEX	Rands		0	4 629 630	4 286 694	3 969 161	3 675 149	3 402 916	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		641 609	594 082	550 076	509 330	471 602	436 668	404 322	374 373	346 641	320 964	297 189	275 175	254 792	235 918	218 443	202 262
Consumer meters		CAPEX	Rands		0	7 481 886	6 927 672	6 414 511	5 939 362	5 499 409	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands		0	84 794 703	78 513 614	72 697 791	67 312 769	62 326 638	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**			**11 958 131**	**120 090 078**	**111 194 516**	**102 957 885**	**95 331 375**	**88 269 792**	**7 535 651**	**6 977 455**	**6 460 606**	**5 982 043**	**5 538 929**	**5 128 638**	**4 748 738**	**4 396 980**	**4 071 278**	**3 769 702**
		OPEX			**21 717 653**	**65 000 252**	**60 185 418**	**55 727 239**	**51 599 295**	**47 777 125**	**74 790 353**	**69 250 327**	**64 120 673**	**59 370 993**	**54 973 142**	**50 901 057**	**47 130 609**	**43 639 452**	**40 406 900**	**37 413 797**
		TOTAL			**33 675 784**	**185 090 329**	**171 379 934**	**158 685 124**	**146 930 671**	**136 046 917**	**82 326 004**	**76 227 781**	**70 581 279**	**65 353 036**	**60 512 070**	**56 029 695**	**51 879 347**	**48 036 433**	**44 478 178**	**41 183 498**
		REDUCED PAYMENT			**2 995 287**	**16 566 312**	**28 110 379**	**37 853 315**	**45 998 613**	**55 640 426**	**58 017 894**	**59 737 848**	**60 884 652**	**61 533 779**	**61 752 667**	**61 601 493**	**61 133 880**	**60 397 538**	**59 434 844**	**58 283 372**
		ADDITIONAL INCOME			**0**	**13 553 778**	**25 099 589**	**34 860 541**	**43 037 704**	**49 812 158**	**46 122 368**	**42 705 897**	**39 542 497**	**36 613 423**	**33 901 318**	**31 390 109**	**29 064 916**	**26 911 959**	**24 918 481**	**23 072 667**

				8%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Pressure management			m3/annum		0	908 439	1 682 294	2 336 520	2 884 592	3 338 648	3 091 341	2 862 353	2 650 327	2 454 006	2 272 228	2 103 915	1 948 069	1 803 768	1 670 155	1 546 440
Mains replacement			m3/annum		448 249	830 091	1 152 904	1 423 339	1 647 383	1 525 354	1 412 365	1 307 746	1 210 875	1 121 181	1 038 131	961 232	890 030	824 102	763 057	706 534
Active and passive leakage control			m3/annum		550 180	1 018 852	1 415 072	1 747 002	2 021 993	1 872 216	1 733 533	1 605 123	1 486 225	1 376 134	1 274 199	1 179 814	1 092 420	1 011 500	936 574	867 198
Retrofitting & removal of wasteful devices			m3/annum		0	897 826	1 662 641	2 309 224	2 850 894	3 299 646	3 055 227	2 828 914	2 619 365	2 425 338	2 245 683	2 079 336	1 925 311	1 782 696	1 650 644	1 528 374
Water Wise Gardening			m3/annum		0	994 702	1 842 040	2 558 389	3 158 505	3 655 677	3 317 189	3 008 788	2 727 875	2 472 069	2 239 193	2 027 253	1 834 425	1 659 041	1 499 574	1 354 629
Meter reading, billing & cost recovery			m3/annum		0	2 258 963	4 183 265	5 810 090	7 172 951	8 302 026	7 687 061	7 117 649	6 590 416	6 102 237	5 650 220	5 231 685	4 844 153	4 485 326	4 153 080	3 845 445
Water Use Efficiency			m3/annum		0	0	0	0	0	0	2 653 751	4 814 061	6 546 899	7 910 622	8 956 773	9 730 815	10 272 781	10 617 862	10 796 933	10 837 030
Other			m3/annum		0	872 194	1 615 175	2 243 298	2 769 504	4 855 267	6 729 643	8 299 693	9 600 217	10 662 531	11 514 789	12 182 281	12 687 705	13 051 407	13 291 610	13 424 615
Total			**m3/annum**		**998 429**	**7 781 067**	**13 553 391**	**18 427 862**	**22 505 822**	**26 848 835**	**29 680 110**	**31 844 326**	**33 432 200**	**34 524 119**	**35 191 215**	**35 496 331**	**35 494 894**	**35 235 701**	**34 761 627**	**34 110 265**
Unit reference values																				
All interventions					**33.7**	**23.8**	**12.6**	**8.6**	**6.5**	**5.1**	**2.8**	**2.4**	**2.1**	**1.9**	**1.7**	**1.6**	**1.5**	**1.4**	**1.3**	**1.2**
Pressure management						7.1	3.6	2.4	1.8	1.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement					17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC					27.9	14.0	9.3	7.0	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices						8.3	4.2	2.8	2.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening						85.2	42.6	28.4	21.3	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery						4.8	2.4	1.6	1.2	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management						21.2	10.6	7.1	5.3	2.8	0.9	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.2
Awareness campaigns & Efficiency										13.6	10.2	6.3	4.6	3.7	3.1	2.6	2.3	2.1	1.9	1.7

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

			Discount rate :	8%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost				**Unit**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Sectorisation		CAPEX		Rands	188 688	174 711	161 770	149 787	138 691	128 418	118 906	110 098	101 942	94 391	87 399	80 925	74 931	69 380	64 241	59 482
		OPEX		Rands	235 860	218 389	202 212	187 233	173 364	160 523	148 632	137 622	127 428	117 989	109 249	101 156	93 663	86 725	80 301	74 353
Pressure management		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	586 129	542 712	502 511	465 288	430 822	398 909	369 361	342 001	316 667	293 210	271 491	251 381	232 760	215 518	199 554	184 772
Mains replacement		CAPEX		Rands	2 240 405	2 074 449	1 920 786	1 778 506	1 646 765	1 524 782	1 411 835	1 307 255	1 210 421	1 120 760	1 037 741	960 871	889 696	823 792	762 771	706 269
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	4 480 811	4 148 899	3 841 573	3 557 012	3 293 530	3 049 564	2 823 671	2 614 510	2 420 843	2 241 521	2 075 482	1 921 743	1 779 392	1 647 585	1 525 541	1 412 538
Retrofitting & removal of wasteful devices		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX		Rands	1 061 371	982 751	909 955	842 551	780 139	722 351	668 844	619 300	573 426	530 950	491 620	455 204	421 485	390 264	361 355	334 588
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	28 303 228	26 206 693	24 265 456	22 468 015	20 803 718	19 262 702	17 835 835	16 514 662	15 291 354	14 158 661	13 109 871	12 138 770	11 239 601	10 407 038	9 636 147	8 922 358
Water audits / manage KPI's		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	849 097	786 201	727 964	674 040	624 112	577 881	535 075	495 440	458 741	424 760	393 296	364 163	337 188	312 211	289 084	267 671
Management meters		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	187 279	173 407	160 562	148 668	137 656	127 459	118 018	109 276	101 181	93 686	86 747	80 321	74 371	68 862	63 761	59 038
Consumer meters		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**			**3 490 465**	**3 231 912**	**2 992 511**	**2 770 843**	**2 565 596**	**2 375 552**	**2 199 585**	**2 036 653**	**1 885 789**	**1 746 101**	**1 616 760**	**1 497 000**	**1 386 111**	**1 283 437**	**1 188 367**	**1 100 340**
		OPEX			**34 642 404**	**32 076 300**	**29 700 278**	**27 500 257**	**25 463 201**	**23 577 038**	**21 830 591**	**20 213 510**	**18 716 213**	**17 329 827**	**16 046 136**	**14 857 533**	**13 756 975**	**12 737 940**	**11 794 389**	**10 920 731**
		TOTAL			**38 132 869**	**35 308 212**	**32 692 789**	**30 271 101**	**28 028 797**	**25 952 590**	**24 030 176**	**22 250 163**	**20 602 003**	**19 075 928**	**17 662 897**	**16 354 534**	**15 143 087**	**14 021 377**	**12 982 756**	**12 021 071**
		REDUCED PAYMENT			**57 728 942**	**56 936 852**	**52 719 307**	**48 814 173**	**45 198 309**	**41 850 286**	**38 750 265**	**35 879 875**	**33 222 106**	**30 761 209**	**28 482 601**	**26 372 779**	**24 419 240**	**22 610 407**	**20 935 562**	**19 384 780**
		ADDITIONAL INCOME			**21 363 581**	**19 781 093**	**18 315 827**	**16 959 099**	**15 702 870**	**14 539 694**	**13 462 680**	**12 465 444**	**11 542 078**	**10 687 109**	**9 895 471**	**9 162 474**	**8 483 772**	**7 855 344**	**7 273 467**	**6 734 692**

				8%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving				**Unit**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Pressure management				m3/annum	1 431 889	1 325 823	1 227 614	1 136 680	1 052 481	974 520	902 333	835 493	773 605	716 301	663 242	614 113	568 623	526 503	487 502	451 391
Mains replacement				m3/annum	654 198	605 739	560 870	519 324	480 855	445 236	412 256	381 718	353 443	327 262	303 020	280 574	259 791	240 547	222 729	206 231
Active and passive leakage control				m3/annum	802 961	743 483	688 410	637 417	590 200	546 482	506 002	468 520	433 815	401 681	371 926	344 376	318 867	295 247	273 377	253 127
Retrofitting & removal of wasteful devices				m3/annum	1 415 161	1 310 335	1 213 273	1 123 401	1 040 186	963 135	891 792	825 733	764 568	707 933	655 494	606 938	561 980	520 352	481 807	446 118
Water Wise Gardening				m3/annum	1 215 089	1 088 790	1 008 139	933 462	864 316	800 293	741 012	686 122	635 298	588 239	544 666	504 320	466 963	432 373	400 346	370 691
Meter reading, billing & cost recovery				m3/annum	3 560 597	3 296 849	3 052 638	2 826 517	2 617 145	2 423 282	2 243 780	2 077 574	1 923 680	1 781 185	1 649 245	1 527 079	1 413 962	1 309 224	1 212 244	1 122 449
Water Use Efficiency				m3/annum	10 935 805	10 887 898	10 081 387	9 334 618	8 643 164	8 002 930	7 410 120	6 861 223	6 352 984	5 882 392	5 446 660	5 043 203	4 669 633	4 323 734	4 003 457	3 706 905
Other				m3/annum	13 723 681	13 904 781	12 874 797	11 921 109	11 038 064	10 220 429	9 463 360	8 762 371	8 113 306	7 512 321	6 955 852	6 440 604	5 963 522	5 521 780	5 112 759	4 734 036
Total				**m3/annum**	**33 739 382**	**33 163 697**	**30 707 127**	**28 432 525**	**26 326 412**	**24 376 308**	**22 570 655**	**20 898 755**	**19 350 699**	**17 917 314**	**16 590 105**	**15 361 209**	**14 223 341**	**13 169 761**	**12 194 223**	**11 290 947**
Unit reference values																				
All interventions					**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**
Pressure management					0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement					3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC					5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management					0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Awareness campaigns & Efficiency					1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 8%

Net present cost			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
				32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Sectorisation		CAPEX	Rands	55 076	50 997	47 219	43 721	40 483	37 484	34 707	32 136	29 756	27 552	25 511	23 621	21 872	20 251	8 473 728	184 211
		OPEX	Rands	68 845	63 746	59 024	54 652	50 603	46 855	43 384	40 171	37 195	34 440	31 889	29 527	27 339	25 314	10 592 161	230 264
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19 963 550	433 990
		OPEX	Rands	171 085	158 412	146 678	135 813	125 753	116 438	107 813	99 827	92 432	85 585	79 246	73 376	67 940	62 908	26 322 242	572 223
Mains replacement		CAPEX	Rands	653 953	605 512	560 659	519 129	480 675	445 069	412 101	381 575	353 310	327 139	302 907	280 469	259 694	240 457	100 613 536	2 187 251
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 307 906	1 211 024	1 121 318	1 038 258	961 350	890 139	824 203	763 151	706 621	654 279	605 813	560 938	519 387	480 914	201 227 071	4 374 502
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32 262 840	701 366
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	309 804	286 856	265 607	245 932	227 715	210 847	195 229	180 768	167 378	154 979	143 499	132 870	123 027	113 914	47 664 722	1 036 190
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	8 261 443	7 649 484	7 082 855	6 558 199	6 072 407	5 622 599	5 206 110	4 820 472	4 463 400	4 132 778	3 826 646	3 543 191	3 280 733	3 037 715	980 516 986	21 315 587
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	247 843	229 485	212 486	196 746	182 172	168 678	156 183	144 614	133 902	123 983	114 799	106 296	98 422	91 131	38 131 778	828 952
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19 963 550	433 990
		OPEX	Rands	54 665	50 616	46 867	43 395	40 180	37 204	34 448	31 897	29 534	27 346	25 321	23 445	21 708	20 100	8 410 465	182 836
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32 262 840	701 366
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	365 645 516	7 948 816
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**1 018 833**	**943 364**	**873 485**	**808 783**	**748 873**	**693 401**	**642 038**	**594 479**	**550 444**	**509 670**	**471 917**	**436 960**	**404 593**	**374 623**	**626 850 282**	**13 627 180**
		OPEX		**10 111 788**	**9 362 766**	**8 669 228**	**8 027 063**	**7 432 466**	**6 881 913**	**6 372 141**	**5 900 131**	**5 463 084**	**5 058 411**	**4 683 714**	**4 336 772**	**4 015 530**	**3 718 083**	**1 265 200 703**	**27 504 363**
		TOTAL		**11 130 621**	**10 306 130**	**9 542 713**	**8 835 846**	**8 181 339**	**7 575 314**	**7 014 179**	**6 494 610**	**6 013 528**	**5 568 082**	**5 155 631**	**4 773 733**	**4 420 123**	**4 092 706**	**1 892 050 985**	**41 131 543**
		REDUCED PAYMENT		**17 948 870**	**16 619 324**	**15 388 263**	**14 248 392**	**13 192 955**	**12 215 699**	**11 310 833**	**10 472 993**	**9 697 216**	**8 978 904**	**8 313 800**	**7 697 963**	**7 127 743**	**6 599 762**	**1 533 821 710**	**33 343 950**
		ADDITIONAL INCOME		**6 235 826**	**5 773 913**	**5 346 215**	**4 950 199**	**4 583 518**	**4 243 998**	**3 929 628**	**3 638 544**	**3 369 023**	**3 119 465**	**2 888 394**	**2 674 439**	**2 476 332**	**2 292 900**	**760 354 492**	**16 529 445**

Net present saving			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
				32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Pressure management			m3/annum	417 955	386 995	358 329	331 786	307 209	284 453	263 382	243 873	225 808	209 081	193 594	179 254	165 976	153 681	**50 962 582**	**1 107 882**
Mains replacement			m3/annum	190 954	176 810	163 713	151 586	140 357	129 960	120 334	111 420	103 167	95 525	88 449	81 897	75 831	70 213	**25 216 581**	**548 187**
Active and passive leakage control			m3/annum	234 377	217 015	200 940	186 056	172 274	159 513	147 697	136 757	126 626	117 247	108 562	100 520	93 074	86 180	**30 950 763**	**672 843**
Retrofitting & removal of wasteful devices			m3/annum	413 072	382 474	354 143	327 910	303 620	281 130	260 306	241 024	223 170	206 639	191 332	177 160	164 037	151 886	**50 367 228**	**1 094 940**
Water Wise Gardening			m3/annum	343 232	317 807	294 266	272 469	252 286	233 598	216 294	200 273	185 438	171 701	158 983	147 206	136 302	126 206	**48 685 530**	**1 058 381**
Meter reading, billing & cost recovery			m3/annum	1 039 304	962 319	891 036	825 033	763 920	707 333	654 938	606 424	561 504	519 911	481 399	445 740	412 722	382 150	**126 725 749**	**2 754 908**
Water Use Efficiency			m3/annum	3 432 319	3 178 074	2 942 661	2 724 686	2 522 857	2 335 979	2 162 943	2 002 725	1 854 375	1 717 014	1 589 828	1 472 063	1 363 021	1 262 057	**225 284 242**	**4 897 484**
Other			m3/annum	4 383 367	4 058 673	3 758 031	3 479 658	3 221 906	2 983 246	2 762 265	2 557 652	2 368 197	2 192 775	2 030 347	1 879 951	1 740 695	1 611 755	**305 091 219**	**6 632 418**
Total			**m3/annum**	**10 454 581**	**9 680 167**	**8 963 118**	**8 299 183**	**7 684 429**	**7 115 212**	**6 588 159**	**6 100 147**	**5 648 285**	**5 229 893**	**4 842 494**	**4 483 790**	**4 151 658**	**3 844 128**	**863 283 894**	**18 767 041**
Unit reference values																			
All interventions				**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**2.2**	**2.2**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.9	0.9
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.0	4.0
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	6.5	6.5
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	7.5
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6
Management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.6
Awareness campaigns & Efficiency				1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.6	2.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

			Discount rate :	10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Sectorisation		CAPEX	Rands		646 435	587 668	534 244	485 676	441 524	401 385	364 896	331 723	301 567	274 152	249 229	226 571	205 974	187 249	170 227	154 751
		OPEX	Rands		808 044	734 585	667 805	607 095	551 905	501 732	456 120	414 654	376 958	342 689	311 536	283 214	257 468	234 061	212 783	193 439
Pressure management		CAPEX	Rands		0	4 545 455	4 132 231	3 756 574	3 415 067	3 104 607	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		2 008 044	1 825 494	1 659 540	1 508 673	1 371 521	1 246 837	1 133 488	1 030 444	936 767	851 607	774 188	703 807	639 825	581 659	528 781	480 710
Mains replacement		CAPEX	Rands		7 675 500	6 977 727	6 343 388	5 766 717	5 242 470	4 765 882	4 332 620	3 938 745	3 580 677	3 255 161	2 959 238	2 690 216	2 445 651	2 223 319	2 021 199	1 837 454
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		15 351 000	13 955 455	12 686 777	11 533 434	10 484 940	9 531 763	8 665 239	7 877 490	7 161 355	6 510 323	5 918 475	5 380 432	4 891 302	4 446 638	4 042 398	3 674 907
Retrofitting & removal of wasteful devices		CAPEX	Rands		0	7 345 851	6 678 047	6 070 951	5 519 047	5 017 315	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands		3 636 196	3 305 633	3 005 121	2 731 928	2 483 571	2 257 792	2 052 538	1 865 944	1 696 312	1 542 102	1 401 911	1 274 465	1 158 604	1 053 277	957 524	870 477
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	44 075 108	40 068 280	36 425 709	33 114 281	30 103 892	54 734 349	49 758 499	45 234 999	41 122 726	37 384 296	33 985 724	30 896 113	28 087 375	25 533 978	23 212 707
Water audits / manage KPI's		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		2 908 957	2 644 506	2 404 097	2 185 543	1 986 857	1 806 234	1 642 030	1 492 755	1 357 050	1 233 682	1 121 529	1 019 572	926 883	842 621	766 019	696 381
Management meters		CAPEX	Rands		0	4 545 455	4 132 231	3 756 574	3 415 067	3 104 607	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		641 609	583 281	530 255	482 050	438 227	398 389	362 171	329 247	299 315	272 105	247 368	224 880	204 436	185 851	168 956	153 596
Consumer meters		CAPEX	Rands		0	7 345 851	6 678 047	6 070 951	5 519 047	5 017 315	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands		0	83 252 981	75 684 529	68 804 117	62 549 197	56 862 906	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**			**11 958 131**	**117 906 622**	**107 187 838**	**97 443 489**	**88 584 990**	**80 531 809**	**6 750 053**	**6 136 412**	**5 578 557**	**5 071 415**	**4 610 377**	**4 191 252**	**3 810 229**	**3 463 845**	**3 148 950**	**2 862 682**
		OPEX			**21 717 653**	**63 818 429**	**58 016 753**	**52 742 503**	**47 947 730**	**43 588 846**	**66 993 398**	**60 903 089**	**55 366 444**	**50 333 131**	**45 757 392**	**41 597 629**	**37 816 026**	**34 378 206**	**31 252 914**	**28 411 740**
		TOTAL			**33 675 784**	**181 725 050**	**165 204 591**	**150 185 992**	**136 532 720**	**124 120 655**	**73 743 451**	**67 039 501**	**60 945 001**	**55 404 546**	**50 367 769**	**45 788 881**	**41 626 256**	**37 842 050**	**34 401 864**	**31 274 422**
		REDUCED PAYMENT			**2 995 287**	**16 265 106**	**27 097 476**	**35 825 902**	**42 743 395**	**50 762 826**	**51 969 482**	**52 537 217**	**52 572 229**	**52 166 682**	**51 400 391**	**50 342 295**	**49 051 784**	**47 579 859**	**45 970 170**	**44 259 930**
		ADDITIONAL INCOME			**0**	**13 307 346**	**24 195 174**	**32 993 419**	**39 992 024**	**45 445 481**	**41 314 074**	**37 558 249**	**34 143 863**	**31 039 875**	**28 218 068**	**25 652 789**	**23 320 718**	**21 200 652**	**19 273 320**	**17 521 200**

				10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Pressure management			m3/annum		0	891 922	1 621 676	2 211 376	2 680 456	3 045 973	2 769 066	2 517 333	2 288 484	2 080 440	1 891 309	1 719 372	1 563 066	1 420 969	1 291 790	1 174 354
Mains replacement			m3/annum		448 249	814 999	1 111 362	1 347 105	1 530 801	1 391 637	1 265 125	1 150 114	1 045 558	950 507	864 097	785 543	714 130	649 209	590 190	536 536
Active and passive leakage control			m3/annum		550 180	1 000 327	1 364 082	1 653 433	1 878 901	1 708 092	1 552 811	1 411 646	1 283 315	1 166 650	1 060 591	964 173	876 521	796 838	724 398	658 543
Retrofitting & removal of wasteful devices			m3/annum		0	881 502	1 602 731	2 185 543	2 649 142	3 010 389	2 736 717	2 487 925	2 261 750	2 056 136	1 869 215	1 699 286	1 544 806	1 404 369	1 276 699	1 160 635
Water Wise Gardening			m3/annum		0	976 616	1 775 666	2 421 363	2 934 985	3 335 210	2 971 369	2 646 117	2 355 445	2 095 754	1 863 813	1 656 722	1 471 882	1 306 956	1 159 853	1 028 694
Meter reading, billing & cost recovery			m3/annum		0	2 217 891	4 032 529	5 498 903	6 665 337	7 574 247	6 885 679	6 259 708	5 690 644	5 173 313	4 703 011	4 275 465	3 886 786	3 533 442	3 212 220	2 920 200
Water Use Efficiency			m3/annum		0	0	0	0	0	0	2 377 095	4 233 787	5 653 068	6 706 412	7 455 251	7 952 268	8 242 536	8 364 519	8 350 940	8 229 554
Other			m3/annum		0	856 336	1 556 975	2 123 148	2 573 513	4 429 641	6 028 072	7 299 271	8 289 524	9 039 407	9 584 438	9 955 668	10 180 190	10 281 613	10 280 461	10 194 546
Total			**m3/annum**		**998 429**	**7 639 593**	**13 065 021**	**17 440 871**	**20 913 136**	**24 495 189**	**26 585 935**	**28 005 901**	**28 867 788**	**29 268 619**	**29 291 726**	**29 008 498**	**28 479 917**	**27 757 914**	**26 886 550**	**25 903 064**
Unit reference values																				
All interventions					**33.7**	**23.8**	**12.6**	**8.6**	**6.5**	**5.1**	**2.8**	**2.4**	**2.1**	**1.9**	**1.7**	**1.6**	**1.5**	**1.4**	**1.3**	**1.2**
Pressure management						7.1	3.6	2.4	1.8	1.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement					17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC					27.9	14.0	9.3	7.0	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices						8.3	4.2	2.8	2.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening						85.2	42.6	28.4	21.3	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery						4.8	2.4	1.6	1.2	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management						21.2	10.6	7.1	5.3	2.8	0.9	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.2
Awareness campaigns & Efficiency										13.6	10.2	6.3	4.6	3.7	3.1	2.6	2.3	2.1	1.9	1.7

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

			Discount rate :	10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost				**Unit**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Sectorisation		CAPEX		Rands	140 683	127 894	116 267	105 697	96 088	87 353	79 412	72 193	65 630	59 663	54 239	49 309	44 826	40 751	37 046	33 678
		OPEX		Rands	175 854	159 867	145 334	132 122	120 111	109 191	99 265	90 241	82 037	74 579	67 799	61 636	56 032	50 939	46 308	42 098
Pressure management		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	437 009	397 281	361 164	328 331	298 483	271 348	246 680	224 255	203 868	185 334	168 486	153 169	139 244	126 586	115 078	104 616
Mains replacement		CAPEX		Rands	1 670 412	1 518 557	1 380 506	1 255 006	1 140 914	1 037 195	942 904	857 186	779 260	708 418	644 016	585 469	532 245	483 859	439 872	399 883
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	3 340 825	3 037 114	2 761 012	2 510 011	2 281 828	2 074 389	1 885 809	1 714 371	1 558 519	1 416 836	1 288 033	1 170 939	1 064 490	967 718	879 744	799 767
Retrofitting & removal of wasteful devices		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX		Rands	791 342	719 402	654 002	594 547	540 497	491 361	446 692	406 084	369 167	335 606	305 097	277 361	252 146	229 224	208 385	189 441
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	21 102 461	19 184 055	17 440 050	15 854 591	14 413 265	13 102 968	11 911 789	10 828 899	9 844 454	8 949 503	8 135 912	7 396 284	6 723 894	6 112 631	5 556 937	5 051 761
Water audits / manage KPI's		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	633 074	575 522	523 202	475 638	432 398	393 089	357 354	324 867	295 334	268 485	244 077	221 889	201 717	183 379	166 708	151 553
Management meters		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	139 633	126 939	115 399	104 908	95 371	86 701	78 819	71 654	65 140	59 218	53 834	48 940	44 491	40 447	36 770	33 427
Consumer meters		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**			**2 602 438**	**2 365 853**	**2 150 775**	**1 955 250**	**1 777 500**	**1 615 909**	**1 469 008**	**1 335 462**	**1 214 056**	**1 103 688**	**1 003 352**	**912 139**	**829 217**	**753 834**	**685 303**	**623 003**
		OPEX			**25 828 855**	**23 480 777**	**21 346 161**	**19 405 601**	**17 641 455**	**16 037 687**	**14 579 715**	**13 254 287**	**12 049 351**	**10 953 956**	**9 958 142**	**9 052 856**	**8 229 869**	**7 481 699**	**6 801 545**	**6 183 222**
		TOTAL			**28 431 293**	**25 846 630**	**23 496 936**	**21 360 851**	**19 418 955**	**17 653 596**	**16 048 723**	**14 589 749**	**13 263 408**	**12 057 643**	**10 961 494**	**9 964 995**	**9 059 086**	**8 235 533**	**7 486 848**	**6 806 225**
		REDUCED PAYMENT			**43 041 830**	**41 679 418**	**37 890 380**	**34 445 800**	**31 314 364**	**28 467 603**	**25 879 639**	**23 526 945**	**21 388 132**	**19 443 756**	**17 676 142**	**16 069 220**	**14 608 382**	**13 280 347**	**12 073 043**	**10 975 493**
		ADDITIONAL INCOME			**15 928 364**	**14 480 331**	**13 163 937**	**11 967 216**	**10 879 287**	**9 890 261**	**8 991 146**	**8 173 769**	**7 430 699**	**6 755 181**	**6 141 074**	**5 582 794**	**5 075 268**	**4 613 880**	**4 194 436**	**3 813 124**

				10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving				**Unit**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Pressure management				m3/annum	1 067 595	970 541	882 310	802 100	729 182	662 892	602 629	547 845	498 041	452 764	411 604	374 185	340 169	309 244	281 131	255 574
Mains replacement				m3/annum	487 760	443 419	403 108	366 462	333 147	302 861	275 328	250 298	227 544	206 858	188 053	170 957	155 416	141 287	128 443	116 766
Active and passive leakage control				m3/annum	598 676	544 251	494 773	449 794	408 904	371 731	337 937	307 215	279 287	253 897	230 815	209 832	190 757	173 415	157 650	143 318
Retrofitting & removal of wasteful devices				m3/annum	1 055 123	959 203	872 003	792 730	720 663	655 148	595 589	541 445	492 223	447 475	406 796	369 814	336 195	305 632	277 847	252 588
Water Wise Gardening				m3/annum	905 952	797 026	724 569	658 699	598 817	544 379	494 890	449 900	409 000	371 818	338 017	307 288	279 353	253 957	230 870	209 882
Meter reading, billing & cost recovery				m3/annum	2 654 727	2 413 388	2 193 990	1 994 536	1 813 214	1 648 377	1 498 524	1 362 295	1 238 450	1 125 864	1 023 512	930 466	845 878	768 980	699 073	635 521
Water Use Efficiency				m3/annum	8 153 571	7 970 255	7 245 687	6 586 988	5 988 171	5 443 792	4 948 901	4 499 001	4 090 001	3 718 183	3 380 166	3 072 878	2 793 526	2 539 569	2 308 699	2 098 817
Other				m3/annum	10 232 170	10 178 701	9 253 364	8 412 150	7 647 409	6 952 190	6 320 172	5 745 611	5 223 283	4 748 439	4 316 763	3 924 330	3 567 573	3 243 248	2 948 407	2 680 370
Total				**m3/annum**	**25 155 575**	**24 276 783**	**22 069 803**	**20 063 457**	**18 239 506**	**16 581 370**	**15 073 972**	**13 703 611**	**12 457 828**	**11 325 299**	**10 295 726**	**9 359 751**	**8 508 864**	**7 735 331**	**7 032 119**	**6 392 836**
Unit reference values																				
All interventions					**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**
Pressure management					0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement					3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC					5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management					0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Awareness campaigns & Efficiency					1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

KZN METRO WC/WDM POTENTIAL ASSESSMENT

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 10%

Net present cost			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Sectorisation		CAPEX	Rands	30 617	27 833	25 303	23 003	20 912	19 011	17 282	15 711	14 283	12 984	11 804	10 731	9 755	8 869	7 022 098	152 654
		OPEX	Rands	38 271	34 792	31 629	28 754	26 140	23 763	21 603	19 639	17 854	16 231	14 755	13 414	12 194	11 086	8 777 623	190 818
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18 953 934	412 042
		OPEX	Rands	95 106	86 460	78 600	71 454	64 959	59 053	53 685	48 804	44 368	40 334	36 667	33 334	30 304	27 549	21 812 992	474 195
Mains replacement		CAPEX	Rands	363 530	330 482	300 438	273 126	248 296	225 724	205 203	186 549	169 590	154 172	140 157	127 415	115 832	105 302	83 377 482	1 812 554
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	727 061	660 964	600 877	546 252	496 592	451 448	410 407	373 097	339 179	308 345	280 313	254 830	231 664	210 604	166 754 964	3 625 108
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30 631 212	665 896
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	172 219	156 563	142 330	129 391	117 628	106 935	97 213	88 376	80 341	73 038	66 398	60 362	54 874	49 886	39 499 303	858 680
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	4 592 510	4 175 009	3 795 463	3 450 421	3 136 746	2 851 588	2 592 352	2 356 684	2 142 440	1 947 673	1 770 612	1 609 647	1 463 315	1 330 287	772 562 236	16 794 831
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	137 775	125 250	113 864	103 513	94 102	85 548	77 771	70 701	64 273	58 430	53 118	48 289	43 899	39 909	31 599 442	686 944
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18 953 934	412 042
		OPEX	Rands	30 388	27 626	25 114	22 831	20 756	18 869	17 153	15 594	14 176	12 888	11 716	10 651	9 683	8 802	6 969 672	151 515
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30 631 212	665 896
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	347 153 730	7 546 820
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**566 366**	**514 878**	**468 071**	**425 519**	**386 836**	**351 669**	**319 699**	**290 635**	**264 214**	**240 195**	**218 359**	**198 508**	**180 462**	**164 056**	**576 222 904**	**12 526 585**
		OPEX		**5 621 111**	**5 110 101**	**4 645 547**	**4 223 224**	**3 839 295**	**3 490 268**	**3 172 971**	**2 884 519**	**2 622 290**	**2 383 900**	**2 167 182**	**1 970 165**	**1 791 059**	**1 628 236**	**1 008 476 930**	**21 923 412**
		TOTAL		**6 187 478**	**5 624 980**	**5 113 618**	**4 648 744**	**4 226 130**	**3 841 937**	**3 492 670**	**3 175 154**	**2 886 504**	**2 624 095**	**2 385 540**	**2 168 673**	**1 971 521**	**1 792 292**	**1 584 699 834**	**34 449 996**
		REDUCED PAYMENT		**9 977 721**	**9 070 656**	**8 246 051**	**7 496 410**	**6 814 918**	**6 195 380**	**5 632 164**	**5 120 149**	**4 654 681**	**4 231 528**	**3 846 843**	**3 497 130**	**3 179 209**	**2 890 190**	**1 146 153 554**	**24 916 382**
		ADDITIONAL INCOME		**3 466 476**	**3 151 342**	**2 864 856**	**2 604 415**	**2 367 650**	**2 152 409**	**1 956 735**	**1 778 850**	**1 617 137**	**1 470 124**	**1 336 477**	**1 214 979**	**1 104 526**	**1 004 115**	**600 347 111**	**13 051 024**

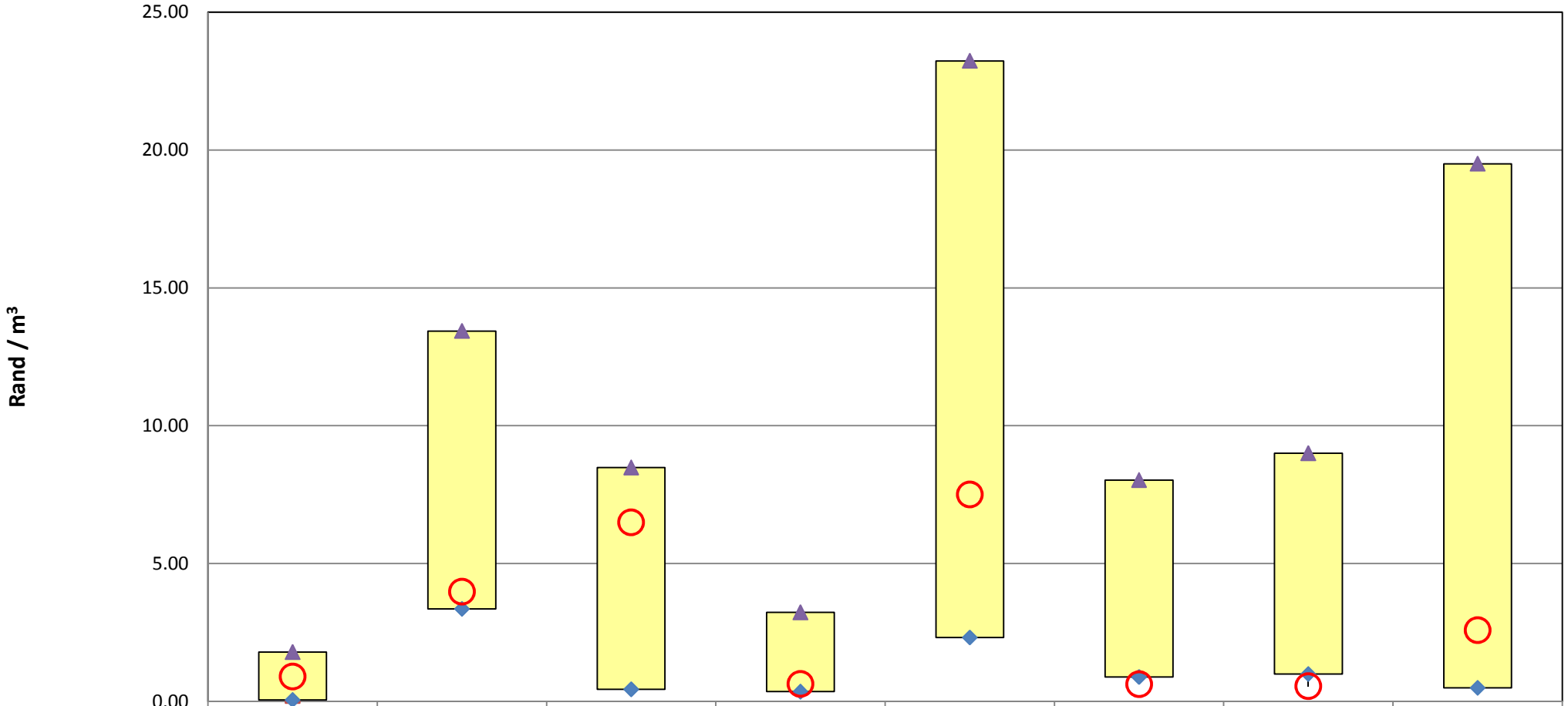
10%

Net present saving			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Pressure management			m3/annum	232 340	211 218	192 016	174 560	158 691	144 265	131 150	119 227	108 388	98 535	89 577	81 434	74 031	67 301	**40 238 125**	**874 742**
Mains replacement			m3/annum	106 151	96 501	87 728	79 753	72 502	65 911	59 919	54 472	49 520	45 018	40 926	37 205	33 823	30 748	**20 253 046**	**440 284**
Active and passive leakage control			m3/annum	130 289	118 445	107 677	97 888	88 989	80 899	73 545	66 859	60 781	55 255	50 232	45 666	41 514	37 740	**24 858 533**	**540 403**
Retrofitting & removal of wasteful devices			m3/annum	229 626	208 750	189 773	172 521	156 837	142 579	129 618	117 834	107 122	97 384	88 531	80 482	73 166	66 514	**39 768 056**	**864 523**
Water Wise Gardening			m3/annum	190 802	173 456	157 687	143 352	130 320	118 473	107 703	97 911	89 010	80 918	73 562	66 875	60 795	55 268	**39 120 993**	**850 456**
Meter reading, billing & cost recovery			m3/annum	577 746	525 224	477 476	434 069	394 608	358 735	326 123	296 475	269 523	245 021	222 746	202 496	184 088	167 352	**100 057 852**	**2 175 171**
Water Use Efficiency			m3/annum	1 908 016	1 734 560	1 576 873	1 433 520	1 303 200	1 184 728	1 077 025	979 114	890 103	809 185	735 623	668 748	607 953	552 684	**157 864 970**	**3 431 847**
Other			m3/annum	2 436 700	2 215 182	2 013 802	1 830 729	1 664 299	1 512 999	1 375 454	1 250 412	1 136 739	1 033 399	939 453	854 049	776 408	705 825	**217 812 431**	**4 735 053**
Total			**m3/annum**	**5 811 669**	**5 283 335**	**4 803 032**	**4 366 393**	**3 969 448**	**3 608 589**	**3 280 536**	**2 982 305**	**2 711 186**	**2 464 715**	**2 240 650**	**2 036 954**	**1 851 777**	**1 683 433**	**639 974 007**	**13 912 478**

Unit reference values

All interventions				**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**2.5**	**2.5**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.0	1.0
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.1	4.1
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	6.7	6.7
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	8.9
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.7
Management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.7
Awareness campaigns & Efficiency				1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.9	2.9

KZN METRO WC/WDM POTENTIAL ASSESSMENT
eThekwini Metro Unit Reference Values - Scenario 2



	Pressure management	Mains replacement	Leak detection & repair	Retrofitting	Water Wise	Metering and billing	Management	Awareness campaigns
Ideal conditions	0.06	3.36	0.44	0.36	2.32	0.89	1.00	0.50
Expected conditions	0.21	5.60	2.23	1.20	7.74	4.46	3.33	1.67
eThekwini	0.91	3.99	6.50	0.64	7.51	0.63	0.56	2.60
Poor conditions	1.79	13.43	8.49	3.23	23.23	8.03	9.00	19.50

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipali	eThekwini		Unit	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**
Billed consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567
Unbilled potential paid consumption	% of system input volume	4.0%	m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Total potential revenue water		75%	**m3/annum**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**
Non-revenue water			**m3/annum**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**
Unbilled consumption	% of system input volume	1.0%	m3/annum	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600
Apparent losses		20.0%	m3/annum	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417
Unavoidable annual real losses		2.0	m3/annum	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Potential saving (Real losses)			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**
% return flow			m3/annum	0%	50%	55%	60%	65%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Return flow			m3/annum	0	138 854 331	152 739 764	166 625 197	180 510 631	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064
Target Sysem Input Volume			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**
% Reduction			**%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	20%	m3/annum	0	490 557	981 114	1 471 671	1 962 228	2 452 785	2 943 342	3 433 899	3 924 456	4 415 013	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570
Mains replacement	Replace _% per annum, Saving 200l/km/h	5%	m3/annum	224 125	448 249	672 374	896 498	1 120 623	1 344 748	1 568 872	1 792 997	2 017 121	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	275 090	550 180	825 270	1 100 360	1 375 450	1 650 540	1 925 629	2 200 719	2 475 809	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	10	m3/annum	0	484 826	969 652	1 454 479	1 939 305	2 424 131	2 908 957	3 393 783	3 878 609	4 363 436	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262
Water Wise Gardening	Reduce billed consumption by _% for 1/3	7.5%	m3/annum	0	537 139	1 074 278	1 611 417	2 148 556	2 685 695	3 222 834	3 759 972	4 297 111	4 834 250	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389
Total direct interventions			**m3/annum**	**499 215**	**2 510 951**	**4 522 688**	**6 534 424**	**8 546 161**	**10 557 897**	**12 569 634**	**14 581 371**	**16 593 107**	**18 604 844**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**
Indirect measureable interventions																			
Sectorisation																			
Legislation																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	0.0%	0.2%	0.5%	0.7%	0.9%	1.2%	1.4%	1.6%	1.9%	2.1%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
Other interventions			**m3/annum**	**0**	**713 398**	**1 426 796**	**2 140 194**	**2 853 592**	**3 566 990**	**4 280 388**	**4 993 787**	**5 707 185**	**6 420 583**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**
Total estimated savings			**m3/annum**	**499 215**	**3 224 349**	**5 949 484**	**8 674 618**	**11 399 753**	**14 124 888**	**16 850 022**	**19 575 157**	**22 300 292**	**25 025 426**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**
System Input Volume with WCWDM			**m3/annum**	**304 460 794**	**301 735 660**	**299 010 525**	**296 285 391**	**293 560 256**	**290 835 121**	**288 109 987**	**285 384 852**	**282 659 717**	**279 934 583**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**
% Reduction			**%**	**0%**	**1%**	**2%**	**3%**	**4%**	**5%**	**6%**	**6%**	**7%**	**8%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
Meter reading, billing & cost recovery			m3/annum	0	1 219 840	2 439 680	3 659 520	4 879 360	6 099 200	7 319 040	8 538 880	9 758 720	10 978 560	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	404 022	404 022	404 022	404 022	404 022
		OPEX	Rands	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044
Pressure management		CAPEX	Rands		2 000 000	2 000 000	2 000 000	2 000 000	2 000 000	2 000 000	2 000 000	2 000 000	2 000 000	2 000 000					
		OPEX	Rands	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500
		OPEX	Rands	0															
Active and passive leakage control		CAPEX	Rands	0															
	R 1500 / km	OPEX	Rands	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands		4 040 218	4 040 218	4 040 218	4 040 218	4 040 218	4 040 218	4 040 218	4 040 218	4 040 218	4 040 218					
		OPEX	Rands	0															
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0															
	R 5 / consumer / month	OPEX	Rands	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619
Water audits / manage KPI's		CAPEX	Rands	0															
	R 1500 / zone / month	OPEX	Rands	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands		2 500 000	2 500 000	2 500 000	2 500 000	2 500 000	2 500 000	2 500 000	2 500 000	2 500 000	2 500 000					
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands		4 040 218	4 040 218	4 040 218	4 040 218	4 040 218	4 040 218	4 040 218	4 040 218	4 040 218	4 040 218					
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening	R 2000 per customer	CAPEX	Rands		45 789 140	45 789 140	45 789 140	45 789 140	45 789 140	45 789 140	45 789 140	45 789 140	45 789 140	45 789 140					
		OPEX	Rands	0															
TOTAL COSTS		**CAPEX**	Rands	**12 119 740**	**70 489 316**	**70 489 316**	**70 489 316**	**70 489 316**	**70 489 316**	**70 489 316**	**70 489 316**	**70 489 316**	**70 489 316**	**70 489 316**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**
		OPEX	Rands	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**
		TOTAL	Rands	**82 320 012**	**140 689 588**	**140 689 588**	**140 689 588**	**140 689 588**	**140 689 588**	**140 689 588**	**140 689 588**	**140 689 588**	**140 689 588**	**140 689 588**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**
		REDUCED PAYMENT		**1 497 644**	**9 673 048**	**17 848 451**	**26 023 855**	**34 199 259**	**42 374 663**	**50 550 067**	**58 725 471**	**66 900 875**	**75 076 279**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**
		ADDITIONAL INCOME		**0**	**7 319 040**	**14 638 080**	**21 957 121**	**29 276 161**	**36 595 201**	**43 914 241**	**51 233 282**	**58 552 322**	**65 871 362**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipali	eThekwini		Unit	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**
Billed consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567
Unbilled potential paid consumption	% of system input volume	4.0%	m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Total potential revenue water		75%	**m3/annum**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**
Non-revenue water			**m3/annum**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**
Unbilled consumption	% of system input volume	1.0%	m3/annum	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600
Apparent losses		20.0%	m3/annum	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417
Unavoidable annual real losses		2.0	m3/annum	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Potential saving (Real losses)			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**
% return flow			m3/annum	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Return flow			m3/annum	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064
Target Sysem Input Volume			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**
% Reduction			**%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	20%	m3/annum	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570
Mains replacement	Replace _% per annum, Saving 200l/km/h	5%	m3/annum	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	10	m3/annum	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262
Water Wise Gardening	Reduce billed consumption by _% for 1/3	7.5%	m3/annum	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389
Total direct interventions			**m3/annum**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**
Indirect measureable interventions																			
Sectorisation																			
Legislation																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
Other interventions			**m3/annum**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**
Total estimated savings			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**
System Input Volume with WCWDM			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**
% Reduction			**%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
Meter reading, billing & cost recovery			m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022
		OPEX	Rands	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044
Pressure management		CAPEX	Rands																
		OPEX	Rands	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands																
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands																
	R 5 / consumer / month	OPEX	Rands	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening	R 2000 per customer	CAPEX	Rands																
		OPEX	Rands																
TOTAL COSTS		**CAPEX**	Rands	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**
		OPEX	Rands	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**
		TOTAL	Rands	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**
		REDUCED PAYMENT		**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**
		ADDITIONAL INCOME		**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipali	eThekwini		Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
System input volume without WCWDM			**m3/annum**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**304 960 009**	**14 028 160 414**	**304 960 009**
Billed consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	9 883 356 068	214 855 567
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	214 855 567	9 883 356 068	214 855 567
Unbilled potential paid consumption	% of system input volume	4.0%	m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	561 126 417	12 198 400
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	133 812 027	2 908 957
Total potential revenue water		75%	**m3/annum**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**229 962 924**	**10 578 294 512**	**229 962 924**
Non-revenue water			**m3/annum**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**74 997 085**	**3 449 865 902**	**74 997 085**
Unbilled consumption	% of system input volume	1.0%	m3/annum	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	3 049 600	140 281 604	3 049 600
Apparent losses		20.0%	m3/annum	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	14 999 417	689 973 180	14 999 417
Unavoidable annual real losses		2.0	m3/annum	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	29 696 721	1 366 049 175	29 696 721
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
Potential saving (Real losses)			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**1 253 561 942**	**27 251 347**
% return flow			m3/annum	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	61%	61%
Return flow			m3/annum	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	194 396 064	8 608 968 535	187 151 490
Target Sysem Input Volume			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**12 774 598 472**	**277 708 662**
% Reduction			**%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	20%	m3/annum	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	4 905 570	198 675 568	4 319 034
Mains replacement	Replace _% per annum, Saving 200l/km/h	5%	m3/annum	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	2 241 246	93 011 709	2 021 994
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	2 750 899	114 162 317	2 481 789
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	10	m3/annum	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	4 848 262	196 354 605	4 268 578
Water Wise Gardening	Reduce billed consumption by _% for 1/3	7.5%	m3/annum	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	5 371 389	217 541 261	4 729 158
Total direct interventions			**m3/annum**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**20 117 366**	**819 745 460**	**17 820 553**
Indirect measureable interventions																			
Sectorisation																			
Legislation																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2%	2%
Other interventions			**m3/annum**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**7 133 981**	**288 926 221**	**6 281 005**
Total estimated savings			**m3/annum**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**27 251 347**	**1 108 671 681**	**24 101 558**
System Input Volume with WCWDM			**m3/annum**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**277 708 662**	**12 919 488 733**	**280 858 451**
% Reduction			**%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**8%**	**8%**
Meter reading, billing & cost recovery			m3/annum	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	12 198 400	494 035 215	10 739 896
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	404 022	**23 029 244**	**500 636**
		OPEX	Rands	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	808 044	**37 170 008**	**808 044**
Pressure management		CAPEX	Rands															**20 000 000**	**2 000 000**
		OPEX	Rands	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	2 008 044	**92 370 008**	**2 008 044**
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	7 675 500	**353 073 000**	**7 675 500**
		OPEX	Rands															**0**	**0**
Active and passive leakage control		CAPEX	Rands															**0**	**0**
	R 1500 / km	OPEX	Rands	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	15 351 000	**706 146 000**	**15 351 000**
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands															**40 402 182**	**4 040 218**
		OPEX	Rands															**0**	**0**
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	3 636 196	**167 265 034**	**3 636 196**
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Education and awareness campaigns		CAPEX	Rands															**0**	**0**
	R 5 / consumer / month	OPEX	Rands	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	48 482 619	**2 230 200 455**	**48 482 619**
Water audits / manage KPI's		CAPEX	Rands															**0**	**0**
	R 1500 / zone / month	OPEX	Rands	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	2 908 957	**133 812 027**	**2 908 957**
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands															**25 000 000**	**2 500 000**
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	641 609	**29 514 002**	**641 609**
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands															**40 402 182**	**4 040 218**
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Water Wise Gardening	R 2000 per customer	CAPEX	Rands															**457 891 398**	**45 789 140**
		OPEX	Rands																
TOTAL COSTS		**CAPEX**	Rands	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**11 715 718**	**1 127 063 040**	**24 501 370**
		OPEX	Rands	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**70 200 272**	**3 229 212 499**	**70 200 272**
		TOTAL	Rands	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**81 915 990**	**4 356 275 539**	**94 701 642**
		REDUCED PAYMENT		**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**81 754 040**	**3 326 015 043**	**72 304 675**
		ADDITIONAL INCOME		**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**73 190 402**	**2 964 211 287**	**64 439 376**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

				Discount rate :	6%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**			**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Sectorisation		CAPEX	Rands			808 044	762 305	719 156	678 449	640 046	603 817	569 639	537 395	506 977	478 280	451 207	212 834	200 786	189 421	178 699	168 584
		OPEX	Rands			808 044	762 305	719 156	678 449	640 046	603 817	569 639	537 395	506 977	478 280	451 207	425 667	401 573	378 842	357 398	337 168
Pressure management		CAPEX	Rands			0	1 886 792	1 779 993	1 679 239	1 584 187	1 494 516	1 409 921	1 330 114	1 254 825	1 183 797	1 116 790	0	0	0	0	0
		OPEX	Rands			2 008 044	1 894 381	1 787 152	1 685 992	1 590 559	1 500 527	1 415 592	1 335 464	1 259 871	1 188 558	1 121 281	1 057 812	997 936	941 449	888 160	837 886
Mains replacement		CAPEX	Rands			7 675 500	7 241 038	6 831 168	6 444 498	6 079 715	5 735 580	5 410 925	5 104 646	4 815 704	4 543 117	4 285 959	4 043 358	3 814 488	3 598 574	3 394 881	3 202 718
		OPEX	Rands			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands			15 351 000	14 482 075	13 662 335	12 888 996	12 159 430	11 471 160	10 821 849	10 209 292	9 631 407	9 086 233	8 571 918	8 086 715	7 628 977	7 197 148	6 789 762	6 405 436
Retrofitting & removal of wasteful devices		CAPEX	Rands			0	3 811 527	3 595 780	3 392 245	3 200 231	3 019 086	2 848 194	2 686 976	2 534 883	2 391 399	2 256 037	0	0	0	0	0
		OPEX	Rands			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands			3 636 196	3 430 374	3 236 202	3 053 021	2 880 208	2 717 177	2 563 375	2 418 278	2 281 395	2 152 259	2 030 433	1 915 503	1 807 078	1 704 791	1 608 293	1 517 258
		OPEX	Rands			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands			48 482 619	45 738 319	43 149 358	40 706 941	38 402 775	36 229 033	34 178 333	32 243 710	30 418 595	28 696 787	27 072 441	25 540 039	24 094 376	22 730 543	21 443 909	20 230 103
Water audits / manage KPI's		CAPEX	Rands			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands			2 908 957	2 744 299	2 588 961	2 442 416	2 304 166	2 173 742	2 050 700	1 934 623	1 825 116	1 721 807	1 624 346	1 532 402	1 445 663	1 363 833	1 286 635	1 213 806
Management meters		CAPEX	Rands			0	2 358 491	2 224 991	2 099 048	1 980 234	1 868 145	1 762 401	1 662 643	1 568 531	1 479 746	1 395 987	0	0	0	0	0
		OPEX	Rands			641 609	605 291	571 029	538 707	508 214	479 447	452 309	426 706	402 553	379 767	358 271	337 991	318 860	300 811	283 784	267 721
Consumer meters		CAPEX	Rands			0	3 811 527	3 595 780	3 392 245	3 200 231	3 019 086	2 848 194	2 686 976	2 534 883	2 391 399	2 256 037	0	0	0	0	0
		OPEX	Rands			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands			0	43 197 302	40 752 171	38 445 445	36 269 287	34 216 309	32 279 537	30 452 393	28 728 673	27 102 521	25 568 416	0	0	0	0	0
		OPEX	Rands			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**				**12 119 740**	**66 499 355**	**62 735 241**	**59 184 189**	**55 834 141**	**52 673 718**	**49 692 186**	**46 879 421**	**44 225 869**	**41 722 518**	**39 360 866**	**6 171 694**	**5 822 353**	**5 492 786**	**5 181 873**	**4 888 560**
		OPEX				**70 200 272**	**66 226 671**	**62 477 992**	**58 941 502**	**55 605 190**	**52 457 727**	**49 488 421**	**46 687 190**	**44 044 519**	**41 551 433**	**39 199 465**	**36 980 627**	**34 887 384**	**32 912 627**	**31 049 648**	**29 292 121**
		TOTAL				**82 320 012**	**132 726 026**	**125 213 232**	**118 125 691**	**111 439 331**	**105 131 444**	**99 180 608**	**93 566 611**	**88 270 388**	**83 273 951**	**78 560 331**	**43 152 322**	**40 709 737**	**38 405 413**	**36 231 521**	**34 180 681**
		REDUCED PAYMENT				**1 497 644**	**9 125 517**	**15 885 058**	**21 850 131**	**27 089 017**	**31 664 814**	**35 635 803**	**39 055 792**	**41 974 437**	**44 437 534**	**45 651 029**	**43 067 008**	**40 629 253**	**38 329 484**	**36 159 891**	**34 113 104**
		ADDITIONAL INCOME				**0**	**6 904 755**	**13 027 839**	**18 435 622**	**23 189 462**	**27 346 063**	**30 957 807**	**34 073 058**	**36 736 451**	**38 989 158**	**40 869 138**	**38 555 791**	**36 373 388**	**34 314 517**	**32 372 185**	**30 539 798**
		CBR				**54.97**	**14.54**	**7.88**	**5.41**	**4.11**	**3.32**	**2.78**	**2.40**	**2.10**	**1.87**	**1.72**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

				6%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Pressure management			m3/annum		0	462 790	873 188	1 235 643	1 554 268	1 832 863	2 074 940	2 283 739	2 462 252	2 613 239	2 739 244	2 584 193	2 437 918	2 299 922	2 169 738	2 046 923
Mains replacement			m3/annum		224 125	422 877	598 410	752 717	887 638	1 004 874	1 105 993	1 192 445	1 265 567	1 326 590	1 251 500	1 180 660	1 113 831	1 050 784	991 305	935 194
Active and passive leakage control			m3/annum		275 090	519 038	734 487	923 883	1 089 485	1 233 379	1 357 493	1 463 604	1 553 353	1 628 253	1 536 088	1 449 139	1 367 113	1 289 729	1 216 725	1 147 854
Retrofitting & removal of wasteful devices			m3/annum		0	457 383	862 987	1 221 208	1 536 111	1 811 452	2 050 700	2 257 060	2 433 488	2 582 711	2 707 244	2 554 004	2 409 438	2 273 054	2 144 391	2 023 010
Water Wise Gardening			m3/annum		0	506 735	956 103	1 352 977	1 701 857	2 006 907	2 271 970	2 500 596	2 696 061	2 861 385	2 999 356	2 829 581	2 669 416	2 518 317	2 375 771	2 241 293
Meter reading, billing & cost recovery			m3/annum		0	1 150 792	2 171 307	3 072 604	3 864 910	4 557 677	5 159 635	5 678 843	6 122 742	6 498 193	6 811 523	6 425 965	6 062 231	5 719 086	5 395 364	5 089 966
Water Use Efficiency			m3/annum		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum		0	673 017	1 269 843	1 796 948	2 260 312	2 665 463	3 017 505	3 321 153	3 580 758	3 800 333	3 983 578	3 758 092	3 545 370	3 344 689	3 155 367	2 976 761
Total			**m3/annum**		**499 215**	**4 192 631**	**7 466 326**	**10 355 981**	**12 894 582**	**15 112 615**	**17 038 235**	**18 697 441**	**20 114 221**	**21 310 704**	**22 028 533**	**20 781 635**	**19 605 316**	**18 495 581**	**17 448 661**	**16 461 001**

Unit reference values																				
All interventions				**164.9**	**31.7**	**16.8**	**11.4**	**8.6**	**7.0**	**5.8**	**5.0**	**4.4**	**3.9**	**3.6**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management					8.2	4.1	2.7	2.0	1.6	1.4	1.2	1.0	0.9	0.8	0.4	0.4	0.4	0.4	0.4
Mains replacement				34.2	17.1	11.4	8.6	6.8	5.7	4.9	4.3	3.8	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				55.8	27.9	18.6	14.0	11.2	9.3	8.0	7.0	6.2	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices					8.3	4.2	2.8	2.1	1.7	1.4	1.2	1.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					85.2	42.6	28.4	21.3	17.0	14.2	12.2	10.7	9.5	8.5	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					6.3	3.1	2.1	1.6	1.3	1.0	0.9	0.8	0.7	0.6	0.3	0.3	0.3	0.3	0.3
Management					21.5	10.7	7.2	5.4	4.3	3.6	3.1	2.7	2.4	2.1	1.3	1.3	1.3	1.3	1.3
Awareness campaigns & Efficiency					135.9	68.0	45.3	34.0	27.2	22.7	19.4	17.0	15.1	13.6	13.6	13.6	13.6	13.6	13.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 6%

Net present cost			Unit	16 2022-23	17 2023-24	18 2024-25	19 2025-26	20 2026-27	21 2027-28	22 2028-29	23 2029-30	24 2030-31	25 2031-32	26 2032-33	27 2033-34	28 2034-35	29 2035-36	30 2036-37	31 2037-38
Sectorisation		CAPEX	Rands	159 042	150 039	141 547	133 534	125 976	118 845	112 118	105 772	99 785	94 137	88 808	83 781	79 039	74 565	70 344	66 363
		OPEX	Rands	318 083	300 079	283 093	267 069	251 952	237 690	224 236	211 544	199 569	188 273	177 616	167 562	158 078	149 130	140 689	132 725
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	790 459	745 716	703 506	663 685	626 117	590 677	557 242	525 700	495 944	467 871	441 388	416 404	392 834	370 598	349 621	329 831
Mains replacement		CAPEX	Rands	3 021 432	2 850 408	2 689 064	2 536 853	2 393 257	2 257 790	2 129 990	2 009 425	1 895 684	1 788 381	1 687 152	1 591 653	1 501 559	1 416 565	1 336 382	1 260 738
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	6 042 864	5 700 815	5 378 128	5 073 705	4 786 514	4 515 580	4 259 981	4 018 850	3 791 368	3 576 762	3 374 304	3 183 305	3 003 118	2 833 130	2 672 765	2 521 476
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	1 431 375	1 350 354	1 273 919	1 201 810	1 133 783	1 069 607	1 009 063	951 946	898 063	847 229	799 272	754 031	711 350	671 085	633 099	597 263
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	19 085 003	18 004 719	16 985 584	16 024 136	15 117 110	14 261 424	13 454 174	12 692 617	11 974 167	11 296 384	10 656 966	10 053 741	9 484 662	8 947 794	8 441 315	7 963 505
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 145 100	1 080 283	1 019 135	961 448	907 027	855 685	807 250	761 557	718 450	677 783	639 418	603 224	569 080	536 868	506 479	477 810
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	252 567	238 271	224 784	212 060	200 057	188 733	178 050	167 971	158 464	149 494	141 032	133 049	125 518	118 413	111 711	105 387
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**4 611 849**	**4 350 801**	**4 104 529**	**3 872 197**	**3 653 016**	**3 446 242**	**3 251 172**	**3 067 143**	**2 893 531**	**2 729 746**	**2 575 232**	**2 429 464**	**2 291 948**	**2 162 215**	**2 039 825**	**1 924 363**
		OPEX		**27 634 076**	**26 069 883**	**24 594 229**	**23 202 103**	**21 888 777**	**20 649 789**	**19 480 933**	**18 378 239**	**17 337 961**	**16 356 567**	**15 430 724**	**14 557 287**	**13 733 289**	**12 955 933**	**12 222 578**	**11 530 734**
		TOTAL		**32 245 925**	**30 420 684**	**28 698 758**	**27 074 300**	**25 541 793**	**24 096 031**	**22 732 105**	**21 445 382**	**20 231 492**	**19 086 313**	**18 005 956**	**16 986 751**	**16 025 237**	**15 118 148**	**14 262 404**	**13 455 098**
		REDUCED PAYMENT		**32 182 174**	**30 360 541**	**28 642 020**	**27 020 774**	**25 491 296**	**24 048 392**	**22 687 163**	**21 402 984**	**20 191 494**	**19 048 579**	**17 970 358**	**16 953 168**	**15 993 554**	**15 088 259**	**14 234 207**	**13 428 497**
		ADDITIONAL INCOME		**28 811 130**	**27 180 311**	**25 641 803**	**24 190 380**	**22 821 113**	**21 529 352**	**20 310 710**	**19 161 047**	**18 076 459**	**17 053 263**	**16 087 984**	**15 177 344**	**14 318 249**	**13 507 782**	**12 743 191**	**12 021 878**
		CBR		**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

Net present saving			Unit	6% 16 2022-23	17 2023-24	18 2024-25	19 2025-26	20 2026-27	21 2027-28	22 2028-29	23 2029-30	24 2030-31	25 2031-32	26 2032-33	27 2033-34	28 2034-35	29 2035-36	30 2036-37	31 2037-38
Pressure management			m3/annum	1 931 059	1 821 754	1 718 636	1 621 355	1 529 580	1 443 000	1 361 321	1 284 265	1 211 570	1 142 991	1 078 293	1 017 258	959 677	905 356	854 109	805 764
Mains replacement			m3/annum	882 258	832 319	785 207	740 761	698 831	659 275	621 957	586 752	553 540	522 207	492 648	464 763	438 455	413 637	390 224	368 136
Active and passive leakage control			m3/annum	1 082 881	1 021 586	963 760	909 208	857 743	809 192	763 389	720 178	679 413	640 956	604 675	570 448	538 159	507 697	478 959	451 849
Retrofitting & removal of wasteful devices			m3/annum	1 908 500	1 800 472	1 698 558	1 602 414	1 511 711	1 426 142	1 345 417	1 269 262	1 197 417	1 129 638	1 065 697	1 005 374	948 466	894 779	844 132	796 350
Water Wise Gardening			m3/annum	2 114 427	1 994 743	1 881 833	1 775 314	1 674 825	1 580 023	1 490 588	1 406 215	1 326 618	1 251 526	1 180 685	1 113 854	1 050 806	991 326	935 213	882 277
Meter reading, billing & cost recovery			m3/annum	4 801 855	4 530 052	4 273 634	4 031 730	3 803 519	3 588 225	3 385 118	3 193 508	3 012 743	2 842 211	2 681 331	2 529 557	2 386 375	2 251 297	2 123 865	2 003 646
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	2 808 265	2 649 307	2 499 346	2 357 873	2 224 409	2 098 499	1 979 716	1 867 657	1 761 940	1 662 208	1 568 121	1 479 359	1 395 622	1 316 624	1 242 098	1 171 791
Total			**m3/annum**	**15 529 246**	**14 650 232**	**13 820 974**	**13 038 655**	**12 300 618**	**11 604 356**	**10 947 506**	**10 327 836**	**9 743 241**	**9 191 737**	**8 671 450**	**8 180 613**	**7 717 560**	**7 280 717**	**6 868 601**	**6 479 812**

Unit reference values																			
All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management				1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Awareness campaigns & Efficiency				13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 6%

Net present cost			Unit	32 2038-39	33 2039-40	34 2040-41	35 2041-42	36 2042-43	37 2043-44	38 2044-45	39 2045-46	40 2046-47	41 2047-48	42 2048-49	43 2049-50	44 2050-51	45 2051-52	Total	Average
Sectorisation		CAPEX	Rands	62 606	59 062	55 719	52 565	49 590	46 783	44 135	41 637	39 280	37 056	34 959	32 980	31 113	29 352	10 026 173	217 960
		OPEX	Rands	125 212	118 125	111 439	105 131	99 180	93 566	88 270	83 273	78 560	74 113	69 918	65 960	62 227	58 704	13 297 031	289 066
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 720 174	320 004
		OPEX	Rands	311 161	293 548	276 932	261 257	246 469	232 518	219 356	206 940	195 226	184 176	173 751	163 916	154 638	145 885	33 044 029	718 348
Mains replacement		CAPEX	Rands	1 189 375	1 122 052	1 058 540	998 623	942 097	888 771	838 463	791 003	746 229	703 990	664 141	626 548	591 083	557 626	126 306 739	2 745 799
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 378 751	2 244 105	2 117 080	1 997 245	1 884 194	1 777 541	1 676 926	1 582 005	1 492 458	1 407 979	1 328 282	1 253 096	1 182 166	1 115 251	252 613 478	5 491 597
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29 736 358	646 443
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	563 456	531 562	501 473	473 088	446 310	421 047	397 214	374 730	353 519	333 508	314 631	296 821	280 020	264 170	59 836 637	1 300 796
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	7 512 740	7 087 491	6 686 312	6 307 842	5 950 794	5 613 957	5 296 186	4 996 401	4 713 586	4 446 779	4 195 075	3 957 618	3 733 602	3 522 266	797 821 831	17 343 953
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	450 764	425 249	401 179	378 471	357 048	336 837	317 771	299 784	282 815	266 807	251 704	237 457	224 016	211 336	47 869 310	1 040 637
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18 400 218	400 005
		OPEX	Rands	99 422	93 794	88 485	83 477	78 752	74 294	70 089	66 121	62 379	58 848	55 517	52 374	49 410	46 613	10 558 206	229 526
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29 736 358	646 443
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	337 012 055	7 326 349
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**1 815 437**	**1 712 677**	**1 615 733**	**1 524 276**	**1 437 996**	**1 356 600**	**1 279 812**	**1 207 369**	**1 139 028**	**1 074 554**	**1 013 731**	**956 350**	**902 217**	**851 148**	**625 774 711**	**13 603 798**
		OPEX		**10 878 051**	**10 262 313**	**9 681 427**	**9 133 422**	**8 616 436**	**8 128 713**	**7 668 597**	**7 234 525**	**6 825 024**	**6 438 702**	**6 074 247**	**5 730 422**	**5 406 058**	**5 100 055**	**1 155 203 884**	**25 113 128**
		TOTAL		**12 693 489**	**11 974 989**	**11 297 160**	**10 657 698**	**10 054 432**	**9 485 313**	**8 948 409**	**8 441 895**	**7 964 052**	**7 513 256**	**7 087 978**	**6 686 771**	**6 308 275**	**5 951 203**	**1 780 978 596**	**38 716 926**
		REDUCED PAYMENT		**12 668 393**	**11 951 314**	**11 274 825**	**10 636 627**	**10 034 554**	**9 466 560**	**8 930 717**	**8 425 205**	**7 948 307**	**7 498 402**	**7 073 965**	**6 673 551**	**6 295 803**	**5 939 437**	**975 726 636**	**21 211 449**
		ADDITIONAL INCOME		**11 341 394**	**10 699 428**	**10 093 800**	**9 522 453**	**8 983 446**	**8 474 949**	**7 995 235**	**7 542 675**	**7 115 731**	**6 712 954**	**6 332 975**	**5 974 505**	**5 636 325**	**5 317 288**	**863 060 189**	**18 762 178**
		CBR		**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.83**	**1.83**

6%

Net present saving			Unit	32 2038-39	33 2039-40	34 2040-41	35 2041-42	36 2042-43	37 2043-44	38 2044-45	39 2045-46	40 2046-47	41 2047-48	42 2048-49	43 2049-50	44 2050-51	45 2051-52	Total	Average
Pressure management			m3/annum	760 154	717 127	676 535	638 240	602 113	568 032	535 879	505 546	476 930	449 934	424 466	400 440	377 773	356 390	**57 846 407**	**1 257 531**
Mains replacement			m3/annum	347 298	327 639	309 094	291 598	275 092	259 521	244 831	230 973	217 899	205 565	193 929	182 952	172 596	162 827	**28 177 292**	**612 550**
Active and passive leakage control			m3/annum	426 272	402 144	379 381	357 906	337 647	318 535	300 505	283 495	267 448	252 310	238 028	224 555	211 844	199 853	**34 584 731**	**751 842**
Retrofitting & removal of wasteful devices			m3/annum	751 274	708 749	668 631	630 784	595 079	561 396	529 619	499 640	471 359	444 678	419 507	395 762	373 360	352 227	**57 170 635**	**1 242 840**
Water Wise Gardening			m3/annum	832 336	785 223	740 777	698 846	659 288	621 970	586 764	553 551	522 218	492 659	464 772	438 464	413 646	390 232	**63 339 345**	**1 376 942**
Meter reading, billing & cost recovery			m3/annum	1 890 232	1 783 238	1 682 300	1 587 076	1 497 241	1 412 492	1 332 539	1 257 112	1 185 955	1 118 826	1 055 496	995 751	939 388	886 215	**143 843 365**	**3 127 030**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	1 105 463	1 042 890	983 858	928 168	875 630	826 066	779 308	735 196	693 581	654 322	617 285	582 344	549 381	518 284	**84 123 800**	**1 828 778**
Total			**m3/annum**	**6 113 030**	**5 767 010**	**5 440 575**	**5 132 618**	**4 842 092**	**4 568 012**	**4 309 445**	**4 065 514**	**3 835 391**	**3 618 293**	**3 413 484**	**3 220 268**	**3 037 989**	**2 866 027**	**469 085 577**	**10 197 513**

Unit reference values

All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**3.8**	**3.8**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.8	0.8
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.5	4.5
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	7.3	7.3
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	5.3
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6
Management				1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2.4	2.4
Awareness campaigns & Efficiency				13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	19.0	19.0

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 8%

Net present cost			Unit	0 2006-07	1 2007-08	2 2008-09	3 2009-10	4 2010-11	5 2011-12	6 2012-13	7 2013-14	8 2014-15	9 2015-16	10 2016-17	11 2017-18	12 2018-19	13 2019-20	14 2020-21	15 2021-22
Sectorisation		CAPEX	Rands	808 044	748 189	692 767	641 451	593 936	549 941	509 205	471 486	436 561	404 223	374 281	173 278	160 443	148 558	137 554	127 365
		OPEX	Rands	808 044	748 189	692 767	641 451	593 936	549 941	509 205	471 486	436 561	404 223	374 281	346 556	320 885	297 116	275 107	254 729
Pressure management		CAPEX	Rands	0	1 851 852	1 714 678	1 587 664	1 470 060	1 361 166	1 260 339	1 166 981	1 080 538	1 000 498	926 387	0	0	0	0	0
		OPEX	Rands	2 008 044	1 859 300	1 721 574	1 594 050	1 475 972	1 366 641	1 265 408	1 171 674	1 084 883	1 004 522	930 113	861 215	797 422	738 353	683 661	633 019
Mains replacement		CAPEX	Rands	7 675 500	7 106 944	6 580 504	6 093 059	5 641 722	5 223 816	4 836 867	4 478 581	4 146 834	3 839 661	3 555 242	3 291 890	3 048 047	2 822 265	2 613 209	2 419 638
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	15 351 000	14 213 889	13 161 008	12 186 119	11 283 443	10 447 633	9 673 734	8 957 161	8 293 668	7 679 322	7 110 483	6 583 781	6 096 093	5 644 531	5 226 417	4 839 275
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	3 740 943	3 463 836	3 207 255	2 969 681	2 749 705	2 546 023	2 357 429	2 182 804	2 021 115	1 871 403	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	3 636 196	3 366 849	3 117 452	2 886 530	2 672 713	2 474 734	2 291 421	2 121 686	1 964 524	1 819 003	1 684 262	1 559 502	1 443 984	1 337 022	1 237 983	1 146 281
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	48 482 619	44 891 314	41 566 031	38 487 066	35 636 172	32 996 456	30 552 274	28 289 142	26 193 650	24 253 380	22 456 833	20 793 364	19 253 115	17 826 958	16 506 443	15 283 743
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 908 957	2 693 479	2 493 962	2 309 224	2 138 170	1 979 787	1 833 136	1 697 349	1 571 619	1 455 203	1 347 410	1 247 602	1 155 187	1 069 617	990 387	917 025
Management meters		CAPEX	Rands	0	2 314 815	2 143 347	1 984 581	1 837 575	1 701 458	1 575 424	1 458 726	1 350 672	1 250 622	1 157 984	0	0	0	0	0
		OPEX	Rands	641 609	594 082	550 076	509 330	471 602	436 668	404 322	374 373	346 641	320 964	297 189	275 175	254 792	235 918	218 443	202 262
Consumer meters		CAPEX	Rands	0	3 740 943	3 463 836	3 207 255	2 969 681	2 749 705	2 546 023	2 357 429	2 182 804	2 021 115	1 871 403	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	42 397 352	39 256 807	36 348 895	33 656 385	31 163 319	28 854 925	26 717 523	24 738 447	22 905 970	21 209 231	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**12 119 740**	**65 267 885**	**60 433 227**	**55 956 692**	**51 811 752**	**47 973 844**	**44 420 226**	**41 129 839**	**38 083 184**	**35 262 208**	**32 650 192**	**5 024 671**	**4 652 473**	**4 307 845**	**3 988 746**	**3 693 283**
		OPEX		**70 200 272**	**65 000 252**	**60 185 418**	**55 727 239**	**51 599 295**	**47 777 125**	**44 238 079**	**40 961 184**	**37 927 022**	**35 117 613**	**32 516 309**	**30 107 693**	**27 877 494**	**25 812 494**	**23 900 458**	**22 130 053**
		TOTAL		**82 320 012**	**130 268 137**	**120 618 645**	**111 683 931**	**103 411 047**	**95 750 970**	**88 658 305**	**82 091 023**	**76 010 207**	**70 379 821**	**65 166 501**	**35 132 364**	**32 529 967**	**30 120 339**	**27 889 203**	**25 823 336**
		REDUCED PAYMENT		**1 497 644**	**8 956 525**	**15 302 170**	**20 658 576**	**25 137 477**	**28 839 484**	**31 855 117**	**34 265 748**	**36 144 461**	**37 556 831**	**37 867 939**	**35 062 906**	**32 465 654**	**30 060 791**	**27 834 065**	**25 772 283**
		ADDITIONAL INCOME		**0**	**6 776 889**	**12 549 795**	**17 430 270**	**21 518 852**	**24 906 079**	**27 673 421**	**29 894 128**	**31 633 998**	**32 952 081**	**33 901 318**	**31 390 109**	**29 064 916**	**26 911 959**	**24 918 481**	**23 072 667**
		CBR		**54.97**	**14.54**	**7.88**	**5.41**	**4.11**	**3.32**	**2.78**	**2.40**	**2.10**	**1.87**	**1.72**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

8%

Net present saving			Unit	0 2006-07	1 2007-08	2 2008-09	3 2009-10	4 2010-11	5 2011-12	6 2012-13	7 2013-14	8 2014-15	9 2015-16	10 2016-17	11 2017-18	12 2018-19	13 2019-20	14 2020-21	15 2021-22
Pressure management			m3/annum	0	454 219	841 147	1 168 260	1 442 296	1 669 324	1 854 805	2 003 647	2 120 261	2 208 606	2 272 228	2 103 915	1 948 069	1 803 768	1 670 155	1 546 440
Mains replacement			m3/annum	224 125	415 046	576 452	711 669	823 691	915 213	988 656	1 046 196	1 089 788	1 121 181	1 038 131	961 232	890 030	824 102	763 057	706 534
Active and passive leakage control			m3/annum	275 090	509 426	707 536	873 501	1 010 997	1 123 329	1 213 473	1 284 099	1 337 603	1 376 134	1 274 199	1 179 814	1 092 420	1 011 500	936 574	867 198
Retrofitting & removal of wasteful devices			m3/annum	0	448 913	831 321	1 154 612	1 425 447	1 649 823	1 833 136	1 980 240	2 095 492	2 182 804	2 245 683	2 079 336	1 925 311	1 782 696	1 650 644	1 528 374
Water Wise Gardening			m3/annum	0	497 351	921 020	1 279 195	1 579 253	1 827 839	2 030 932	2 193 908	2 321 596	2 418 329	2 487 992	2 303 697	2 133 053	1 975 049	1 828 749	1 693 286
Meter reading, billing & cost recovery			m3/annum	0	1 129 482	2 091 632	2 905 045	3 586 475	4 151 013	4 612 237	4 982 355	5 272 333	5 492 013	5 650 220	5 231 685	4 844 153	4 485 326	4 153 080	3 845 445
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	0	660 554	1 223 248	1 698 955	2 097 476	2 427 634	2 697 371	2 913 826	3 083 414	3 211 890	3 304 413	3 059 642	2 833 002	2 623 150	2 428 843	2 248 928
Total			**m3/annum**	**499 215**	**4 114 990**	**7 192 356**	**9 791 237**	**11 965 634**	**13 764 174**	**15 230 609**	**16 404 271**	**17 320 487**	**18 010 957**	**18 272 866**	**16 919 320**	**15 666 037**	**14 505 590**	**13 431 102**	**12 436 205**

Unit reference values

All interventions				**164.9**	**31.7**	**16.8**	**11.4**	**8.6**	**7.0**	**5.8**	**5.0**	**4.4**	**3.9**	**3.6**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management					8.2	4.1	2.7	2.0	1.6	1.4	1.2	1.0	0.9	0.8	0.4	0.4	0.4	0.4	0.4
Mains replacement				34.2	17.1	11.4	8.6	6.8	5.7	4.9	4.3	3.8	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				55.8	27.9	18.6	14.0	11.2	9.3	8.0	7.0	6.2	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices					8.3	4.2	2.8	2.1	1.7	1.4	1.2	1.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					85.2	42.6	28.4	21.3	17.0	14.2	12.2	10.7	9.5	8.5	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					6.3	3.1	2.1	1.6	1.3	1.0	0.9	0.8	0.7	0.6	0.3	0.3	0.3	0.3	0.3
Management					21.5	10.7	7.2	5.4	4.3	3.6	3.1	2.7	2.4	2.1	1.3	1.3	1.3	1.3	1.3
Awareness campaigns & Efficiency					135.9	68.0	45.3	34.0	27.2	22.7	19.4	17.0	15.1	13.6	13.6	13.6	13.6	13.6	13.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 8%

Net present cost			Unit	16 2022-23	17 2023-24	18 2024-25	19 2025-26	20 2026-27	21 2027-28	22 2028-29	23 2029-30	24 2030-31	25 2031-32	26 2032-33	27 2033-34	28 2034-35	29 2035-36	30 2036-37	31 2037-38
Sectorisation		CAPEX	Rands	117 930	109 195	101 106	93 617	86 682	80 261	74 316	68 811	63 714	58 994	54 624	50 578	46 832	43 363	40 151	37 176
		OPEX	Rands	235 860	218 389	202 212	187 233	173 364	160 523	148 632	137 622	127 428	117 989	109 249	101 156	93 663	86 725	80 301	74 353
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	586 129	542 712	502 511	465 288	430 822	398 909	369 361	342 001	316 667	293 210	271 491	251 381	232 760	215 518	199 554	184 772
Mains replacement		CAPEX	Rands	2 240 405	2 074 449	1 920 786	1 778 506	1 646 765	1 524 782	1 411 835	1 307 255	1 210 421	1 120 760	1 037 741	960 871	889 696	823 792	762 771	706 269
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	4 480 811	4 148 899	3 841 573	3 557 012	3 293 530	3 049 564	2 823 671	2 614 510	2 420 843	2 241 521	2 075 482	1 921 743	1 779 392	1 647 585	1 525 541	1 412 538
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	1 061 371	982 751	909 955	842 551	780 139	722 351	668 844	619 300	573 426	530 950	491 620	455 204	421 485	390 264	361 355	334 588
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	14 151 614	13 103 346	12 132 728	11 234 008	10 401 859	9 631 351	8 917 917	8 257 331	7 645 677	7 079 330	6 554 936	6 069 385	5 619 801	5 203 519	4 818 073	4 461 179
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	849 097	786 201	727 964	674 040	624 112	577 881	535 075	495 440	458 741	424 760	393 296	364 163	337 188	312 211	289 084	267 671
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	187 279	173 407	160 562	148 668	137 656	127 459	118 018	109 276	101 181	93 686	86 747	80 321	74 371	68 862	63 761	59 038
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**3 419 706**	**3 166 395**	**2 931 847**	**2 714 673**	**2 513 586**	**2 327 395**	**2 154 995**	**1 995 366**	**1 847 561**	**1 710 705**	**1 583 986**	**1 466 653**	**1 358 012**	**1 257 419**	**1 164 277**	**1 078 034**
		OPEX		**20 490 790**	**18 972 954**	**17 567 550**	**16 266 250**	**15 061 342**	**13 945 687**	**12 912 674**	**11 956 179**	**11 070 536**	**10 250 497**	**9 491 201**	**8 788 149**	**8 137 175**	**7 534 421**	**6 976 316**	**6 459 552**
		TOTAL		**23 910 497**	**22 139 349**	**20 499 397**	**18 980 923**	**17 574 929**	**16 273 082**	**15 067 669**	**13 951 545**	**12 918 097**	**11 961 201**	**11 075 186**	**10 254 802**	**9 495 187**	**8 791 840**	**8 140 593**	**7 537 586**
		REDUCED PAYMENT		**23 863 225**	**22 095 579**	**20 458 869**	**18 943 397**	**17 540 183**	**16 240 910**	**15 037 880**	**13 923 963**	**12 892 558**	**11 937 554**	**11 053 290**	**10 234 528**	**9 476 415**	**8 774 458**	**8 124 498**	**7 522 684**
		ADDITIONAL INCOME		**21 363 581**	**19 781 093**	**18 315 827**	**16 959 099**	**15 702 870**	**14 539 694**	**13 462 680**	**12 465 444**	**11 542 078**	**10 687 109**	**9 895 471**	**9 162 474**	**8 483 772**	**7 855 344**	**7 273 467**	**6 734 692**
		CBR		**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

8%

Net present saving			Unit	16 2022-23	17 2023-24	18 2024-25	19 2025-26	20 2026-27	21 2027-28	22 2028-29	23 2029-30	24 2030-31	25 2031-32	26 2032-33	27 2033-34	28 2034-35	29 2035-36	30 2036-37	31 2037-38
Pressure management			m3/annum	1 431 889	1 325 823	1 227 614	1 136 680	1 052 481	974 520	902 333	835 493	773 605	716 301	663 242	614 113	568 623	526 503	487 502	451 391
Mains replacement			m3/annum	654 198	605 739	560 870	519 324	480 855	445 236	412 256	381 718	353 443	327 262	303 020	280 574	259 791	240 547	222 729	206 231
Active and passive leakage control			m3/annum	802 961	743 483	688 410	637 417	590 200	546 482	506 002	468 520	433 815	401 681	371 926	344 376	318 867	295 247	273 377	253 127
Retrofitting & removal of wasteful devices			m3/annum	1 415 161	1 310 335	1 213 273	1 123 401	1 040 186	963 135	891 792	825 733	764 568	707 933	655 494	606 938	561 980	520 352	481 807	446 118
Water Wise Gardening			m3/annum	1 567 857	1 451 720	1 344 185	1 244 616	1 152 422	1 067 057	988 016	914 830	847 065	784 319	726 221	672 427	622 618	576 498	533 794	494 254
Meter reading, billing & cost recovery			m3/annum	3 560 597	3 296 849	3 052 638	2 826 517	2 617 145	2 423 282	2 243 780	2 077 574	1 923 680	1 781 185	1 649 245	1 527 079	1 413 962	1 309 224	1 212 244	1 122 449
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	2 082 341	1 928 093	1 785 272	1 653 029	1 530 583	1 417 206	1 312 228	1 215 026	1 125 024	1 041 689	964 527	893 080	826 926	765 672	708 956	656 441
Total			**m3/annum**	**11 515 005**	**10 662 042**	**9 872 261**	**9 140 982**	**8 463 872**	**7 836 919**	**7 256 406**	**6 718 895**	**6 221 199**	**5 760 369**	**5 333 675**	**4 938 588**	**4 572 767**	**4 234 043**	**3 920 411**	**3 630 010**

Unit reference values

All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management				1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Awareness campaigns & Efficiency				13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 8%

Net present cost			Unit	32 2038-39	33 2039-40	34 2040-41	35 2041-42	36 2042-43	37 2043-44	38 2044-45	39 2045-46	40 2046-47	41 2047-48	42 2048-49	43 2049-50	44 2050-51	45 2051-52	Total	Average
Sectorisation		CAPEX	Rands	34 423	31 873	29 512	27 326	25 302	23 427	21 692	20 085	18 598	17 220	15 944	14 763	13 670	12 657	8 411 121	182 850
		OPEX	Rands	68 845	63 746	59 024	54 652	50 603	46 855	43 384	40 171	37 195	34 440	31 889	29 527	27 339	25 314	10 592 161	230 264
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13 420 163	291 743
		OPEX	Rands	171 085	158 412	146 678	135 813	125 753	116 438	107 813	99 827	92 432	85 585	79 246	73 376	67 940	62 908	26 322 242	572 223
Mains replacement		CAPEX	Rands	653 953	605 512	560 659	519 129	480 675	445 069	412 101	381 575	353 310	327 139	302 907	280 469	259 694	240 457	100 613 536	2 187 251
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 307 906	1 211 024	1 121 318	1 038 258	961 350	890 139	824 203	763 151	706 621	654 279	605 813	560 938	519 387	480 914	201 227 071	4 374 502
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27 110 193	589 352
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	309 804	286 856	265 607	245 932	227 715	210 847	195 229	180 768	167 378	154 979	143 499	132 870	123 027	113 914	47 664 722	1 036 190
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	4 130 721	3 824 742	3 541 428	3 279 100	3 036 203	2 811 299	2 603 055	2 410 236	2 231 700	2 066 389	1 913 323	1 771 596	1 640 366	1 518 858	635 529 630	13 815 862
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	247 843	229 485	212 486	196 746	182 172	168 678	156 183	144 614	133 902	123 983	114 799	106 296	98 422	91 131	38 131 778	828 952
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16 775 203	364 678
		OPEX	Rands	54 665	50 616	46 867	43 395	40 180	37 204	34 448	31 897	29 534	27 346	25 321	23 445	21 708	20 100	8 410 465	182 836
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27 110 193	589 352
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	307 248 855	6 679 323
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**998 180**	**924 240**	**855 778**	**792 387**	**733 692**	**679 344**	**629 023**	**582 428**	**539 285**	**499 338**	**462 350**	**428 102**	**396 391**	**367 029**	**548 353 987**	**11 920 739**
		OPEX		**5 981 066**	**5 538 024**	**5 127 800**	**4 747 963**	**4 396 262**	**4 070 613**	**3 769 086**	**3 489 895**	**3 231 384**	**2 992 022**	**2 770 391**	**2 565 177**	**2 375 164**	**2 199 226**	**920 213 347**	**20 004 638**
		TOTAL		**6 979 246**	**6 462 265**	**5 983 579**	**5 540 351**	**5 129 954**	**4 749 958**	**4 398 109**	**4 072 323**	**3 770 669**	**3 491 361**	**3 232 741**	**2 993 279**	**2 771 555**	**2 566 254**	**1 468 567 334**	**31 925 377**
		REDUCED PAYMENT		**6 965 448**	**6 449 489**	**5 971 749**	**5 529 397**	**5 119 812**	**4 740 567**	**4 389 414**	**4 064 272**	**3 763 215**	**3 484 458**	**3 226 350**	**2 987 361**	**2 766 075**	**2 561 181**	**719 416 448**	**15 639 488**
		ADDITIONAL INCOME		**6 235 826**	**5 773 913**	**5 346 215**	**4 950 199**	**4 583 518**	**4 243 998**	**3 929 628**	**3 638 544**	**3 369 023**	**3 119 465**	**2 888 394**	**2 674 439**	**2 476 332**	**2 292 900**	**634 342 049**	**13 790 045**
		CBR		**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**2.04**	**2.04**

Net present saving			8% Unit	32 2038-39	33 2039-40	34 2040-41	35 2041-42	36 2042-43	37 2043-44	38 2044-45	39 2045-46	40 2046-47	41 2047-48	42 2048-49	43 2049-50	44 2050-51	45 2051-52	Total	Average
Pressure management			m3/annum	417 955	386 995	358 329	331 786	307 209	284 453	263 382	243 873	225 808	209 081	193 594	179 254	165 976	153 681	**42 516 627**	**924 275**
Mains replacement			m3/annum	190 954	176 810	163 713	151 586	140 357	129 960	120 334	111 420	103 167	95 525	88 449	81 897	75 831	70 213	**21 049 110**	**457 589**
Active and passive leakage control			m3/annum	234 377	217 015	200 940	186 056	172 274	159 513	147 697	136 757	126 626	117 247	108 562	100 520	93 074	86 180	**25 835 621**	**561 644**
Retrofitting & removal of wasteful devices			m3/annum	413 072	382 474	354 143	327 910	303 620	281 130	260 306	241 024	223 170	206 639	191 332	177 160	164 037	151 886	**42 019 941**	**913 477**
Water Wise Gardening			m3/annum	457 643	423 743	392 355	363 291	336 381	311 464	288 392	267 030	247 250	228 935	211 977	196 275	181 736	168 274	**46 553 891**	**1 012 041**
Meter reading, billing & cost recovery			m3/annum	1 039 304	962 319	891 036	825 033	763 920	707 333	654 938	606 424	561 504	519 911	481 399	445 740	412 722	382 150	**105 723 675**	**2 298 341**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	607 815	562 792	521 104	482 504	446 763	413 669	383 027	354 654	328 384	304 059	281 536	260 682	241 372	223 492	**61 830 292**	**1 344 137**
Total			**m3/annum**	**3 361 120**	**3 112 148**	**2 881 619**	**2 668 166**	**2 470 524**	**2 287 522**	**2 118 076**	**1 961 181**	**1 815 909**	**1 681 397**	**1 556 849**	**1 441 527**	**1 334 747**	**1 235 877**	**345 529 158**	**7 511 503**

Unit reference values																			
All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**4.3**	**4.3**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.9	0.9
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.8	4.8
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	7.8	7.8
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	6.6
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.7
Management				1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2.7	2.7
Awareness campaigns & Efficiency				13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	20.6	20.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

				Discount rate :	10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost				**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Sectorisation		CAPEX		Rands		808 044	734 585	667 805	607 095	551 905	501 732	456 120	414 654	376 958	342 689	311 536	141 607	128 734	117 031	106 392	96 720
		OPEX		Rands		808 044	734 585	667 805	607 095	551 905	501 732	456 120	414 654	376 958	342 689	311 536	283 214	257 468	234 061	212 783	193 439
Pressure management		CAPEX		Rands		0	1 818 182	1 652 893	1 502 630	1 366 027	1 241 843	1 128 948	1 026 316	933 015	848 195	771 087	0	0	0	0	0
		OPEX		Rands		2 008 044	1 825 494	1 659 540	1 508 673	1 371 521	1 246 837	1 133 488	1 030 444	936 767	851 607	774 188	703 807	639 825	581 659	528 781	480 710
Mains replacement		CAPEX		Rands		7 675 500	6 977 727	6 343 388	5 766 717	5 242 470	4 765 882	4 332 620	3 938 745	3 580 677	3 255 161	2 959 238	2 690 216	2 445 651	2 223 319	2 021 199	1 837 454
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		15 351 000	13 955 455	12 686 777	11 533 434	10 484 940	9 531 763	8 665 239	7 877 490	7 161 355	6 510 323	5 918 475	5 380 432	4 891 302	4 446 638	4 042 398	3 674 907
Retrofitting & removal of wasteful devices		CAPEX		Rands		0	3 672 926	3 339 023	3 035 476	2 759 523	2 508 658	2 280 598	2 073 271	1 884 792	1 713 447	1 557 679	0	0	0	0	0
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX		Rands		3 636 196	3 305 633	3 005 121	2 731 928	2 483 571	2 257 792	2 052 538	1 865 944	1 696 312	1 542 102	1 401 911	1 274 465	1 158 604	1 053 277	957 524	870 477
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		48 482 619	44 075 108	40 068 280	36 425 709	33 114 281	30 103 892	27 367 174	24 879 249	22 617 499	20 561 363	18 692 148	16 992 862	15 448 056	14 043 688	12 766 989	11 606 353
Water audits / manage KPI's		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		2 908 957	2 644 506	2 404 097	2 185 543	1 986 857	1 806 234	1 642 030	1 492 755	1 357 050	1 233 682	1 121 529	1 019 572	926 883	842 621	766 019	696 381
Management meters		CAPEX		Rands		0	2 272 727	2 066 116	1 878 287	1 707 534	1 552 303	1 411 185	1 282 895	1 166 268	1 060 244	963 858	0	0	0	0	0
		OPEX		Rands		641 609	583 281	530 255	482 050	438 227	398 389	362 171	329 247	299 315	272 105	247 368	224 880	204 436	185 851	168 956	153 596
Consumer meters		CAPEX		Rands		0	3 672 926	3 339 023	3 035 476	2 759 523	2 508 658	2 280 598	2 073 271	1 884 792	1 713 447	1 557 679	0	0	0	0	0
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX		Rands		0	41 626 491	37 842 264	34 402 058	31 274 599	28 431 453	25 846 776	23 497 069	21 360 972	19 419 065	17 653 696	0	0	0	0	0
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**				**12 119 740**	**64 081 197**	**58 255 633**	**52 959 667**	**48 145 151**	**43 768 320**	**39 789 381**	**36 172 165**	**32 883 786**	**29 894 351**	**27 176 683**	**4 106 288**	**3 732 989**	**3 393 626**	**3 085 115**	**2 804 650**
		OPEX				**70 200 272**	**63 818 429**	**58 016 753**	**52 742 503**	**47 947 730**	**43 588 846**	**39 626 223**	**36 023 839**	**32 748 945**	**29 771 768**	**27 065 244**	**24 604 767**	**22 367 970**	**20 334 518**	**18 485 926**	**16 805 387**
		TOTAL				**82 320 012**	**127 899 625**	**116 272 387**	**105 702 170**	**96 092 882**	**87 357 165**	**79 415 605**	**72 196 004**	**65 632 731**	**59 666 119**	**54 241 927**	**28 711 055**	**26 100 959**	**23 728 144**	**21 571 040**	**19 610 037**
		REDUCED PAYMENT				**1 497 644**	**8 793 680**	**14 750 786**	**19 552 108**	**23 358 554**	**26 311 332**	**28 534 195**	**30 135 452**	**31 209 752**	**31 839 671**	**31 519 721**	**28 654 292**	**26 049 357**	**23 681 233**	**21 528 394**	**19 571 267**
		ADDITIONAL INCOME				**0**	**6 653 673**	**12 097 587**	**16 496 710**	**19 996 012**	**22 722 741**	**24 788 444**	**26 290 774**	**27 315 090**	**27 935 888**	**28 218 068**	**25 652 789**	**23 320 718**	**21 200 652**	**19 273 320**	**17 521 200**
		CBR				**54.97**	**14.54**	**7.88**	**5.41**	**4.11**	**3.32**	**2.78**	**2.40**	**2.10**	**1.87**	**1.72**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

				10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving				**Unit**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Pressure management				m3/annum	0	445 961	810 838	1 105 688	1 340 228	1 522 986	1 661 440	1 762 133	1 830 788	1 872 396	1 891 309	1 719 372	1 563 066	1 420 969	1 291 790	1 174 354
Mains replacement				m3/annum	224 125	407 499	555 681	673 553	765 401	834 982	885 587	920 091	941 002	950 507	864 097	785 543	714 130	649 209	590 190	536 536
Active and passive leakage control				m3/annum	275 090	500 163	682 041	826 717	939 451	1 024 855	1 086 968	1 129 317	1 154 983	1 166 650	1 060 591	964 173	876 521	796 838	724 398	658 543
Retrofitting & removal of wasteful devices				m3/annum	0	440 751	801 366	1 092 771	1 324 571	1 505 195	1 642 030	1 741 547	1 809 400	1 850 523	1 869 215	1 699 286	1 544 806	1 404 369	1 276 699	1 160 635
Water Wise Gardening				m3/annum	0	488 308	887 833	1 210 681	1 467 492	1 667 605	1 819 205	1 929 460	2 004 634	2 050 194	2 070 903	1 882 639	1 711 490	1 555 900	1 414 455	1 285 868
Meter reading, billing & cost recovery				m3/annum	0	1 108 945	2 016 265	2 749 452	3 332 669	3 787 123	4 131 407	4 381 796	4 552 515	4 655 981	4 703 011	4 275 465	3 886 786	3 533 442	3 212 220	2 920 200
Water Use Efficiency				m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other				m3/annum	0	648 544	1 179 170	1 607 960	1 949 042	2 214 820	2 416 168	2 562 602	2 662 444	2 722 954	2 750 458	2 500 417	2 273 106	2 066 460	1 878 600	1 707 818
Total				**m3/annum**	**499 215**	**4 040 172**	**6 933 193**	**9 266 821**	**11 118 853**	**12 557 567**	**13 642 806**	**14 426 947**	**14 955 766**	**15 269 205**	**15 209 585**	**13 826 896**	**12 569 905**	**11 427 186**	**10 388 351**	**9 443 956**
Unit reference values																				
All interventions					**164.9**	**31.7**	**16.8**	**11.4**	**8.6**	**7.0**	**5.8**	**5.0**	**4.4**	**3.9**	**3.6**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management						8.2	4.1	2.7	2.0	1.6	1.4	1.2	1.0	0.9	0.8	0.4	0.4	0.4	0.4	0.4
Mains replacement					34.2	17.1	11.4	8.6	6.8	5.7	4.9	4.3	3.8	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC					55.8	27.9	18.6	14.0	11.2	9.3	8.0	7.0	6.2	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices						8.3	4.2	2.8	2.1	1.7	1.4	1.2	1.0	0.9	0.8	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening						85.2	42.6	28.4	21.3	17.0	14.2	12.2	10.7	9.5	8.5	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery						6.3	3.1	2.1	1.6	1.3	1.0	0.9	0.8	0.7	0.6	0.3	0.3	0.3	0.3	0.3
Management						21.5	10.7	7.2	5.4	4.3	3.6	3.1	2.7	2.4	2.1	1.3	1.3	1.3	1.3	1.3
Awareness campaigns & Efficiency						135.9	68.0	45.3	34.0	27.2	22.7	19.4	17.0	15.1	13.6	13.6	13.6	13.6	13.6	13.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

				Discount rate :	10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost				**Unit**		**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Sectorisation		CAPEX		Rands		87 927	79 934	72 667	66 061	60 055	54 596	49 632	45 120	41 019	37 290	33 900	30 818	28 016	25 469	23 154	21 049
		OPEX		Rands		175 854	159 867	145 334	132 122	120 111	109 191	99 265	90 241	82 037	74 579	67 799	61 636	56 032	50 939	46 308	42 098
Pressure management		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		437 009	397 281	361 164	328 331	298 483	271 348	246 680	224 255	203 868	185 334	168 486	153 169	139 244	126 586	115 078	104 616
Mains replacement		CAPEX		Rands		1 670 412	1 518 557	1 380 506	1 255 006	1 140 914	1 037 195	942 904	857 186	779 260	708 418	644 016	585 469	532 245	483 859	439 872	399 883
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		3 340 825	3 037 114	2 761 012	2 510 011	2 281 828	2 074 389	1 885 809	1 714 371	1 558 519	1 416 836	1 288 033	1 170 939	1 064 490	967 718	879 744	799 767
Retrofitting & removal of wasteful devices		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX		Rands		791 342	719 402	654 002	594 547	540 497	491 361	446 692	406 084	369 167	335 606	305 097	277 361	252 146	229 224	208 385	189 441
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		10 551 230	9 592 028	8 720 025	7 927 296	7 206 632	6 551 484	5 955 894	5 414 450	4 922 227	4 474 752	4 067 956	3 698 142	3 361 947	3 056 316	2 778 469	2 525 881
Water audits / manage KPI's		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		633 074	575 522	523 202	475 638	432 398	393 089	357 354	324 867	295 334	268 485	244 077	221 889	201 717	183 379	166 708	151 553
Management meters		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		139 633	126 939	115 399	104 908	95 371	86 701	78 819	71 654	65 140	59 218	53 834	48 940	44 491	40 447	36 770	33 427
Consumer meters		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**				**2 549 682**	**2 317 892**	**2 107 175**	**1 915 614**	**1 741 467**	**1 583 152**	**1 439 229**	**1 308 390**	**1 189 445**	**1 081 314**	**983 013**	**893 648**	**812 407**	**738 552**	**671 411**	**610 374**
		OPEX				**15 277 624**	**13 888 750**	**12 626 136**	**11 478 305**	**10 434 823**	**9 486 203**	**8 623 821**	**7 839 837**	**7 127 125**	**6 479 204**	**5 890 186**	**5 354 714**	**4 867 922**	**4 425 384**	**4 023 076**	**3 657 342**
		TOTAL				**17 827 306**	**16 206 642**	**14 733 311**	**13 393 919**	**12 176 290**	**11 069 354**	**10 063 050**	**9 148 227**	**8 316 570**	**7 560 518**	**6 873 198**	**6 248 362**	**5 680 329**	**5 163 936**	**4 694 487**	**4 267 715**
		REDUCED PAYMENT				**17 792 061**	**16 174 601**	**14 704 183**	**13 367 439**	**12 152 217**	**11 047 470**	**10 043 155**	**9 130 141**	**8 300 128**	**7 545 571**	**6 859 610**	**6 236 009**	**5 669 099**	**5 153 726**	**4 685 206**	**4 259 278**
		ADDITIONAL INCOME				**15 928 364**	**14 480 331**	**13 163 937**	**11 967 216**	**10 879 287**	**9 890 261**	**8 991 146**	**8 173 769**	**7 430 699**	**6 755 181**	**6 141 074**	**5 582 794**	**5 075 268**	**4 613 880**	**4 194 436**	**3 813 124**
		CBR				**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

					10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving				**Unit**		**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Pressure management				m3/annum		1 067 595	970 541	882 310	802 100	729 182	662 892	602 629	547 845	498 041	452 764	411 604	374 185	340 169	309 244	281 131	255 574
Mains replacement				m3/annum		487 760	443 419	403 108	366 462	333 147	302 861	275 328	250 298	227 544	206 858	188 053	170 957	155 416	141 287	128 443	116 766
Active and passive leakage control				m3/annum		598 676	544 251	494 773	449 794	408 904	371 731	337 937	307 215	279 287	253 897	230 815	209 832	190 757	173 415	157 650	143 318
Retrofitting & removal of wasteful devices				m3/annum		1 055 123	959 203	872 003	792 730	720 663	655 148	595 589	541 445	492 223	447 475	406 796	369 814	336 195	305 632	277 847	252 588
Water Wise Gardening				m3/annum		1 168 971	1 062 701	966 092	878 265	798 423	725 839	659 854	599 867	545 333	495 758	450 689	409 717	372 470	338 609	307 827	279 842
Meter reading, billing & cost recovery				m3/annum		2 654 727	2 413 388	2 193 990	1 994 536	1 813 214	1 648 377	1 498 524	1 362 295	1 238 450	1 125 864	1 023 512	930 466	845 878	768 980	699 073	635 521
Water Use Efficiency				m3/annum		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other				m3/annum		1 552 562	1 411 420	1 283 109	1 166 463	1 060 421	964 019	876 381	796 710	724 282	658 438	598 580	544 164	494 694	449 722	408 838	371 671
Total				**m3/annum**		**8 585 414**	**7 804 922**	**7 095 384**	**6 450 349**	**5 863 954**	**5 330 867**	**4 846 243**	**4 405 675**	**4 005 159**	**3 641 054**	**3 310 049**	**3 009 135**	**2 735 578**	**2 486 889**	**2 260 808**	**2 055 280**
Unit reference values																					
All interventions						**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Pressure management						0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Mains replacement						3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC						5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Retrofitting & removal of wasteful devices						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery						0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Management						1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Awareness campaigns & Efficiency						13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

eThekwini Metropolitan Municipality

Unit Reference Value (URV) Calculations

Discount rate : 10%

Net present cost			Unit	32 2038-39	33 2039-40	34 2040-41	35 2041-42	36 2042-43	37 2043-44	38 2044-45	39 2045-46	40 2046-47	41 2047-48	42 2048-49	43 2049-50	44 2050-51	45 2051-52	Total	Average
Sectorisation		CAPEX	Rands	19 135	17 396	15 814	14 377	13 070	11 882	10 801	9 820	8 927	8 115	7 378	6 707	6 097	5 543	7 275 372	158 160
		OPEX	Rands	38 271	34 792	31 629	28 754	26 140	23 763	21 603	19 639	17 854	16 231	14 755	13 414	12 194	11 086	8 777 623	190 818
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12 289 134	267 155
		OPEX	Rands	95 106	86 460	78 600	71 454	64 959	59 053	53 685	48 804	44 368	40 334	36 667	33 334	30 304	27 549	21 812 992	474 195
Mains replacement		CAPEX	Rands	363 530	330 482	300 438	273 126	248 296	225 724	205 203	186 549	169 590	154 172	140 157	127 415	115 832	105 302	83 377 482	1 812 554
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	727 061	660 964	600 877	546 252	496 592	451 448	410 407	373 097	339 179	308 345	280 313	254 830	231 664	210 604	166 754 964	3 625 108
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24 825 392	539 682
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	172 219	156 563	142 330	129 391	117 628	106 935	97 213	88 376	80 341	73 038	66 398	60 362	54 874	49 886	39 499 303	858 680
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 296 255	2 087 505	1 897 732	1 725 210	1 568 373	1 425 794	1 296 176	1 178 342	1 071 220	973 836	885 306	804 823	731 658	665 143	526 657 371	11 449 073
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	137 775	125 250	113 864	103 513	94 102	85 548	77 771	70 701	64 273	58 430	53 118	48 289	43 899	39 909	31 599 442	686 944
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15 361 418	333 944
		OPEX	Rands	30 388	27 626	25 114	22 831	20 756	18 869	17 153	15 594	14 176	12 888	11 716	10 651	9 683	8 802	6 969 672	151 515
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24 825 392	539 682
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	281 354 442	6 116 401
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**554 885**	**504 441**	**458 583**	**416 893**	**378 994**	**344 540**	**313 218**	**284 744**	**258 858**	**235 325**	**213 932**	**194 484**	**176 803**	**160 730**	**488 807 935**	**10 626 259**
		OPEX		**3 324 856**	**3 022 597**	**2 747 815**	**2 498 014**	**2 270 922**	**2 064 474**	**1 876 795**	**1 706 177**	**1 551 070**	**1 410 064**	**1 281 876**	**1 165 342**	**1 059 402**	**963 092**	**762 572 065**	**16 577 654**
		TOTAL		**3 879 741**	**3 527 037**	**3 206 398**	**2 914 907**	**2 649 915**	**2 409 014**	**2 190 013**	**1 990 921**	**1 809 928**	**1 645 389**	**1 495 808**	**1 359 826**	**1 236 205**	**1 123 823**	**1 251 380 000**	**27 203 913**
		REDUCED PAYMENT		**3 872 071**	**3 520 064**	**3 200 059**	**2 909 144**	**2 644 676**	**2 404 251**	**2 185 683**	**1 986 985**	**1 806 350**	**1 642 136**	**1 492 851**	**1 357 137**	**1 233 761**	**1 121 601**	**551 484 100**	**11 988 785**
		ADDITIONAL INCOME		**3 466 476**	**3 151 342**	**2 864 856**	**2 604 415**	**2 367 650**	**2 152 409**	**1 956 735**	**1 778 850**	**1 617 137**	**1 470 124**	**1 336 477**	**1 214 979**	**1 104 526**	**1 004 115**	**484 654 525**	**10 535 968**
		CBR		**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**2.27**	**2.27**

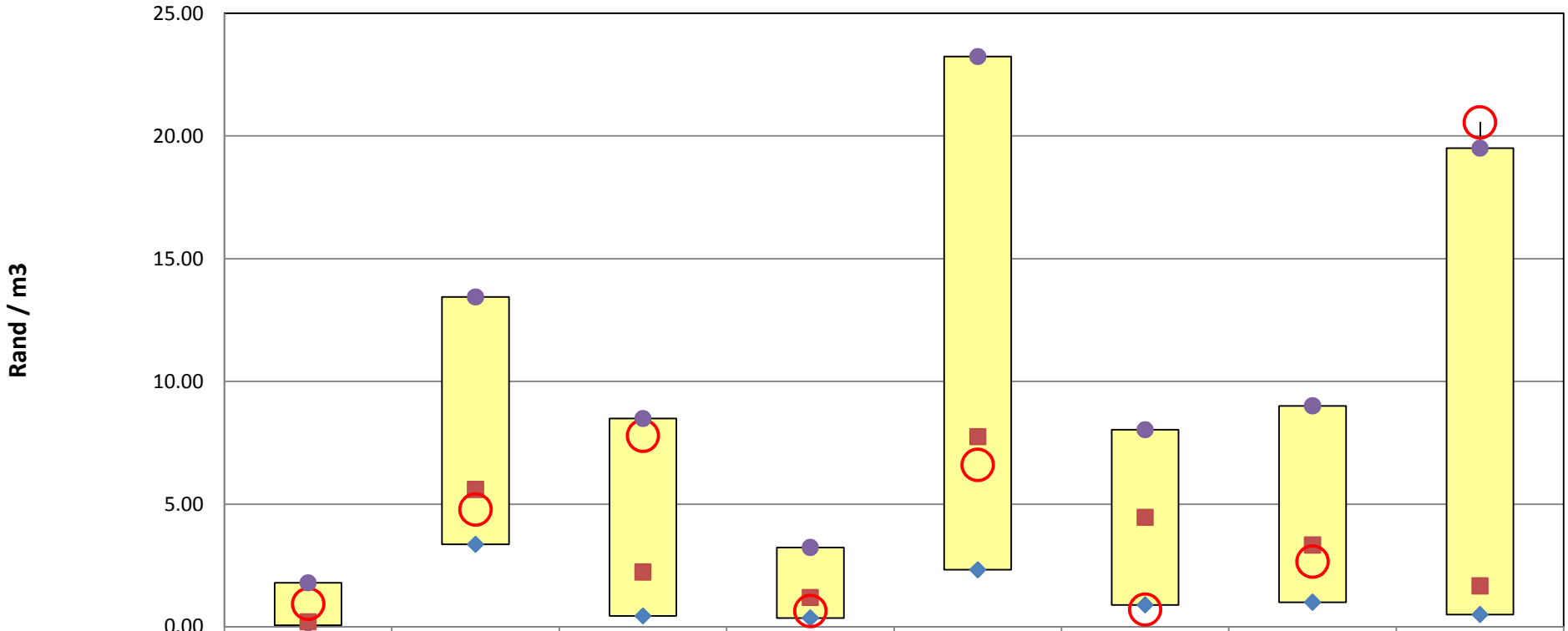
10%

Net present saving			Unit	32 2038-39	33 2039-40	34 2040-41	35 2041-42	36 2042-43	37 2043-44	38 2044-45	39 2045-46	40 2046-47	41 2047-48	42 2048-49	43 2049-50	44 2050-51	45 2051-52	Total	Average
Pressure management			m3/annum	232 340	211 218	192 016	174 560	158 691	144 265	131 150	119 227	108 388	98 535	89 577	81 434	74 031	67 301	**32 483 856**	**706 171**
Mains replacement			m3/annum	106 151	96 501	87 728	79 753	72 502	65 911	59 919	54 472	49 520	45 018	40 926	37 205	33 823	30 748	**16 356 017**	**355 566**
Active and passive leakage control			m3/annum	130 289	118 445	107 677	97 888	88 989	80 899	73 545	66 859	60 781	55 255	50 232	45 666	41 514	37 740	**20 075 331**	**436 420**
Retrofitting & removal of wasteful devices			m3/annum	229 626	208 750	189 773	172 521	156 837	142 579	129 618	117 834	107 122	97 384	88 531	80 482	73 166	66 514	**32 104 374**	**697 921**
Water Wise Gardening			m3/annum	254 402	231 275	210 250	191 136	173 760	157 964	143 603	130 549	118 680	107 891	98 083	89 166	81 060	73 691	**35 568 435**	**773 227**
Meter reading, billing & cost recovery			m3/annum	577 746	525 224	477 476	434 069	394 608	358 735	326 123	296 475	269 523	245 021	222 746	202 496	184 088	167 352	**80 775 754**	**1 755 995**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	337 883	307 166	279 242	253 856	230 778	209 799	190 726	173 387	157 625	143 295	130 268	118 426	107 660	97 873	**47 240 020**	**1 026 957**
Total			**m3/annum**	**1 868 436**	**1 698 578**	**1 544 162**	**1 403 784**	**1 276 167**	**1 160 152**	**1 054 684**	**958 803**	**871 639**	**792 399**	**720 363**	**654 876**	**595 341**	**541 219**	**264 603 787**	**5 752 256**

Unit reference values

All interventions				**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**4.7**	**4.7**
Pressure management				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.0	1.0
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	5.1	5.1
ALC & PLC				5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	8.3	8.3
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	7.9
Meter reading, billing & cost recovery				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.8	0.8
Management				1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	3.0	3.0
Awareness campaigns & Efficiency				13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	22.3	22.3

KZN METRO WC/WDM POTENTIAL ASSESSMENT
eThekwini Metro Unit Reference Values - Scenario 3



	Pressure management	Mains replacement	Leak detection & repair	Retrofitting	Water Wise	Metering and billing	Management	Awareness campaigns
Ideal conditions	0.06	3.36	0.44	0.36	2.32	0.89	1.00	0.50
Expected conditions	0.21	5.60	2.23	1.20	7.74	4.46	3.33	1.67
eThekwini	0.93	4.78	7.79	0.65	6.60	0.71	2.66	20.56
Poor conditions	1.79	13.43	8.49	3.23	23.23	8.03	9.00	19.50

Appendix B: Msunduzi Municipality

WC/WDM Scorecard

Scenario 1 – 5 year water loss without efficiency

Scenario 2 – 5 year water loss and efficiency

Scenario 3 – 10 year water loss and efficiency

Municipal Scorecard for Assessing the Potential for WC/WDM Efforts in Municipalities

Name of Municipality / Water Service Provider: Mzunduzi Local Municipality

Assessment Date: 15-Jun-07

Item No.	Description	Max Points	Score	Comments
1	Development of a standard water balance	20	10	Reliable water balance with UAW > 30%
2	Pressurised water supply to all customers 100% of the time	20	20	No Problems
3	Residential Consumer Meter Reading	20	10	Meter reading and illegal connection problems rife
4	Commercial and Industrial Meter Reading	20	15	Meters in place but audit required
5	Efficient Leakage Reporting System	20	15	Toll free 24hr Number
6	Planned Maintenance of all infrastructure - based on % of network value per annum	20	5	Lack of investment for planned maintenance
7	Effective WC/WDM Section in Place	20	15	Good section but additional technical staff and training is required
8	Sectorisation of reticulation system in place	20	15	Logging of flows and pressures required
9	Control and Boundary Valve Maintenance Programme	10	5	Done on an ad-hoc basis
10	Efficient bulk management metering system in place	10	7.5	Sufficient bulk metering in place no check meters
11	Efficient Zone management metering system in place	10	7.5	Some meters may need to be repaired / replaced
12	As built drawings of all bulk and reticulation infrastructure	10	5	Good scope for improvement
13	Pressure management	10	7.5	Been don - not well maintained
14	Asset Register	10	5	Poor asset register in place requires improvement
15	Active Leakage Control	10	5	Local teams investigate high consumption areas for leaks
16	Community Awareness and Education Programmes related to Water Conservation	10	5	Would like to develop this within the municipality
17	School Awareness and Education Programmes related to Water Conservation	10	2.5	Would like to develop this within the municipality
18	Informative Billing / Itemised Billing	10	5	Scope for improving the look of the water bill
19	Newspaper / Radio WDM Education in Place	10	2.5	Scope to make better use of local press and radio station
20	WDM Posters and leaflets for distribution in various languages	10	2.5	Require more posters and leaflets
	Total	**280**	**165**	

Potential WC/WDM Interventions Requested by the Municipality / WSA

Require support establishing a PR / Customer Care department

Require Additional Technical staff to carry out WC/WDM functions within the municipality and require training for this staff

Municipality has a large volume of Unmetered residential consumption this needs to be addressed - require an intervention to deal with meter reading and developing a culture of payment for services. Currently meter readers are accosted by local residents

MZ would like to have an audit done of their Industrial consumers

More funding is required for maintenance of existing infrastructure

Control and boundary valves are not being maintained sufficiently - Require project to revisit PRV zones analyse and re-set PRV's and re-establish zones

MZ require a GIS programme to digitise all their drawings and prepare a hydraulic model of the network

There is scope for improved active leak detection

Municipal Scorecard for Assessing the Potential for WC/WDM Efforts in Municipalities

General

Name of Municipality	**Mzunduzi Municipality**
Municipal staff	**Yunus Goga, Levon**

Breakdown of Items

1. Development of a standard water balance (20 Points)

WSA has developed reliable water balance and results indicate no problems with UAW at less than 20%	20
WSA has developed reliable water balance and results indicate no problems with UAW at less than 30%	15
WSA has developed reliable water balance and results indicate no problems with UAW greater than 30%	~~10~~
WSA has no water balance and no obvious leakage problem	5
WSA has no water balance and has an obvious leakage problem	0

2. Pressurised water supply to all customers 100% of the time (20 Points)

WSA maintains a pressurised supply to all areas within the water distribution network all of the time at a minimum of 20m pressure	~~20~~
WSA maintains a pressurised supply to all areas within the water distribution network however pressure drops below 20m in certain areas	15
Small isolated sections of the network experience intermittent supply	10
Many sections of the network experience intermittent supply	5
The entire network experiences intermittent supply	0

3. Residential Consumer Meter Reading (20 Points)

All consumers are metered and billed monthly	20
More than 75% of consumers are metered and billed monthly	15
50 - 75% of consumers are metered and billed monthly	~~10~~
Less than 50% of consumers are metered and billed monthly	5
No meter reading or billing takes place	0

4. Commercial and Industrial Meter Reading (20 Points)

All connections to Industrial and Commercial consumers including fire supply connections are metered and accurate.	20
All connections to Industrial and Commercial consumers including fire supply connections are metered, however some meters are not functioning or inaccurate.	~~15~~
All connections to Industrial and Commercial consumers excluding fire supply connections are metered, however many meters are not functioning or inaccurate.	10
Some industrial and commercial metering takes place, however many connections are not metered and many meters are not functioning or inaccurate	5
No Industrial / Commercial metering takes place	0

5. Efficient Leakage Reporting System (20 Points)

Efficient and reactive leakage reporting system in place (telephone number is well advertised, reported leaks are dealt with within 24hr's)	20
Efficient and reactive leakage reporting system in place (telephone number is well advertised, reported leaks are dealt with within 48hr's)	~~15~~
leakage reporting system in place response times need to be improved	10
leakage reporting system in no response units in place	5
No leakage reporting system in place and no plans to create a leakage reporting system.	0

6. Planned Maintenance of all infrastructure - based on % of network value per annum (20 Points)

2% or more of the value of the water network is invested annually into the maintenance of the infrastructure	20
1.5% - 2% of the value of the water network is invested annually into the maintenance of the infrastructure	15
1.0% - 1.5% of the value of the water network is invested annually into the maintenance of the infrastructure	10
0.5% - 1.0% of the value of the water network is invested annually into the maintenance of the infrastructure	~~5~~
0% - 0.5% of the value of the water network is invested annually into the maintenance of the infrastructure	0

7. Effective WC/WDM Section in Place (20 Points)

Efficient WDM Section in place	20
WDM section requires some capacity building and training	~~15~~
Inefficient WDM section in place	10
No WDM section currently in place, intention to create WDM section	5
No WDM Section and no intention to create WDM section	0

8. Sectorisation of reticulation system in place (20 Points)

Reticulation is comprehensively sectorised into pressure zones which are all discrete. Flows and pressures in each are monitored monthly	20
Reticulation is comprehensively sectorised into pressure zones which are all discrete. Flows and pressures in each are not monitored	15
Reticulation is sectorised in theory, however, zone discreteness needs to be verified and confirmed	10
Plans exist indicating designed pressure zones, however these are no longer in place practically	5
No Discrete pressure zones or drawings indicating the proposed pressure zones exist	0

9. Control and Boundary Valve Maintenance Programme (10 Points)

All control valves and boundary valves are visited bi-annually to verify correct operation and serviced at least every five years.	10
All control valves and boundary valves are visited annually to verify correct operation and serviced when operation fails	7.5
Control valves and boundary valves are visited and serviced on and ad-hoc basis	5
Control valves and boundary valves are seldom visited	2.5
Control valves and boundary valves are never visited or serviced	0

10. Efficient bulk management metering system in place (10 Points)

All bulk inlets to the WSA are accurately metered by the WSA. (i.e. check meters are in place)	10
All bulk inlets to the WSA are metered by the Bulk water supplier or by the WSA	7.5
Few bulk meters are operational	5
No Bulk metering in place however a proposal to install bulk metering	2.5
No Bulk metering in place and no plans for any	0

11. Efficient Zone management metering system in place (10 Points)

All inlet points to discrete zones are metered and accurate	10
All inlet points to discrete zones are metered some meters are not functioning or are inaccurate	7.5
All inlet points to discrete zones are metered. Majority meters are not functioning or are inaccurate	5
Zone inputs are currently not metered. The WSA intends creating District Metered Areas (DMA's) / Zones and installing zone meters.	2.5
No accurate Zone metering in place and not intention of installing zone metering	0

12. As built drawings of all bulk and reticulation infrastructure (10 Points)

Accurate as-built drawings for all reticulation available digitally	10

As-build drawings available digitally for the majority of the network. as-built drawings available in hard copy for the remainder of the network	7.5
A mixture of digital and hard copy as-built drawings available for the majority of the network.	5
Hard copy as-built drawings available for portions of the network	2.5
No as-built drawings available	0

13. Pressure management (10 Points)

Comprehensive pressure management studies have been conducted, implemented and are being maintained within the municipality	10
Some pressure management studies have been conducted, implemented in certain areas within the municipality. Maintenance of these installations can be improved	7.5
Pressure management studies have been conducted but as yet have not been implemented or there is no scope for pressure management	5
No pressure management studies have been conducted however reservoir, tower and direct supply zones are kept discrete.	2.5
Pressure management has never been investigated or implemented within the municipality	0

14. Asset Register (10 Points)

WSA has a comprehensive and accurate asset register in place which is available digitally	10
WSA has a reasonably comprehensive and accurate asset register in place in hard copy	7.5
WSA has a poor asset register	5
WSA is in the process of developing an asset register	2.5
WSA has no asset register in place and no immediate intention of generating an asset register	0

15. Active Leakage Control (10 Points)

Active leakage detection undertaken continuously with efficient response to leaks detected	10
Active leakage detection undertaken continuously, response to leaks detected can be improved	7.5
Active leakage detection is done, usually by external consultants / contractors, Leaks reported are documented and repaired when staff are available	5
No active leakage detection is currently done however the WAS intends to conduct active leakage detection exercises	2.5
No active leakage detection is done and no intention to conduct active leakage detection	0

16. Community Awareness and Education Programmes related to Water Conservation (10 Points)

WSA is actively involved in conducting workshops on water conservation within the communities with a dedicated team	10
WSA is involved in conducting workshops on water conservation within the communities however no dedicated team exists	7.5
WSA has very little involvement with workshops on water conservation within the communities	5

WSA currently does not conduct workshops on water conservation within the communities, however these interventions are proposed	2.5
WSA currently does not conduct workshops on water conservation within the communities	0

17. School Awareness and Education Programmes related to Water Conservation (10 Points)

WSA is actively involved in conducting workshops on water conservation within the schools with a dedicated team	10
WSA is involved in conducting workshops on water conservation within the schools however no dedicated team exists	7.5
WSA has very little involvement with workshops on water conservation within the schools	5
WSA currently does not conduct workshops on water conservation within the schools, however these interventions are proposed	2.5
WSA currently does not conduct workshops on water conservation within the schools	0

18. Informative Billing / Itemised Billing (10 Points)

WSA produces informative, itemised billing. Indicating the water tariff structure and itemises the volumes of water consumed under each tariff	10
WSA itemises total consumption and free basic water only and indicate the water tariff structure on the bill	7.5
WSA itemises total consumption and free basic water only	5
WSA presently does not have itemised billing but intends developing an itemised billing	2.5
WSA has no informative or itemised billing	0

19. Newspaper / Radio WDM Education in Place (10 Points)

WSA regularly (at least once a month) runs programmes on the local Radio and has advertisements in the local press promoting Water Conservation	10
WSA runs programmes on the local Radio and has advertisements in the local press promoting Water Conservation every 1 - 6 months	7.5
WSA occasionally (at least once a year) makes use of local radio **or** has advertisements in the local press promoting water conservation	5
WSA seldom (less than once a year) makes use of local radio **or** has advertisements in the local press promoting water conservation	2.5
WSA does not make use of Radio or the local press to promote the importance of Water conservation at all	0

20. WDM Posters and leaflets for distribution in various languages (10 Points)

WSA has an extensive library of educational posters and leaflets dealing with water conservation issues in at least three languages	10
WSA has a library of educational posters and leaflets dealing with water conservation issues in at least two languages	7.5
WSA has a library of educational posters and leaflets dealing with water conservation issues in only one language	5
WSA has no educational posters or leaflets but intends producing these	2.5
WSA has no educational posters or leaflets and has no intention of producing these	0

Comments / Interventions proposed by the WSA / Municipality

Mzunduzi require a PR / Customer Care depatrment and training for this staff

Mzunduzt Require technicians to join the WDM section and require training fo this staff

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality			Unit	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**
Billed consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232
Unbilled potential paid consumption	% of system input volume	10.0%	m3/annum	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851
Total potential revenue water		67%	**m3/annum**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**
Non-revenue water			**m3/annum**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**
Unbilled consumption	% of system input volume	1%	m3/annum	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282
Apparent losses		20%	m3/annum	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061
Unavoidable annual real losses		2.0	m3/annum	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Potential saving (Real losses)			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**
Target Sysem Input Volume			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**
% return flow			m3/annum	0%	50%	55%	60%	65%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Return flow			m3/annum	0	20 645 370	22 709 907	24 774 444	26 838 981	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	30%	m3/annum	0	254 566	509 131	763 697	1 018 263	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829
Mains replacement	Replace _% per annum, Saving 200l/km/h	10%	m3/annum	102 317	204 634	306 950	409 267	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	125 583	251 167	376 750	502 333	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	20	m3/annum	0	893 900	1 787 801	2 681 701	3 575 602	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502
Water wise gardening	Reduce billed consumption by _% for 1/3	10%	m3/annum	0	185 862	371 723	557 585	743 446	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308
Total direct interventions			**m3/annum**	**227 900**	**1 790 128**	**3 352 356**	**4 914 584**	**6 476 812**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**
Indirect measureable interventions																			
Sectorisation																			
Tariff structures																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	0.0%	1.0%	2.0%	2.9%	3.9%	4.4%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%
Other Interventions			**m3/annum**	**0**	**505 266**	**1 010 532**	**1 515 798**	**2 021 063**	**2 273 696**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**
Total estimated savings			**m3/annum**	**227 900**	**2 295 394**	**4 362 888**	**6 430 381**	**8 497 875**	**10 084 836**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**
System Input Volume with WCWDM			**m3/annum**	**51 400 308**	**49 332 814**	**47 265 320**	**45 197 827**	**43 130 333**	**41 543 372**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**
% Reduction			**%**	**0%**	**4%**	**8%**	**12%**	**16%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**
Meter reading, billing & cost recovery			**m3/annum**	**0**	**1 032 564**	**2 065 128**	**3 097 692**	**4 130 257**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**
Water Use Efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000
		OPEX	Rands	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000
Pressure management		CAPEX	Rands		1 000 000	1 000 000	1 000 000	1 000 000	1 000 000										
		OPEX	Rands	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
		OPEX	Rands	0															
Active and passive leakage control		CAPEX	Rands	0															
	R 1500 / km	OPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands		3 724 585	3 724 585	3 724 585	3 724 585	3 724 585										
		OPEX	Rands	0															
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0															
	R 5 / consumer / month	OPEX	Rands	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878
Water audits / manage KPI's		CAPEX	Rands	0															
	R 1500 / zone / month	OPEX	Rands	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands		200 000	200 000	200 000	200 000	200 000										
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands		3 724 585	3 724 585	3 724 585	3 724 585	3 724 585										
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening	R 2000 per customer	CAPEX	Rands		9 311 463	9 311 463	9 311 463	9 311 463	9 311 463										
		OPEX	Rands	0															
TOTAL COSTS		**CAPEX**	Rands	**2 274 294**	**20 234 927**	**20 234 927**	**20 234 927**	**20 234 927**	**20 234 927**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**
		OPEX	Rands	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**
		TOTAL	Rands	**10 313 172**	**28 273 805**	**28 273 805**	**28 273 805**	**28 273 805**	**28 273 805**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**
		REDUCED PAYMENT		**683 700**	**6 886 182**	**13 088 663**	**19 291 144**	**25 493 625**	**30 254 507**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**
		ADDITIONAL INCOME		**6 195 385**	**12 390 770**	**18 586 155**	**24 781 540**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**
		CBR		**15.08**	**4.11**	**2.16**	**1.47**	**1.11**	**0.93**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality			Unit	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**
Billed consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232
Unbilled potential paid consumption	% of system input volume	10.0%	m3/annum	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851
Total potential revenue water		67%	**m3/annum**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**
Non-revenue water			**m3/annum**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**
Unbilled consumption	% of system input volume	1%	m3/annum	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282
Apparent losses		20%	m3/annum	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061
Unavoidable annual real losses		2.0	m3/annum	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Potential saving (Real losses)			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**
Target Sysem Input Volume			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**
% return flow			m3/annum	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Return flow			m3/annum	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	30%	m3/annum	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829
Mains replacement	Replace _% per annum, Saving 200l/km/h	10%	m3/annum	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	20	m3/annum	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502
Water wise gardening	Reduce billed consumption by _% for 1/3	10%	m3/annum	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308
Total direct interventions			**m3/annum**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**
Indirect measureable interventions																			
Sectorisation																			
Tariff structures																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%
Other Interventions			**m3/annum**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**
Total estimated savings			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**
System Input Volume with WCWDM			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**
Meter reading, billing & cost recovery			**m3/annum**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**
Water Use Efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000
		OPEX	Rands	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000
Pressure management		CAPEX	Rands																
		OPEX	Rands	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands																
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands																
	R 5 / consumer / month	OPEX	Rands	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening	R 2000 per customer	CAPEX	Rands																
		OPEX	Rands																
TOTAL COSTS		**CAPEX**	Rands	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**
		OPEX	Rands	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**
		TOTAL	Rands	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**
		REDUCED PAYMENT		**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**
		ADDITIONAL INCOME		**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**
		CBR		**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
System input volume without WCWDM			**m3/annum**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**2 374 897 568**	**51 628 208**
Billed consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	1 282 444 687	27 879 232
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	1 282 444 687	27 879 232
Unbilled potential paid consumption	% of system input volume	10.0%	m3/annum	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	237 489 757	5 162 821
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	61 679 129	1 340 851
Total potential revenue water		67%	**m3/annum**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**1 581 613 572**	**34 382 904**
Non-revenue water			**m3/annum**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**793 283 996**	**17 245 304**
Unbilled consumption	% of system input volume	1%	m3/annum	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	23 748 976	516 282
Apparent losses		20%	m3/annum	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	158 656 799	3 449 061
Unavoidable annual real losses		2.0	m3/annum	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	135 354 667	2 942 493
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
Potential saving (Real losses)			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**475 523 554**	**10 337 469**
Target Sysem Input Volume			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**1 899 374 014**	**41 290 739**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**
% return flow			m3/annum	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	54%	54%
Return flow			m3/annum	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	1 280 012 922	27 826 368
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	30%	m3/annum	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	54 731 632	1 189 818
Mains replacement	Replace _% per annum, Saving 200l/km/h	10%	m3/annum	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	22 509 696	489 341
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	27 628 339	600 616
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	20	m3/annum	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	192 188 589	4 178 013
Water wise gardening	Reduce billed consumption by _% for 1/3	10%	m3/annum	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	39 960 233	868 701
Total direct interventions			**m3/annum**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**337 018 490**	**7 326 489**
Indirect measureable interventions																			
Sectorisation																			
Tariff structures																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.6%	4.6%
Other Interventions			**m3/annum**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**108 379 527**	**2 356 077**
Total estimated savings			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**445 398 016**	**9 682 566**
System Input Volume with WCWDM			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**1 929 499 552**	**41 945 642**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**19%**	**19%**
Meter reading, billing & cost recovery			**m3/annum**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**222 001 294**	**4 826 115**
Water Use Efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	**3 680 000**	**80 000**
		OPEX	Rands	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	**4 600 000**	**100 000**
Pressure management		CAPEX	Rands															**5 000 000**	**1 000 000**
		OPEX	Rands	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	**9 200 000**	**200 000**
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	**80 592 000**	**1 752 000**
		OPEX	Rands															**0**	**0**
Active and passive leakage control		CAPEX	Rands															**0**	**0**
	R 1500 / km	OPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	**80 592 000**	**1 752 000**
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands															**18 622 925**	**3 724 585**
		OPEX	Rands															**0**	**0**
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	**20 345 546**	**442 294**
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Education and awareness campaigns		CAPEX	Rands															**0**	**0**
	R 5 / consumer / month	OPEX	Rands	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	**256 996 370**	**5 586 878**
Water audits / manage KPI's		CAPEX	Rands															**0**	**0**
	R 1500 / zone / month	OPEX	Rands	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	**16 560 000**	**360 000**
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands															**1 000 000**	**200 000**
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	**1 840 000**	**40 000**
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands															**18 622 925**	**3 724 585**
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Water Wise Gardening	R 2000 per customer	CAPEX	Rands															**46 557 313**	**9 311 463**
		OPEX	Rands															**0**	**0**
TOTAL COSTS		**CAPEX**	Rands	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**194 420 710**	**4 226 537**
		OPEX	Rands	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**369 788 370**	**8 038 878**
		TOTAL	Rands	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**564 209 079**	**12 265 415**
		REDUCED PAYMENT		**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**1 336 194 048**	**29 047 697**
		ADDITIONAL INCOME		**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**1 362 984 691**	**29 630 102**
		CBR		**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.42**	**0.42**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			6%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Sectorisation		CAPEX	Rands	80 000	75 472	71 200	67 170	63 367	59 781	56 397	53 205	50 193	47 352	44 672	42 143	39 758	37 507	35 384	33 381
		OPEX	Rands	100 000	94 340	89 000	83 962	79 209	74 726	70 496	66 506	62 741	59 190	55 839	52 679	49 697	46 884	44 230	41 727
Pressure management		CAPEX	Rands	0	943 396	889 996	839 619	792 094	747 258	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	200 000	188 679	177 999	167 924	158 419	149 452	140 992	133 011	125 482	118 380	111 679	105 358	99 394	93 768	88 460	83 453
Mains replacement		CAPEX	Rands	1 752 000	1 652 830	1 559 274	1 471 013	1 387 748	1 309 196	1 235 091	1 165 180	1 099 226	1 037 006	978 308	922 932	870 690	821 406	774 911	731 048
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 752 000	1 652 830	1 559 274	1 471 013	1 387 748	1 309 196	1 235 091	1 165 180	1 099 226	1 037 006	978 308	922 932	870 690	821 406	774 911	731 048
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	3 513 759	3 314 867	3 127 233	2 950 220	2 783 227	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	442 294	417 259	393 641	371 359	350 339	330 508	311 800	294 151	277 501	261 793	246 975	232 995	219 807	207 365	195 627	184 554
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	5 586 878	5 270 639	4 972 301	4 690 850	4 425 330	4 174 840	3 938 528	3 715 593	3 505 276	3 306 864	3 119 683	2 943 097	2 776 507	2 619 346	2 471 081	2 331 209
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	360 000	339 623	320 399	302 263	285 154	269 013	253 786	239 421	225 868	213 083	201 022	189 644	178 909	168 782	159 228	150 215
Management meters		CAPEX	Rands	0	188 679	177 999	167 924	158 419	149 452	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	40 000	37 736	35 600	33 585	31 684	29 890	28 198	26 602	25 096	23 676	22 336	21 072	19 879	18 754	17 692	16 691
Consumer meters		CAPEX	Rands	0	3 513 759	3 314 867	3 127 233	2 950 220	2 783 227	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	8 784 399	8 287 169	7 818 084	7 375 551	6 958 067	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**2 274 294**	**19 089 554**	**18 009 013**	**16 989 635**	**16 027 958**	**15 120 715**	**1 603 288**	**1 512 536**	**1 426 920**	**1 346 151**	**1 269 954**	**1 198 070**	**1 130 255**	**1 066 278**	**1 005 923**	**948 984**
		OPEX		**8 038 878**	**7 583 847**	**7 154 572**	**6 749 597**	**6 367 544**	**6 007 117**	**5 667 091**	**5 346 313**	**5 043 691**	**4 758 199**	**4 488 867**	**4 234 780**	**3 995 076**	**3 768 940**	**3 555 603**	**3 354 343**
		TOTAL		**10 313 172**	**26 673 401**	**25 163 586**	**23 739 232**	**22 395 502**	**21 127 832**	**7 270 379**	**6 858 848**	**6 470 612**	**6 104 351**	**5 758 821**	**5 432 850**	**5 125 331**	**4 835 218**	**4 561 526**	**4 303 326**
		REDUCED PAYMENT		**683 700**	**6 496 398**	**11 648 863**	**16 197 216**	**20 193 339**	**22 607 928**	**21 862 522**	**20 625 021**	**19 457 567**	**18 356 195**	**17 317 165**	**16 336 948**	**15 412 216**	**14 539 826**	**13 716 817**	**12 940 393**
		ADDITIONAL INCOME		**6 195 385**	**11 689 406**	**16 541 612**	**20 807 059**	**24 536 626**	**23 147 760**	**21 837 510**	**20 601 424**	**19 435 306**	**18 335 194**	**17 297 353**	**16 318 258**	**15 394 583**	**14 523 191**	**13 701 124**	**12 925 588**

			6%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Pressure management			m3/annum	0	240 156	453 125	641 215	806 560	951 132	897 294	846 504	798 588	753 385	710 741	670 510	632 557	596 752	562 973	531 107
Mains replacement			m3/annum	102 317	193 051	273 185	343 629	405 222	382 285	360 647	340 233	320 974	302 806	285 666	269 496	254 242	239 851	226 274	213 466
Active and passive leakage control			m3/annum	125 583	236 950	335 306	421 769	497 369	469 216	442 657	417 601	393 963	371 663	350 625	330 779	312 055	294 392	277 728	262 008
Retrofitting & removal of wasteful devices			m3/annum	0	843 302	1 591 136	2 251 608	2 832 211	3 339 872	3 150 823	2 972 474	2 804 221	2 645 491	2 495 747	2 354 478	2 221 206	2 095 477	1 976 865	1 864 967
Water Wise Gardening			m3/annum	0	175 341	330 832	468 159	588 879	694 433	655 125	618 043	583 059	550 056	518 921	489 548	461 837	435 696	411 034	387 768
Meter reading, billing & cost recovery			m3/annum	0	974 117	1 837 957	2 600 882	3 271 550	3 857 960	3 639 585	3 433 571	3 239 218	3 055 866	2 882 892	2 719 710	2 565 764	2 420 532	2 283 521	2 154 265
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	0	476 666	899 370	1 272 693	1 600 872	1 699 038	1 780 962	1 680 153	1 585 050	1 495 330	1 410 689	1 330 839	1 255 508	1 184 442	1 117 398	1 054 149
Total			**m3/annum**	**227 900**	**3 139 583**	**5 720 911**	**7 999 954**	**10 002 663**	**11 393 936**	**10 927 092**	**10 308 578**	**9 725 073**	**9 174 597**	**8 655 281**	**8 165 359**	**7 703 169**	**7 267 141**	**6 855 793**	**6 467 729**

Unit reference values

All interventions				**45.3**	**8.5**	**4.4**	**3.0**	**2.2**	**1.9**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					4.7	2.4	1.6	1.2	0.9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				14.0	7.0	4.7	3.5	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					4.2	2.1	1.4	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					50.1	25.0	16.7	12.5	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					4.0	2.0	1.3	1.0	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management					3.1	1.5	1.0	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency					22.1	11.1	7.4	5.5	4.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			6%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2032-33**	**2032-33**	**2032-33**
Sectorisation		CAPEX	Rands	31 492	29 709	28 028	26 441	24 944	23 532	22 200	20 944	19 758	18 640	17 585	16 589	15 650	14 765	13 929	13 140
		OPEX	Rands	39 365	37 136	35 034	33 051	31 180	29 416	27 751	26 180	24 698	23 300	21 981	20 737	19 563	18 456	17 411	16 425
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	78 729	74 273	70 069	66 103	62 361	58 831	55 501	52 359	49 396	46 600	43 962	41 474	39 126	36 911	34 822	32 851
Mains replacement		CAPEX	Rands	689 668	650 630	613 802	579 059	546 282	515 360	486 189	458 669	432 706	408 214	385 107	363 309	342 744	323 343	305 041	287 774
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	689 668	650 630	613 802	579 059	546 282	515 360	486 189	458 669	432 706	408 214	385 107	363 309	342 744	323 343	305 041	287 774
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	174 108	164 252	154 955	146 184	137 910	130 103	122 739	115 791	109 237	103 054	97 221	91 718	86 526	81 628	77 008	72 649
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 199 254	2 074 768	1 957 328	1 846 536	1 742 015	1 643 410	1 550 387	1 462 629	1 379 839	1 301 735	1 228 052	1 158 539	1 092 962	1 031 096	972 732	917 672
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	141 713	133 691	126 124	118 985	112 250	105 896	99 902	94 247	88 912	83 880	79 132	74 652	70 427	66 440	62 680	59 132
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	15 746	14 855	14 014	13 221	12 472	11 766	11 100	10 472	9 879	9 320	8 792	8 295	7 825	7 382	6 964	6 570
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**895 268**	**844 592**	**796 785**	**751 684**	**709 136**	**668 996**	**631 128**	**595 404**	**561 702**	**529 907**	**499 913**	**471 616**	**444 921**	**419 736**	**395 978**	**373 564**
		OPEX		**3 164 474**	**2 985 353**	**2 816 371**	**2 656 954**	**2 506 560**	**2 364 679**	**2 230 830**	**2 104 556**	**1 985 430**	**1 873 047**	**1 767 026**	**1 667 006**	**1 572 647**	**1 483 629**	**1 399 650**	**1 320 425**
		TOTAL		**4 059 742**	**3 829 945**	**3 613 156**	**3 408 638**	**3 215 696**	**3 033 675**	**2 861 958**	**2 699 960**	**2 547 132**	**2 402 955**	**2 266 939**	**2 138 621**	**2 017 567**	**1 903 365**	**1 795 628**	**1 693 988**
		REDUCED PAYMENT		**12 207 918**	**11 516 904**	**10 865 004**	**10 250 004**	**9 669 815**	**9 122 467**	**8 606 101**	**8 118 963**	**7 659 399**	**7 225 848**	**6 816 838**	**6 430 979**	**6 066 961**	**5 723 548**	**5 399 574**	**5 093 938**
		ADDITIONAL INCOME		**12 193 951**	**11 503 728**	**10 852 573**	**10 238 277**	**9 658 752**	**9 112 030**	**8 596 255**	**8 109 674**	**7 650 636**	**7 217 581**	**6 809 039**	**6 423 621**	**6 060 020**	**5 717 000**	**5 393 396**	**5 088 110**

			6%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2032-33**	**2032-33**	**2032-33**
Pressure management			m3/annum	501 044	472 683	445 928	420 686	396 874	374 409	353 216	333 223	314 361	296 567	279 781	263 944	249 004	234 909	221 612	209 068
Mains replacement			m3/annum	201 383	189 984	179 230	169 085	159 514	150 485	141 967	133 931	126 350	119 198	112 451	106 086	100 081	94 416	89 072	84 030
Active and passive leakage control			m3/annum	247 177	233 186	219 987	207 535	195 787	184 705	174 250	164 387	155 082	146 304	138 022	130 210	122 839	115 886	109 327	103 138
Retrofitting & removal of wasteful devices			m3/annum	1 759 403	1 659 814	1 565 862	1 477 229	1 393 612	1 314 728	1 240 310	1 170 103	1 103 871	1 041 388	982 441	926 831	874 369	824 877	778 186	734 137
Water Wise Gardening			m3/annum	365 819	345 112	325 577	307 148	289 763	273 361	257 888	243 290	229 519	216 527	204 271	192 709	181 801	171 510	161 802	152 643
Meter reading, billing & cost recovery			m3/annum	2 032 325	1 917 288	1 808 762	1 706 379	1 609 792	1 518 672	1 432 709	1 351 612	1 275 106	1 202 930	1 134 840	1 070 604	1 010 003	952 833	898 899	848 018
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	994 480	938 189	885 084	834 985	787 721	743 133	701 069	661 386	623 949	588 631	555 313	523 880	494 226	466 251	439 860	414 962
Total			**m3/annum**	**6 101 631**	**5 756 256**	**5 430 430**	**5 123 047**	**4 833 063**	**4 559 494**	**4 301 409**	**4 057 933**	**3 828 239**	**3 611 546**	**3 407 119**	**3 214 263**	**3 032 324**	**2 860 683**	**2 698 757**	**2 545 998**

Unit reference values																			
All interventions				**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency				4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			6%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present cost			**Unit**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**Total**	**Average**
Sectorisation		CAPEX	Rands	12 397	11 695	11 033	10 408	9 819	9 263	8 739	8 244	7 778	7 338	6 922	6 530	6 161	5 812	1 316 467	28 619
		OPEX	Rands	15 496	14 619	13 791	13 011	12 274	11 579	10 924	10 306	9 722	9 172	8 653	8 163	7 701	7 265	1 645 583	35 774
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4 212 364	91 573
		OPEX	Rands	30 991	29 237	27 582	26 021	24 548	23 159	21 848	20 611	19 444	18 344	17 305	16 326	15 402	14 530	3 291 166	71 547
Mains replacement		CAPEX	Rands	271 485	256 118	241 621	227 944	215 042	202 870	191 386	180 553	170 333	160 692	151 596	143 015	134 920	127 283	28 830 618	626 753
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	271 485	256 118	241 621	227 944	215 042	202 870	191 386	180 553	170 333	160 692	151 596	143 015	134 920	127 283	28 830 618	626 753
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15 689 307	341 072
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	68 537	64 657	60 998	57 545	54 288	51 215	48 316	45 581	43 001	40 567	38 271	36 104	34 061	32 133	7 278 324	158 224
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	865 728	816 725	770 495	726 882	685 738	646 922	610 304	575 759	543 168	512 423	483 418	456 055	430 240	405 887	91 936 720	1 998 624
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	55 785	52 627	49 648	46 838	44 187	41 686	39 326	37 100	35 000	33 019	31 150	29 387	27 723	26 154	5 924 100	128 785
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	842 473	18 315
		OPEX	Rands	6 198	5 847	5 516	5 204	4 910	4 632	4 370	4 122	3 889	3 669	3 461	3 265	3 080	2 906	658 233	14 309
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15 689 307	341 072
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39 223 268	852 680
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**352 419**	**332 471**	**313 651**	**295 898**	**279 149**	**263 348**	**248 441**	**234 379**	**221 112**	**208 596**	**196 789**	**185 650**	**175 141**	**165 228**	**113 082 127**	**2 458 307**
		OPEX		**1 245 684**	**1 175 173**	**1 108 654**	**1 045 900**	**986 698**	**930 847**	**878 158**	**828 451**	**781 557**	**737 318**	**695 583**	**656 211**	**619 067**	**584 025**	**132 286 420**	**2 875 792**
		TOTAL		**1 598 102**	**1 507 644**	**1 422 305**	**1 341 798**	**1 265 847**	**1 194 195**	**1 126 599**	**1 062 829**	**1 002 669**	**945 914**	**892 372**	**841 860**	**794 208**	**749 253**	**245 368 547**	**5 334 099**
		REDUCED PAYMENT		**4 805 602**	**4 533 586**	**4 276 968**	**4 034 876**	**3 806 487**	**3 591 025**	**3 387 760**	**3 196 000**	**3 015 094**	**2 844 428**	**2 683 423**	**2 531 531**	**2 388 237**	**2 253 054**	**426 514 445**	**9 272 053**
		ADDITIONAL INCOME		**4 800 104**	**4 528 400**	**4 272 075**	**4 030 260**	**3 802 132**	**3 586 917**	**3 383 884**	**3 192 343**	**3 011 644**	**2 841 174**	**2 680 353**	**2 528 635**	**2 385 504**	**2 250 476**	**451 205 919**	**9 808 824**

			6%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present saving			**Unit**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**Total**	**Average**
Pressure management			m3/annum	197 234	186 070	175 538	165 602	156 228	147 385	139 042	131 172	123 747	116 743	110 135	103 901	98 019	92 471	**17 403 196**	**378 330**
Mains replacement			m3/annum	79 274	74 787	70 553	66 560	62 792	59 238	55 885	52 722	49 737	46 922	44 266	41 760	39 397	37 167	**7 451 667**	**161 993**
Active and passive leakage control			m3/annum	97 300	91 793	86 597	81 695	77 071	72 708	68 593	64 710	61 047	57 592	54 332	51 257	48 355	45 618	**9 146 156**	**198 829**
Retrofitting & removal of wasteful devices			m3/annum	692 582	653 380	616 396	581 506	548 590	517 538	488 243	460 607	434 535	409 938	386 734	364 844	344 192	324 710	**61 110 835**	**1 328 496**
Water Wise Gardening			m3/annum	144 003	135 852	128 162	120 908	114 064	107 607	101 517	95 770	90 349	85 235	80 411	75 859	71 565	67 514	**12 706 286**	**276 224**
Meter reading, billing & cost recovery			m3/annum	800 017	754 733	712 013	671 710	633 689	597 819	563 981	532 057	501 941	473 529	446 725	421 439	397 584	375 079	**70 590 479**	**1 534 576**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	391 473	369 315	348 410	328 689	310 084	292 532	275 973	260 352	245 615	231 713	218 597	206 223	194 550	183 538	**34 353 341**	**746 812**
Total			**m3/annum**	**2 401 884**	**2 265 929**	**2 137 669**	**2 016 669**	**1 902 517**	**1 794 828**	**1 693 234**	**1 597 390**	**1 506 972**	**1 421 672**	**1 341 200**	**1 265 283**	**1 193 663**	**1 126 097**	**212 761 960**	**4 625 260**

Unit reference values

All interventions				**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**1.2**	**1.2**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.9	3.9
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.2	3.2
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	3.1
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3
Management				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
Awareness campaigns & Efficiency				4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	5.4	5.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			8%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Sectorisation		CAPEX	Rands	80 000	74 074	68 587	63 507	58 802	54 447	50 414	46 679	43 222	40 020	37 055	34 311	31 769	29 416	27 237	25 219
		OPEX	Rands	100 000	92 593	85 734	79 383	73 503	68 058	63 017	58 349	54 027	50 025	46 319	42 888	39 711	36 770	34 046	31 524
Pressure management		CAPEX	Rands	0	925 926	857 339	793 832	735 030	680 583	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	200 000	185 185	171 468	158 766	147 006	136 117	126 034	116 698	108 054	100 050	92 639	85 777	79 423	73 540	68 092	63 048
Mains replacement		CAPEX	Rands	1 752 000	1 622 222	1 502 058	1 390 794	1 287 772	1 192 382	1 104 057	1 022 275	946 551	876 436	811 515	751 403	695 743	644 207	596 488	552 303
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 752 000	1 622 222	1 502 058	1 390 794	1 287 772	1 192 382	1 104 057	1 022 275	946 551	876 436	811 515	751 403	695 743	644 207	596 488	552 303
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	3 448 690	3 193 231	2 956 696	2 737 681	2 534 890	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	442 294	409 532	379 196	351 108	325 100	301 018	278 721	258 075	238 958	221 257	204 868	189 693	175 641	162 631	150 584	139 430
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	5 586 878	5 173 035	4 789 847	4 435 044	4 106 522	3 802 335	3 520 681	3 259 889	3 018 416	2 794 830	2 587 805	2 396 116	2 218 626	2 054 283	1 902 114	1 761 217
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	360 000	333 333	308 642	285 780	264 611	245 010	226 861	210 057	194 497	180 090	166 750	154 398	142 961	132 371	122 566	113 487
Management meters		CAPEX	Rands	0	185 185	171 468	158 766	147 006	136 117	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	40 000	37 037	34 294	31 753	29 401	27 223	25 207	23 340	21 611	20 010	18 528	17 155	15 885	14 708	13 618	12 610
Consumer meters		CAPEX	Rands	0	3 448 690	3 193 231	2 956 696	2 737 681	2 534 890	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	8 621 725	7 983 078	7 391 739	6 844 203	6 337 225	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**2 274 294**	**18 736 044**	**17 348 189**	**16 063 138**	**14 873 276**	**13 771 551**	**1 433 191**	**1 327 029**	**1 228 731**	**1 137 713**	**1 053 438**	**975 406**	**903 154**	**836 253**	**774 309**	**716 952**
		OPEX		**8 038 878**	**7 443 405**	**6 892 042**	**6 381 520**	**5 908 815**	**5 471 125**	**5 065 856**	**4 690 608**	**4 343 155**	**4 021 440**	**3 723 556**	**3 447 737**	**3 192 349**	**2 955 879**	**2 736 925**	**2 534 189**
		TOTAL		**10 313 172**	**26 179 449**	**24 240 231**	**22 444 658**	**20 782 091**	**19 242 677**	**6 499 048**	**6 017 637**	**5 571 886**	**5 159 154**	**4 776 994**	**4 423 143**	**4 095 503**	**3 792 132**	**3 511 233**	**3 251 142**
		REDUCED PAYMENT		**683 700**	**6 376 094**	**11 221 419**	**15 313 932**	**18 738 575**	**20 590 709**	**19 543 076**	**18 095 441**	**16 755 038**	**15 513 924**	**14 364 744**	**13 300 689**	**12 315 453**	**11 403 197**	**10 558 516**	**9 776 404**
		ADDITIONAL INCOME		**6 195 385**	**11 472 935**	**15 934 632**	**19 672 385**	**22 768 964**	**21 082 375**	**19 520 717**	**18 074 738**	**16 735 869**	**15 496 175**	**14 348 310**	**13 285 472**	**12 301 363**	**11 390 151**	**10 546 436**	**9 765 219**

			8%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Pressure management			m3/annum	0	235 709	436 498	606 247	748 454	866 266	802 098	742 683	687 670	636 731	589 566	545 894	505 458	468 016	433 349	401 249
Mains replacement			m3/annum	102 317	189 476	263 160	324 889	376 030	348 175	322 385	298 504	276 393	255 919	236 962	219 410	203 157	188 108	174 174	161 273
Active and passive leakage control			m3/annum	125 583	232 562	323 002	398 768	461 538	427 350	395 694	366 383	339 244	314 115	290 847	269 303	249 354	230 884	213 781	197 946
Retrofitting & removal of wasteful devices			m3/annum	0	827 686	1 532 751	2 128 821	2 628 174	3 041 868	2 816 544	2 607 912	2 414 733	2 235 864	2 070 244	1 916 893	1 774 901	1 643 427	1 521 691	1 408 973
Water Wise Gardening			m3/annum	0	172 094	318 693	442 629	546 455	632 471	585 622	542 242	502 076	464 885	430 449	398 564	369 041	341 705	316 393	292 957
Meter reading, billing & cost recovery			m3/annum	0	956 078	1 770 515	2 459 048	3 035 862	3 513 729	3 253 453	3 012 456	2 789 311	2 582 696	2 391 385	2 214 245	2 050 227	1 898 358	1 757 739	1 627 536
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	0	467 839	866 368	1 203 289	1 485 542	1 547 440	1 592 016	1 474 089	1 364 897	1 263 794	1 170 179	1 083 499	1 003 240	928 926	860 117	796 404
Total			**m3/annum**	**227 900**	**3 081 443**	**5 510 988**	**7 563 692**	**9 282 054**	**10 377 299**	**9 767 812**	**9 044 270**	**8 374 324**	**7 754 004**	**7 179 633**	**6 647 808**	**6 155 378**	**5 699 424**	**5 277 245**	**4 886 338**

Unit reference values

All interventions				**45.3**	**8.5**	**4.4**	**3.0**	**2.2**	**1.9**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					4.7	2.4	1.6	1.2	0.9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				14.0	7.0	4.7	3.5	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					4.2	2.1	1.4	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					50.1	25.0	16.7	12.5	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					4.0	2.0	1.3	1.0	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management					3.1	1.5	1.0	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency					22.1	11.1	7.4	5.5	4.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			8%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2032-33**	**2032-33**	**2032-33**
Sectorisation		CAPEX	Rands	23 351	21 622	20 020	18 537	17 164	15 892	14 715	13 625	12 616	11 681	10 816	10 015	9 273	8 586	7 950	7 361
		OPEX	Rands	29 189	27 027	25 025	23 171	21 455	19 866	18 394	17 032	15 770	14 602	13 520	12 519	11 591	10 733	9 938	9 202
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	58 378	54 054	50 050	46 342	42 910	39 731	36 788	34 063	31 540	29 204	27 040	25 037	23 183	21 466	19 875	18 403
Mains replacement		CAPEX	Rands	511 392	473 511	438 436	405 960	375 888	348 045	322 264	298 392	276 289	255 823	236 873	219 327	203 081	188 038	174 109	161 212
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	511 392	473 511	438 436	405 960	375 888	348 045	322 264	298 392	276 289	255 823	236 873	219 327	203 081	188 038	174 109	161 212
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	129 102	119 538	110 684	102 485	94 893	87 864	81 356	75 330	69 750	64 583	59 799	55 369	51 268	47 470	43 954	40 698
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 630 756	1 509 960	1 398 111	1 294 547	1 198 655	1 109 865	1 027 653	951 531	881 047	815 784	755 356	699 403	647 596	599 626	555 209	514 082
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	105 081	97 297	90 090	83 416	77 237	71 516	66 219	61 314	56 772	52 566	48 673	45 067	41 729	38 638	35 776	33 126
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	11 676	10 811	10 010	9 268	8 582	7 946	7 358	6 813	6 308	5 841	5 408	5 007	4 637	4 293	3 975	3 681
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**663 845**	**614 671**	**569 140**	**526 981**	**487 946**	**451 802**	**418 335**	**387 347**	**358 655**	**332 088**	**307 489**	**284 712**	**263 622**	**244 094**	**226 013**	**209 272**
		OPEX		**2 346 472**	**2 172 659**	**2 011 721**	**1 862 705**	**1 724 727**	**1 596 969**	**1 478 675**	**1 369 144**	**1 267 726**	**1 173 820**	**1 086 870**	**1 006 362**	**931 816**	**862 793**	**798 882**	**739 706**
		TOTAL		**3 010 317**	**2 787 330**	**2 580 861**	**2 389 686**	**2 212 673**	**2 048 771**	**1 897 010**	**1 756 491**	**1 626 380**	**1 505 908**	**1 394 359**	**1 291 073**	**1 195 438**	**1 106 887**	**1 024 896**	**948 977**
		REDUCED PAYMENT		**9 052 226**	**8 381 690**	**7 760 824**	**7 185 949**	**6 653 656**	**6 160 793**	**5 704 438**	**5 281 887**	**4 890 636**	**4 528 367**	**4 192 932**	**3 882 344**	**3 594 763**	**3 328 485**	**3 081 930**	**2 853 639**
		ADDITIONAL INCOME		**9 041 869**	**8 372 101**	**7 751 945**	**7 177 727**	**6 646 044**	**6 153 744**	**5 697 911**	**5 275 844**	**4 885 041**	**4 523 186**	**4 188 135**	**3 877 903**	**3 590 651**	**3 324 676**	**3 078 404**	**2 850 374**

			8%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2032-33**	**2032-33**	**2032-33**
Pressure management			m3/annum	371 527	344 006	318 524	294 930	273 083	252 855	234 125	216 782	200 724	185 856	172 089	159 341	147 538	136 610	126 490	117 121
Mains replacement			m3/annum	149 326	138 265	128 023	118 540	109 759	101 629	94 101	87 131	80 676	74 700	69 167	64 044	59 300	54 907	50 840	47 074
Active and passive leakage control			m3/annum	183 283	169 706	157 136	145 496	134 718	124 739	115 499	106 944	99 022	91 687	84 895	78 607	72 784	67 393	62 401	57 778
Retrofitting & removal of wasteful devices			m3/annum	1 304 605	1 207 968	1 118 489	1 035 638	958 924	887 892	822 122	761 225	704 838	652 627	604 285	559 523	518 077	479 701	444 167	411 266
Water Wise Gardening			m3/annum	271 256	251 163	232 558	215 332	199 381	184 612	170 937	158 275	146 551	135 696	125 644	116 337	107 720	99 740	92 352	85 511
Meter reading, billing & cost recovery			m3/annum	1 506 978	1 395 350	1 291 991	1 196 288	1 107 674	1 025 624	949 652	879 307	814 173	753 864	698 022	646 317	598 442	554 113	513 067	475 062
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	737 411	682 788	632 211	585 381	542 019	501 870	464 694	430 272	398 400	368 889	341 564	316 263	292 836	271 145	251 060	232 463
Total			**m3/annum**	**4 524 387**	**4 189 247**	**3 878 932**	**3 591 604**	**3 325 559**	**3 079 222**	**2 851 131**	**2 639 936**	**2 444 385**	**2 263 320**	**2 095 666**	**1 940 432**	**1 796 696**	**1 663 608**	**1 540 377**	**1 426 275**

Unit reference values																			
All interventions				**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency				4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			8%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present cost			**Unit**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**Total**	**Average**
Sectorisation		CAPEX	Rands	6 816	6 311	5 844	5 411	5 010	4 639	4 295	3 977	3 682	3 410	3 157	2 923	2 707	2 506	1 048 672	22 797
		OPEX	Rands	8 520	7 889	7 305	6 763	6 262	5 799	5 369	4 971	4 603	4 262	3 946	3 654	3 383	3 133	1 310 840	28 497
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 992 710	86 798
		OPEX	Rands	17 040	15 778	14 609	13 527	12 525	11 597	10 738	9 943	9 206	8 524	7 893	7 308	6 767	6 266	2 621 680	56 993
Mains replacement		CAPEX	Rands	149 270	138 213	127 975	118 496	109 718	101 591	94 066	87 098	80 646	74 672	69 141	64 020	59 277	54 886	22 965 919	499 259
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	149 270	138 213	127 975	118 496	109 718	101 591	94 066	87 098	80 646	74 672	69 141	64 020	59 277	54 886	22 965 919	499 259
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 871 188	323 287
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	37 684	34 892	32 308	29 914	27 699	25 647	23 747	21 988	20 359	18 851	17 455	16 162	14 965	13 856	5 797 774	126 039
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	476 002	440 743	408 095	377 866	349 876	323 959	299 962	277 743	257 169	238 120	220 481	204 149	189 027	175 025	73 235 035	1 592 066
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	30 672	28 400	26 296	24 348	22 545	20 875	19 329	17 897	16 571	15 344	14 207	13 155	12 180	11 278	4 719 025	102 587
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	798 542	17 360
		OPEX	Rands	3 408	3 156	2 922	2 705	2 505	2 319	2 148	1 989	1 841	1 705	1 579	1 462	1 353	1 253	524 336	11 399
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 871 188	323 287
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37 177 970	808 217
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**193 770**	**179 417**	**166 127**	**153 821**	**142 427**	**131 877**	**122 108**	**113 063**	**104 688**	**96 933**	**89 753**	**83 105**	**76 949**	**71 249**	**101 523 964**	**2 207 043**
		OPEX		**684 913**	**634 178**	**587 202**	**543 706**	**503 431**	**466 140**	**431 611**	**399 640**	**370 037**	**342 627**	**317 247**	**293 747**	**271 988**	**251 841**	**105 376 835**	**2 290 801**
		TOTAL		**878 683**	**813 595**	**753 329**	**697 527**	**645 858**	**598 017**	**553 719**	**512 703**	**474 725**	**439 560**	**407 000**	**376 852**	**348 937**	**323 090**	**206 900 799**	**4 497 843**
		REDUCED PAYMENT		**2 642 258**	**2 446 536**	**2 265 311**	**2 097 510**	**1 942 139**	**1 798 277**	**1 665 071**	**1 541 732**	**1 427 530**	**1 321 787**	**1 223 877**	**1 133 219**	**1 049 277**	**971 553**	**324 611 546**	**7 056 773**
		ADDITIONAL INCOME		**2 639 235**	**2 443 736**	**2 262 719**	**2 095 110**	**1 939 917**	**1 796 219**	**1 663 166**	**1 539 969**	**1 425 897**	**1 320 275**	**1 222 477**	**1 131 923**	**1 048 077**	**970 441**	**348 525 841**	**7 576 649**

			8%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present saving			**Unit**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**Total**	**Average**
Pressure management			m3/annum	108 445	100 412	92 974	86 087	79 710	73 806	68 339	63 277	58 589	54 250	50 231	46 510	43 065	39 875	**13 223 059**	**287 458**
Mains replacement			m3/annum	43 587	40 358	37 369	34 601	32 038	29 665	27 467	25 433	23 549	21 804	20 189	18 694	17 309	16 027	**5 755 905**	**125 128**
Active and passive leakage control			m3/annum	53 499	49 536	45 866	42 469	39 323	36 410	33 713	31 216	28 904	26 763	24 780	22 945	21 245	19 671	**7 064 782**	**153 582**
Retrofitting & removal of wasteful devices			m3/annum	380 802	352 594	326 476	302 293	279 901	259 167	239 970	222 194	205 735	190 496	176 385	163 319	151 222	140 020	**46 432 399**	**1 009 400**
Water Wise Gardening			m3/annum	79 177	73 312	67 882	62 853	58 198	53 887	49 895	46 199	42 777	39 608	36 674	33 958	31 442	29 113	**9 654 317**	**209 876**
Meter reading, billing & cost recovery			m3/annum	439 873	407 289	377 120	349 185	323 319	299 370	277 194	256 661	237 649	220 046	203 746	188 654	174 679	161 740	**53 635 092**	**1 165 980**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	215 243	199 299	184 536	170 867	158 210	146 491	135 640	125 592	116 289	107 675	99 699	92 314	85 476	79 145	**26 073 386**	**566 813**
Total			**m3/annum**	**1 320 625**	**1 222 801**	**1 132 223**	**1 048 355**	**970 699**	**898 795**	**832 218**	**770 572**	**713 493**	**660 641**	**611 705**	**566 394**	**524 438**	**485 591**	**161 838 941**	**3 518 238**

Unit reference values

All interventions				**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**1.3**	**1.3**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.5
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.0	4.0
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.3	3.3
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	3.9
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.4
Management				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
Awareness campaigns & Efficiency				4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	5.6	5.6

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Sectorisation		CAPEX	Rands	80 000	72 727	66 116	60 105	54 641	49 674	45 158	41 053	37 321	33 928	30 843	28 040	25 490	23 173	21 067	19 151
		OPEX	Rands	100 000	90 909	82 645	75 131	68 301	62 092	56 447	51 316	46 651	42 410	38 554	35 049	31 863	28 966	26 333	23 939
Pressure management		CAPEX	Rands	0	909 091	826 446	751 315	683 013	620 921	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	200 000	181 818	165 289	150 263	136 603	124 184	112 895	102 632	93 301	84 820	77 109	70 099	63 726	57 933	52 666	47 878
Mains replacement		CAPEX	Rands	1 752 000	1 592 727	1 447 934	1 316 304	1 196 640	1 087 854	988 958	899 053	817 321	743 019	675 472	614 065	558 241	507 492	461 356	419 415
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 752 000	1 592 727	1 447 934	1 316 304	1 196 640	1 087 854	988 958	899 053	817 321	743 019	675 472	614 065	558 241	507 492	461 356	419 415
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	3 385 986	3 078 169	2 798 336	2 543 942	2 312 674	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	442 294	402 086	365 533	332 302	302 093	274 630	249 664	226 967	206 334	187 576	170 524	155 022	140 929	128 117	116 470	105 882
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	5 586 878	5 078 980	4 617 254	4 197 504	3 815 913	3 469 011	3 153 647	2 866 952	2 606 320	2 369 381	2 153 983	1 958 167	1 780 151	1 618 319	1 471 199	1 337 454
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	360 000	327 273	297 521	270 473	245 885	223 532	203 211	184 737	167 943	152 675	138 796	126 178	114 707	104 279	94 799	86 181
Management meters		CAPEX	Rands	0	181 818	165 289	150 263	136 603	124 184	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	40 000	36 364	33 058	30 053	27 321	24 837	22 579	20 526	18 660	16 964	15 422	14 020	12 745	11 587	10 533	9 576
Consumer meters		CAPEX	Rands	0	3 385 986	3 078 169	2 798 336	2 543 942	2 312 674	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	8 464 966	7 695 424	6 995 840	6 359 854	5 781 686	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**2 274 294**	**18 395 388**	**16 723 080**	**15 202 800**	**13 820 728**	**12 564 298**	**1 283 780**	**1 167 073**	**1 060 975**	**964 523**	**876 839**	**797 126**	**724 660**	**658 782**	**598 893**	**544 448**
		OPEX		**8 038 878**	**7 308 071**	**6 643 700**	**6 039 728**	**5 490 662**	**4 991 511**	**4 537 737**	**4 125 215**	**3 750 196**	**3 409 269**	**3 099 335**	**2 817 578**	**2 561 434**	**2 328 576**	**2 116 888**	**1 924 443**
		TOTAL		**10 313 172**	**25 703 459**	**23 366 781**	**21 242 528**	**19 311 389**	**17 555 808**	**5 821 517**	**5 292 288**	**4 811 171**	**4 373 792**	**3 976 174**	**3 614 704**	**3 286 094**	**2 987 359**	**2 715 781**	**2 468 891**
		REDUCED PAYMENT		**683 700**	**6 260 165**	**10 817 077**	**14 493 722**	**17 412 489**	**18 785 668**	**17 505 695**	**15 914 268**	**14 467 516**	**13 152 287**	**11 956 625**	**10 869 659**	**9 881 508**	**8 983 189**	**8 166 536**	**7 424 123**
		ADDITIONAL INCOME		**6 195 385**	**11 264 336**	**15 360 459**	**18 618 738**	**21 157 656**	**19 234 233**	**17 485 666**	**15 896 060**	**14 450 964**	**13 137 240**	**11 942 945**	**10 857 223**	**9 870 203**	**8 972 912**	**8 157 192**	**7 415 630**

			10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Pressure management			m3/annum	0	231 423	420 770	573 777	695 487	790 326	718 479	653 162	593 784	539 804	490 731	446 119	405 562	368 693	335 176	304 705
Mains replacement			m3/annum	102 317	186 031	253 678	307 489	349 419	317 653	288 776	262 523	238 658	216 962	197 238	179 307	163 006	148 188	134 716	122 469
Active and passive leakage control			m3/annum	125 583	228 333	311 364	377 411	428 876	389 887	354 443	322 221	292 928	266 298	242 089	220 081	200 074	181 885	165 350	150 318
Retrofitting & removal of wasteful devices			m3/annum	0	812 637	1 477 521	2 014 802	2 442 184	2 775 209	2 522 917	2 293 561	2 085 056	1 895 505	1 723 187	1 566 533	1 424 121	1 294 656	1 176 960	1 069 963
Water Wise Gardening			m3/annum	0	168 965	307 209	418 922	507 784	577 027	524 570	476 882	433 529	394 117	358 288	325 717	296 106	269 187	244 716	222 469
Meter reading, billing & cost recovery			m3/annum	0	938 695	1 706 718	2 327 342	2 821 021	3 205 706	2 914 278	2 649 343	2 408 494	2 189 540	1 990 491	1 809 537	1 645 034	1 495 485	1 359 532	1 235 938
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	0	459 333	835 150	1 138 841	1 380 414	1 411 787	1 426 047	1 296 406	1 178 551	1 071 410	974 009	885 463	804 966	731 788	665 261	604 783
Total			**m3/annum**	**227 900**	**3 025 416**	**5 312 410**	**7 158 583**	**8 625 184**	**9 467 595**	**8 749 509**	**7 954 099**	**7 230 999**	**6 573 636**	**5 976 033**	**5 432 757**	**4 938 870**	**4 489 882**	**4 081 711**	**3 710 646**

Unit reference values

All interventions				**45.3**	**8.5**	**4.4**	**3.0**	**2.2**	**1.9**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					4.7	2.4	1.6	1.2	0.9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				14.0	7.0	4.7	3.5	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					4.2	2.1	1.4	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					50.1	25.0	16.7	12.5	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					4.0	2.0	1.3	1.0	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management					3.1	1.5	1.0	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency					22.1	11.1	7.4	5.5	4.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2032-33**	**2032-33**	**2032-33**
Sectorisation		CAPEX	Rands	17 410	15 828	14 389	13 081	11 891	10 810	9 828	8 934	8 122	7 384	6 712	6 102	5 547	5 043	4 585	4 168
		OPEX	Rands	21 763	19 784	17 986	16 351	14 864	13 513	12 285	11 168	10 153	9 230	8 391	7 628	6 934	6 304	5 731	5 210
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	43 526	39 569	35 972	32 702	29 729	27 026	24 569	22 336	20 305	18 459	16 781	15 256	13 869	12 608	11 462	10 420
Mains replacement		CAPEX	Rands	381 286	346 624	315 113	286 466	260 424	236 749	215 226	195 660	177 873	161 703	147 002	133 639	121 490	110 445	100 405	91 277
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	381 286	346 624	315 113	286 466	260 424	236 749	215 226	195 660	177 873	161 703	147 002	133 639	121 490	110 445	100 405	91 277
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	96 256	87 506	79 551	72 319	65 744	59 768	54 334	49 395	44 904	40 822	37 111	33 737	30 670	27 882	25 347	23 043
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 215 867	1 105 334	1 004 849	913 499	830 454	754 958	686 325	623 932	567 211	515 646	468 769	426 154	387 413	352 193	320 176	291 069
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	78 346	71 224	64 749	58 863	53 512	48 647	44 225	40 204	36 549	33 227	30 206	27 460	24 964	22 694	20 631	18 756
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	8 705	7 914	7 194	6 540	5 946	5 405	4 914	4 467	4 061	3 692	3 356	3 051	2 774	2 522	2 292	2 084
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**494 953**	**449 957**	**409 052**	**371 865**	**338 059**	**307 327**	**279 388**	**253 989**	**230 899**	**209 908**	**190 826**	**173 478**	**157 707**	**143 370**	**130 337**	**118 488**
		OPEX		**1 749 494**	**1 590 449**	**1 445 863**	**1 314 421**	**1 194 928**	**1 086 298**	**987 544**	**897 767**	**816 152**	**741 956**	**674 506**	**613 187**	**557 443**	**506 766**	**460 696**	**418 815**
		TOTAL		**2 244 447**	**2 040 406**	**1 854 915**	**1 686 286**	**1 532 987**	**1 393 625**	**1 266 932**	**1 151 756**	**1 047 051**	**951 865**	**865 331**	**786 665**	**715 150**	**650 136**	**591 033**	**537 303**
		REDUCED PAYMENT		**6 749 203**	**6 135 639**	**5 577 854**	**5 070 776**	**4 609 796**	**4 190 724**	**3 809 749**	**3 463 408**	**3 148 553**	**2 862 321**	**2 602 110**	**2 365 554**	**2 150 504**	**1 955 004**	**1 777 276**	**1 615 706**
		ADDITIONAL INCOME		**6 741 481**	**6 128 619**	**5 571 472**	**5 064 975**	**4 604 522**	**4 185 930**	**3 805 390**	**3 459 446**	**3 144 951**	**2 859 046**	**2 599 133**	**2 362 848**	**2 148 044**	**1 952 767**	**1 775 243**	**1 613 857**

			10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2032-33**	**2032-33**	**2032-33**
Pressure management			m3/annum	277 005	251 822	228 929	208 118	189 198	171 998	156 362	142 147	129 225	117 477	106 797	97 088	88 262	80 238	72 944	66 313
Mains replacement			m3/annum	111 336	101 214	92 013	83 648	76 044	69 131	62 846	57 133	51 939	47 217	42 925	39 022	35 475	32 250	29 318	26 653
Active and passive leakage control			m3/annum	136 653	124 230	112 936	102 669	93 336	84 851	77 137	70 125	63 750	57 954	52 686	47 896	43 542	39 584	35 985	32 714
Retrofitting & removal of wasteful devices			m3/annum	972 694	884 267	803 879	730 799	664 363	603 966	549 060	499 146	453 769	412 517	375 016	340 923	309 930	281 755	256 141	232 855
Water Wise Gardening			m3/annum	202 244	183 859	167 144	151 949	138 136	125 578	114 162	103 783	94 349	85 771	77 974	70 885	64 441	58 583	53 257	48 416
Meter reading, billing & cost recovery			m3/annum	1 123 580	1 021 437	928 579	844 162	767 420	697 655	634 232	576 574	524 158	476 508	433 189	393 808	358 007	325 461	295 874	268 976
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	549 803	499 821	454 383	413 075	375 523	341 384	310 349	282 136	256 487	233 170	211 973	192 703	175 184	159 258	144 780	131 618
Total			**m3/annum**	**3 373 315**	**3 066 650**	**2 787 863**	**2 534 421**	**2 304 019**	**2 094 563**	**1 904 148**	**1 731 044**	**1 573 676**	**1 430 615**	**1 300 559**	**1 182 326**	**1 074 842**	**977 129**	**888 299**	**807 545**

Unit reference values

All interventions				**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency				4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 1

The Msunduzi Local Municipality

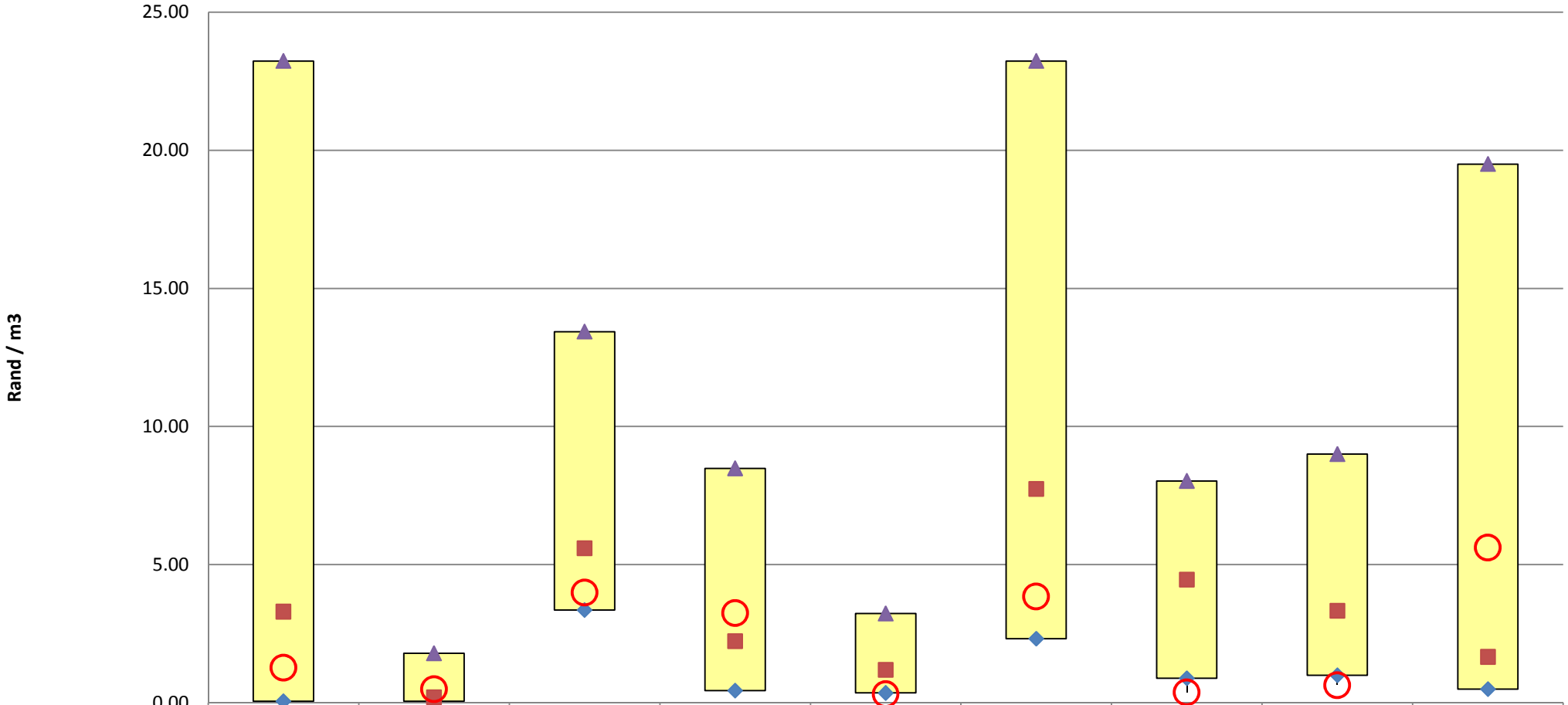
Unit Reference Value (URV) Calculations

			10%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present cost			**Unit**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**Total**	**Average**
Sectorisation		CAPEX	Rands	3 789	3 445	3 131	2 847	2 588	2 353	2 139	1 944	1 768	1 607	1 461	1 328	1 207	1 098	869 025	18 892
		OPEX	Rands	4 736	4 306	3 914	3 558	3 235	2 941	2 673	2 430	2 209	2 009	1 826	1 660	1 509	1 372	1 086 281	23 615
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 790 787	82 408
		OPEX	Rands	9 472	8 611	7 829	7 117	6 470	5 882	5 347	4 861	4 419	4 017	3 652	3 320	3 018	2 744	2 172 562	47 230
Mains replacement		CAPEX	Rands	82 979	75 435	68 578	62 343	56 676	51 523	46 839	42 581	38 710	35 191	31 992	29 084	26 440	24 036	19 031 639	413 731
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	82 979	75 435	68 578	62 343	56 676	51 523	46 839	42 581	38 710	35 191	31 992	29 084	26 440	24 036	19 031 639	413 731
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 119 108	306 937
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	20 948	19 044	17 313	15 739	14 308	13 007	11 825	10 750	9 772	8 884	8 076	7 342	6 675	6 068	4 804 560	104 447
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	264 608	240 553	218 684	198 804	180 731	164 301	149 364	135 786	123 442	112 220	102 018	92 744	84 312	76 648	60 689 178	1 319 330
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	17 050	15 500	14 091	12 810	11 646	10 587	9 625	8 750	7 954	7 231	6 574	5 976	5 433	4 939	3 910 611	85 013
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	758 157	16 482
		OPEX	Rands	1 894	1 722	1 566	1 423	1 294	1 176	1 069	972	884	803	730	664	604	549	434 512	9 446
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 119 108	306 937
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35 297 769	767 343
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**107 716**	**97 924**	**89 022**	**80 929**	**73 572**	**66 883**	**60 803**	**55 275**	**50 250**	**45 682**	**41 529**	**37 754**	**34 322**	**31 202**	**92 790 153**	**2 017 177**
		OPEX		**380 741**	**346 128**	**314 662**	**286 056**	**260 051**	**236 410**	**214 918**	**195 380**	**177 618**	**161 471**	**146 792**	**133 447**	**121 316**	**110 287**	**87 324 783**	**1 898 365**
		TOTAL		**488 457**	**444 052**	**403 683**	**366 985**	**333 623**	**303 293**	**275 721**	**250 656**	**227 869**	**207 153**	**188 321**	**171 201**	**155 637**	**141 489**	**180 114 936**	**3 915 542**
		REDUCED PAYMENT		**1 468 823**	**1 335 294**	**1 213 903**	**1 103 549**	**1 003 226**	**912 024**	**829 112**	**753 739**	**685 217**	**622 924**	**566 295**	**514 814**	**468 012**	**425 466**	**256 760 804**	**5 581 757**
		ADDITIONAL INCOME		**1 467 143**	**1 333 766**	**1 212 515**	**1 102 286**	**1 002 078**	**910 980**	**828 164**	**752 876**	**684 433**	**622 212**	**565 647**	**514 225**	**467 477**	**424 979**	**279 923 348**	**6 085 290**

			10%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present saving			**Unit**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**2032-33**	**Total**	**Average**
Pressure management			m3/annum	60 284	54 804	49 822	45 292	41 175	37 432	34 029	30 935	28 123	25 566	23 242	21 129	19 208	17 462	**10 440 426**	**226 966**
Mains replacement			m3/annum	24 230	22 027	20 025	18 204	16 549	15 045	13 677	12 434	11 303	10 276	9 342	8 492	7 720	7 019	**4 622 935**	**100 499**
Active and passive leakage control			m3/annum	29 740	27 036	24 578	22 344	20 313	18 466	16 787	15 261	13 874	12 613	11 466	10 424	9 476	8 615	**5 674 178**	**123 352**
Retrofitting & removal of wasteful devices			m3/annum	211 687	192 442	174 948	159 043	144 585	131 441	119 492	108 629	98 753	89 776	81 614	74 195	67 450	61 318	**36 661 264**	**796 984**
Water Wise Gardening			m3/annum	44 014	40 013	36 375	33 069	30 062	27 329	24 845	22 586	20 533	18 666	16 969	15 427	14 024	12 749	**7 622 683**	**165 710**
Meter reading, billing & cost recovery			m3/annum	244 524	222 294	202 086	183 714	167 013	151 830	138 027	125 479	114 072	103 702	94 275	85 704	77 913	70 830	**42 348 238**	**920 614**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	119 653	108 776	98 887	89 897	81 725	74 295	67 541	61 401	55 819	50 745	46 131	41 938	38 125	34 659	**20 565 449**	**447 075**
Total			**m3/annum**	**734 132**	**667 392**	**606 720**	**551 564**	**501 422**	**455 838**	**414 398**	**376 726**	**342 478**	**311 343**	**283 039**	**257 309**	**233 917**	**212 652**	**127 935 172**	**2 781 199**

Unit reference values																			
All interventions				**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**1.4**	**1.4**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.6
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.1	4.1
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.4	3.4
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	4.6
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.4
Management				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7
Awareness campaigns & Efficiency				4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	5.9	5.9

KZN METRO WC/WDM POTENTIAL ASSESSMENT
Msunduzi Unit Reference Values - Scenario 1



	All interventions	Pressure management	Mains replacement	Leak detection & repair	Retrofitting	Water Wise	Metering and billing	Management	Awareness campaigns
Ideal conditions	0.06	0.06	3.36	0.44	0.36	2.32	0.89	1.00	0.50
Expected conditions	3.30	0.21	5.60	2.23	1.20	7.74	4.46	3.33	1.67
Msunduzi	1.28	0.50	3.99	3.25	0.32	3.85	0.39	0.64	5.62
Poor conditions	23.23	1.79	13.43	8.49	3.23	23.23	8.03	9.00	19.50

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality			Unit	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**
Billed consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 321 648	26 764 063	26 206 478	25 648 894	25 091 309	24 533 724	23 976 140	23 418 555	22 860 971	22 303 386
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 321 648	26 764 063	26 206 478	25 648 894	25 091 309	24 533 724	23 976 140	23 418 555	22 860 971	22 303 386
Unbilled potential paid consumption	% of system input volume	10.0%	m3/annum	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851
Total potential revenue water		67%	**m3/annum**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**33 825 319**	**33 267 734**	**32 710 150**	**32 152 565**	**31 594 981**	**31 037 396**	**30 479 811**	**29 922 227**	**29 364 642**	**28 807 057**
Non-revenue water			**m3/annum**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 802 889**	**18 360 474**	**18 918 058**	**19 475 643**	**20 033 227**	**20 590 812**	**21 148 397**	**21 705 981**	**22 263 566**	**22 821 151**
Unbilled consumption	% of system input volume	1%	m3/annum	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282
Apparent losses		20%	m3/annum	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 560 578	3 672 095	3 783 612	3 895 129	4 006 645	4 118 162	4 229 679	4 341 196	4 452 713	4 564 230
Unavoidable annual real losses		2.0	m3/annum	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%
Potential saving (Real losses)			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 783 536**	**11 229 604**	**11 675 672**	**12 121 739**	**12 567 807**	**13 013 875**	**13 459 943**	**13 906 010**	**14 352 078**	**14 798 146**
Target Sysem Input Volume			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**40 844 672**	**40 398 604**	**39 952 536**	**39 506 469**	**39 060 401**	**38 614 333**	**38 168 265**	**37 722 198**	**37 276 130**	**36 830 062**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**21%**	**22%**	**23%**	**23%**	**24%**	**25%**	**26%**	**27%**	**28%**	**29%**
% return flow			m3/annum	58%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
Return flow			m3/annum	30 000 000	24 774 444	24 774 444	24 774 444	24 774 444	24 774 444	24 506 803	24 239 162	23 971 522	23 703 881	23 436 241	23 168 600	22 900 959	22 633 319	22 365 678	22 098 037
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	30%	m3/annum	0	254 566	509 131	763 697	1 018 263	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829
Mains replacement	Replace _% per annum, Saving 200l/km/h	10%	m3/annum	102 317	204 634	306 950	409 267	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	125 583	251 167	376 750	502 333	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	20	m3/annum	0	893 900	1 787 801	2 681 701	3 575 602	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502
Water Wise Gardening	Reduce billed consumption by _% for 1/3	10%	m3/annum	0	185 862	371 723	557 585	743 446	929 308	910 722	892 135	873 549	854 963	836 377	817 791	799 205	780 619	762 032	743 446
Total direct interventions			**m3/annum**	**227 900**	**1 790 128**	**3 352 356**	**4 914 584**	**6 476 812**	**7 811 139**	**7 792 553**	**7 773 967**	**7 755 381**	**7 736 795**	**7 718 208**	**7 699 622**	**7 681 036**	**7 662 450**	**7 643 864**	**7 625 278**
Indirect measureable interventions																			
Sectorisation																			
Tariff structures																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	0.0%	1.0%	2.0%	2.9%	3.9%	4.4%	5.8%	6.7%	7.6%	8.5%	9.4%	10.3%	11.2%	12.1%	13.0%	13.9%
Total indirect interventions			**m3/annum**	**0**	**505 266**	**1 010 532**	**1 515 798**	**2 021 063**	**2 273 696**	**2 990 983**	**3 455 637**	**3 920 291**	**4 384 945**	**4 849 599**	**5 314 253**	**5 778 906**	**6 243 560**	**6 708 214**	**7 172 868**
Total estimated savings			**m3/annum**	**227 900**	**2 295 394**	**4 362 888**	**6 430 381**	**8 497 875**	**10 084 836**	**10 783 536**	**11 229 604**	**11 675 672**	**12 121 739**	**12 567 807**	**13 013 875**	**13 459 943**	**13 906 010**	**14 352 078**	**14 798 146**
System Input Volume with WCWDM			**m3/annum**	**51 400 308**	**49 332 814**	**47 265 320**	**45 197 827**	**43 130 333**	**41 543 372**	**40 844 672**	**40 398 604**	**39 952 536**	**39 506 469**	**39 060 401**	**38 614 333**	**38 168 265**	**37 722 198**	**37 276 130**	**36 830 062**
% Reduction			**%**	**0%**	**4%**	**8%**	**12%**	**16%**	**20%**	**21%**	**22%**	**23%**	**23%**	**24%**	**25%**	**26%**	**27%**	**28%**	**29%**
Meter reading, billing & cost recovery			**m3/annum**	**0**	**1 032 564**	**2 065 128**	**3 097 692**	**4 130 257**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**
Water Use Efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**546 433**	**1 070 563**	**1 572 389**	**2 051 911**	**2 509 131**	**2 944 047**	**3 356 660**	**3 746 969**	**4 114 975**	**4 460 677**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000
		OPEX	Rands	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000
Pressure management		CAPEX	Rands		1 000 000	1 000 000	1 000 000	1 000 000	1 000 000										
		OPEX	Rands	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands		3 724 585	3 724 585	3 724 585	3 724 585	3 724 585										
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands																
	R 5 / consumer / month	OPEX	Rands	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands		200 000	200 000	200 000	200 000	200 000										
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands		3 724 585	3 724 585	3 724 585	3 724 585	3 724 585										
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening	R 2000 per customer	CAPEX	Rands		9 311 463	9 311 463	9 311 463	9 311 463	9 311 463										
		OPEX	Rands	0															
TOTAL COSTS		**CAPEX**	Rands	**2 274 294**	**20 234 927**	**20 234 927**	**20 234 927**	**20 234 927**	**20 234 927**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**
		OPEX	Rands	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**
		TOTAL	Rands	**10 313 172**	**28 273 805**	**28 273 805**	**28 273 805**	**28 273 805**	**28 273 805**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**
		REDUCED PAYMENT		**683 700**	**6 886 182**	**13 088 663**	**19 291 144**	**25 493 625**	**30 254 507**	**32 350 609**	**33 688 812**	**35 027 015**	**36 365 218**	**37 703 421**	**39 041 625**	**40 379 828**	**41 718 031**	**43 056 234**	**44 394 437**
		ADDITIONAL INCOME		**6 195 385**	**12 390 770**	**18 586 155**	**24 781 540**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**
		CBR		**15.08**	**4.11**	**2.16**	**1.47**	**1.11**	**0.93**	**0.49**	**0.47**	**0.45**	**0.44**	**0.42**	**0.41**	**0.39**	**0.38**	**0.37**	**0.36**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality			Unit	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**
Billed consumption			m3/annum	21 606 405	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	21 606 405	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424
Unbilled potential paid consumption	% of system input volume	10.0%	m3/annum	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851
Total potential revenue water		67%	**m3/annum**	**28 110 076**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**
Non-revenue water			**m3/annum**	**23 518 132**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**
Unbilled consumption	% of system input volume	1%	m3/annum	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282
Apparent losses		20%	m3/annum	4 703 626	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022
Unavoidable annual real losses		2.0	m3/annum	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493
% inefficient use reduction			%	23%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Potential saving (Real losses)			**m3/annum**	**15 355 730**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**
Target Sysem Input Volume			**m3/annum**	**36 272 478**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**
% Reduction			**%**	**30%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**
% return flow			m3/annum	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
Return flow			m3/annum	21 763 487	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	30%	m3/annum	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829
Mains replacement	Replace _% per annum, Saving 200l/km/h	10%	m3/annum	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	20	m3/annum	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502
Water Wise Gardening	Reduce billed consumption by _% for 1/3	10%	m3/annum	720 214	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981
Total direct interventions			**m3/annum**	**7 602 045**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**
Indirect measureable interventions																			
Sectorisation																			
Tariff structures																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	15.0%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%
Total indirect interventions			**m3/annum**	**7 753 685**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**
Total estimated savings			**m3/annum**	**15 355 730**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**
System Input Volume with WCWDM			**m3/annum**	**36 272 478**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**
% Reduction			**%**	**30%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**
Meter reading, billing & cost recovery			**m3/annum**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**
Water Use Efficiency			**m3/annum**	**4 861 441**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000
		OPEX	Rands	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000
Pressure management		CAPEX	Rands																
		OPEX	Rands	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands																
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands																
	R 5 / consumer / month	OPEX	Rands	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening	R 2000 per customer	CAPEX	Rands																
		OPEX	Rands																
TOTAL COSTS		**CAPEX**	Rands	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**
		OPEX	Rands	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**
		TOTAL	Rands	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**
		REDUCED PAYMENT		**46 067 191**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**
		ADDITIONAL INCOME		**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**
		CBR		**0.35**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
System input volume without WCWDM			**m3/annum**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**2 374 897 568**	**51 628 208**
Billed consumption			m3/annum	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	1 043 380 270	22 682 180
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	20 909 424	1 043 380 270	22 682 180
Unbilled potential paid consumption	% of system input volume	10.0%	m3/annum	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	237 489 757	5 162 821
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	61 679 129	1 340 851
Total potential revenue water		67%	**m3/annum**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**27 413 096**	**1 342 549 155**	**29 185 851**
Non-revenue water			**m3/annum**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**24 215 112**	**1 032 348 413**	**22 442 357**
Unbilled consumption	% of system input volume	1%	m3/annum	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	23 748 976	516 282
Apparent losses		20%	m3/annum	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	4 843 022	206 469 683	4 488 471
Unavoidable annual real losses		2.0	m3/annum	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	135 354 667	2 942 493
% inefficient use reduction			%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%		
Potential saving (Real losses)			**m3/annum**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**666 775 088**	**14 495 111**
Target Sysem Input Volume			**m3/annum**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**1 708 122 480**	**37 133 097**
% Reduction			**%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**28%**	**28%**
% return flow			m3/annum	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	43%	43%
Return flow			m3/annum	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	21 428 936	1 030 099 045	22 393 457
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	30%	m3/annum	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	54 731 632	1 189 818
Mains replacement	Replace _% per annum, Saving 200l/km/h	10%	m3/annum	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	22 509 696	489 341
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	27 628 339	600 616
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	20	m3/annum	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	192 188 589	4 178 013
Water Wise Gardening	Reduce billed consumption by _% for 1/3	10%	m3/annum	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	696 981	31 991 419	695 466
Total direct interventions			**m3/annum**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**7 578 812**	**329 049 676**	**7 153 254**
Indirect measureable interventions																			
Sectorisation																			
Tariff structures																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	16.1%	13%	13%
Total indirect interventions			**m3/annum**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**8 334 503**	**307 599 874**	**6 686 954**
Total estimated savings			**m3/annum**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**15 913 315**	**636 649 550**	**13 840 208**
System Input Volume with WCWDM			**m3/annum**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**35 714 893**	**1 738 248 018**	**37 788 000**
% Reduction			**%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**31%**	**27%**	**27%**
Meter reading, billing & cost recovery			**m3/annum**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**222 001 294**	**4 826 115**
Water Use Efficiency			**m3/annum**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**5 227 356**	**182 828 521**	**3 974 533**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	**3 680 000**	**80 000**
		OPEX	Rands	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	**4 600 000**	**100 000**
Pressure management		CAPEX	Rands															**5 000 000**	**1 000 000**
		OPEX	Rands	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	**9 200 000**	**200 000**
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	**80 592 000**	**1 752 000**
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	**80 592 000**	**1 752 000**
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands															**18 622 925**	**3 724 585**
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	**20 345 546**	**442 294**
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Education and awareness campaigns		CAPEX	Rands																
	R 5 / consumer / month	OPEX	Rands	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	11 173 755	**480 471 474**	**10 445 032**
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	**16 560 000**	**360 000**
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands															**1 000 000**	**200 000**
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	**1 840 000**	**40 000**
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands															**18 622 925**	**3 724 585**
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Water Wise Gardening	R 2000 per customer	CAPEX	Rands															**46 557 313**	**9 311 463**
		OPEX	Rands															**0**	**0**
TOTAL COSTS		**CAPEX**	Rands	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**194 420 710**	**4 226 537**
		OPEX	Rands	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**13 625 755**	**593 263 474**	**12 897 032**
		TOTAL	Rands	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**15 900 050**	**787 684 183**	**17 123 569**
		REDUCED PAYMENT		**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**47 739 945**	**1 909 948 650**	**41 520 623**
		ADDITIONAL INCOME		**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**1 362 984 691**	**29 630 102**
		CBR		**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**0.41**	**0.41**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			6%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Sectorisation		CAPEX	Rands	80 000	75 472	71 200	67 170	63 367	59 781	56 397	53 205	50 193	47 352	44 672	42 143	39 758	37 507	35 384	33 381
		OPEX	Rands	100 000	94 340	89 000	83 962	79 209	74 726	70 496	66 506	62 741	59 190	55 839	52 679	49 697	46 884	44 230	41 727
Pressure management		CAPEX	Rands	0	943 396	889 996	839 619	792 094	747 258	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	200 000	188 679	177 999	167 924	158 419	149 452	140 992	133 011	125 482	118 380	111 679	105 358	99 394	93 768	88 460	83 453
Mains replacement		CAPEX	Rands	1 752 000	1 652 830	1 559 274	1 471 013	1 387 748	1 309 196	1 235 091	1 165 180	1 099 226	1 037 006	978 308	922 932	870 690	821 406	774 911	731 048
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 752 000	1 652 830	1 559 274	1 471 013	1 387 748	1 309 196	1 235 091	1 165 180	1 099 226	1 037 006	978 308	922 932	870 690	821 406	774 911	731 048
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	3 513 759	3 314 867	3 127 233	2 950 220	2 783 227	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	442 294	417 259	393 641	371 359	350 339	330 508	311 800	294 151	277 501	261 793	246 975	232 995	219 807	207 365	195 627	184 554
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	5 586 878	5 270 639	4 972 301	4 690 850	4 425 330	4 174 840	7 877 057	7 431 185	7 010 552	6 613 729	6 239 367	5 886 195	5 553 014	5 238 692	4 942 163	4 662 418
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	360 000	339 623	320 399	302 263	285 154	269 013	253 786	239 421	225 868	213 083	201 022	189 644	178 909	168 782	159 228	150 215
Management meters		CAPEX	Rands	0	188 679	177 999	167 924	158 419	149 452	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	40 000	37 736	35 600	33 585	31 684	29 890	28 198	26 602	25 096	23 676	22 336	21 072	19 879	18 754	17 692	16 691
Consumer meters		CAPEX	Rands	0	3 513 759	3 314 867	3 127 233	2 950 220	2 783 227	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands		8 784 399	8 287 169	7 818 084	7 375 551	6 958 067	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**2 274 294**	**19 089 554**	**18 009 013**	**16 989 635**	**16 027 958**	**15 120 715**	**1 603 288**	**1 512 536**	**1 426 920**	**1 346 151**	**1 269 954**	**1 198 070**	**1 130 255**	**1 066 278**	**1 005 923**	**948 984**
		OPEX		**8 038 878**	**7 583 847**	**7 154 572**	**6 749 597**	**6 367 544**	**6 007 117**	**9 605 620**	**9 061 905**	**8 548 967**	**8 065 064**	**7 608 551**	**7 177 878**	**6 771 583**	**6 388 286**	**6 026 685**	**5 685 552**
		TOTAL		**10 313 172**	**26 673 401**	**25 163 586**	**23 739 232**	**22 395 502**	**21 127 832**	**11 208 908**	**10 574 441**	**9 975 888**	**9 411 215**	**8 878 505**	**8 375 948**	**7 901 838**	**7 454 564**	**7 032 607**	**6 634 535**
		REDUCED PAYMENT		**683 700**	**6 496 398**	**11 648 863**	**16 197 216**	**20 193 339**	**22 607 928**	**22 805 903**	**22 404 984**	**21 976 383**	**21 524 517**	**21 053 394**	**20 566 641**	**20 067 537**	**19 559 041**	**19 043 814**	**18 524 248**
		ADDITIONAL INCOME		**6 195 385**	**11 689 406**	**16 541 612**	**20 807 059**	**24 536 626**	**23 147 760**	**21 837 510**	**20 601 424**	**19 435 306**	**18 335 194**	**17 297 353**	**16 318 258**	**15 394 583**	**14 523 191**	**13 701 124**	**12 925 588**

			6%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Pressure management			m3/annum	0	240 156	453 125	641 215	806 560	951 132	897 294	846 504	798 588	753 385	710 741	670 510	632 557	596 752	562 973	531 107
Mains replacement			m3/annum	102 317	193 051	273 185	343 629	405 222	382 285	360 647	340 233	320 974	302 806	285 666	269 496	254 242	239 851	226 274	213 466
Active and passive leakage control			m3/annum	125 583	236 950	335 306	421 769	497 369	469 216	442 657	417 601	393 963	371 663	350 625	330 779	312 055	294 392	277 728	262 008
Retrofitting & removal of wasteful devices			m3/annum	0	843 302	1 591 136	2 251 608	2 832 211	3 339 872	3 150 823	2 972 474	2 804 221	2 645 491	2 495 747	2 354 478	2 221 206	2 095 477	1 976 865	1 864 967
Water Wise Gardening			m3/annum	0	175 341	330 832	468 159	588 879	694 433	642 023	593 321	548 076	506 051	467 029	430 802	397 180	365 984	337 048	310 214
Meter reading, billing & cost recovery			m3/annum	0	974 117	1 837 957	2 600 882	3 271 550	3 857 960	3 639 585	3 433 571	3 239 218	3 055 866	2 882 892	2 719 710	2 565 764	2 420 532	2 283 521	2 154 265
Water Use Efficiency			m3/annum	0	0	0	0	0	0	385 214	711 985	986 536	1 214 523	1 401 086	1 550 887	1 668 157	1 756 725	1 820 057	1 861 285
Other			m3/annum	0	476 666	899 370	1 272 693	1 600 872	1 699 038	2 108 525	2 298 196	2 459 639	2 595 442	2 707 991	2 799 482	2 871 939	2 927 225	2 967 050	2 992 987
Total			**m3/annum**	**227 900**	**3 139 583**	**5 720 911**	**7 999 954**	**10 002 663**	**11 393 936**	**11 626 766**	**11 613 884**	**11 551 215**	**11 445 228**	**11 301 776**	**11 126 144**	**10 923 100**	**10 696 937**	**10 451 516**	**10 190 299**

Unit reference values

All interventions				**45.3**	**8.5**	**4.4**	**3.0**	**2.2**	**1.9**	**1.0**	**0.9**	**0.9**	**0.8**	**0.8**	**0.8**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					4.7	2.4	1.6	1.2	0.9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				14.0	7.0	4.7	3.5	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					4.2	2.1	1.4	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					50.1	25.0	16.7	12.5	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					4.0	2.0	1.3	1.0	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management					3.1	1.5	1.0	0.8	0.7	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Awareness campaigns & Efficiency					22.1	11.1	7.4	5.5	4.9	5.5	4.0	3.2	2.6	2.3	2.0	1.8	1.6	1.5	1.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			6%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**
Sectorisation		CAPEX	Rands	31 492	29 709	28 028	26 441	24 944	23 532	22 200	20 944	19 758	18 640	17 585	16 589	15 650	14 765	13 929	13 140
		OPEX	Rands	39 365	37 136	35 034	33 051	31 180	29 416	27 751	26 180	24 698	23 300	21 981	20 737	19 563	18 456	17 411	16 425
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	78 729	74 273	70 069	66 103	62 361	58 831	55 501	52 359	49 396	46 600	43 962	41 474	39 126	36 911	34 822	32 851
Mains replacement		CAPEX	Rands	689 668	650 630	613 802	579 059	546 282	515 360	486 189	458 669	432 706	408 214	385 107	363 309	342 744	323 343	305 041	287 774
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	689 668	650 630	613 802	579 059	546 282	515 360	486 189	458 669	432 706	408 214	385 107	363 309	342 744	323 343	305 041	287 774
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	174 108	164 252	154 955	146 184	137 910	130 103	122 739	115 791	109 237	103 054	97 221	91 718	86 526	81 628	77 008	72 649
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	4 398 507	4 149 535	3 914 656	3 693 071	3 484 030	3 286 820	3 100 774	2 925 259	2 759 678	2 603 470	2 456 103	2 317 079	2 185 923	2 062 192	1 945 464	1 835 343
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	141 713	133 691	126 124	118 985	112 250	105 896	99 902	94 247	88 912	83 880	79 132	74 652	70 427	66 440	62 680	59 132
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	15 746	14 855	14 014	13 221	12 472	11 766	11 100	10 472	9 879	9 320	8 792	8 295	7 825	7 382	6 964	6 570
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**895 268**	**844 592**	**796 785**	**751 684**	**709 136**	**668 996**	**631 128**	**595 404**	**561 702**	**529 907**	**499 913**	**471 616**	**444 921**	**419 736**	**395 978**	**373 564**
		OPEX		**5 363 728**	**5 060 121**	**4 773 699**	**4 503 489**	**4 248 575**	**4 008 090**	**3 781 217**	**3 567 185**	**3 365 269**	**3 174 782**	**2 995 078**	**2 825 545**	**2 665 608**	**2 514 725**	**2 372 382**	**2 238 096**
		TOTAL		**6 258 995**	**5 904 713**	**5 570 484**	**5 255 173**	**4 957 711**	**4 677 086**	**4 412 345**	**4 162 589**	**3 926 971**	**3 704 690**	**3 494 990**	**3 297 161**	**3 110 529**	**2 934 461**	**2 768 360**	**2 611 660**
		REDUCED PAYMENT		**18 134 179**	**17 728 917**	**16 725 393**	**15 778 673**	**14 885 541**	**14 042 963**	**13 248 078**	**12 498 187**	**11 790 742**	**11 123 342**	**10 493 719**	**9 899 735**	**9 339 372**	**8 810 729**	**8 312 008**	**7 841 517**
		ADDITIONAL INCOME		**12 193 951**	**11 503 728**	**10 852 573**	**10 238 277**	**9 658 752**	**9 112 030**	**8 596 255**	**8 109 674**	**7 650 636**	**7 217 581**	**6 809 039**	**6 423 621**	**6 060 020**	**5 717 000**	**5 393 396**	**5 088 110**

			6%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**
Pressure management			m3/annum	501 044	472 683	445 928	420 686	396 874	374 409	353 216	333 223	314 361	296 567	279 781	263 944	249 004	234 909	221 612	209 068
Mains replacement			m3/annum	201 383	189 984	179 230	169 085	159 514	150 485	141 967	133 931	126 350	119 198	112 451	106 086	100 081	94 416	89 072	84 030
Active and passive leakage control			m3/annum	247 177	233 186	219 987	207 535	195 787	184 705	174 250	164 387	155 082	146 304	138 022	130 210	122 839	115 886	109 327	103 138
Retrofitting & removal of wasteful devices			m3/annum	1 759 403	1 659 814	1 565 862	1 477 229	1 393 612	1 314 728	1 240 310	1 170 103	1 103 871	1 041 388	982 441	926 831	874 369	824 877	778 186	734 137
Water Wise Gardening			m3/annum	283 509	258 834	244 183	230 361	217 322	205 021	193 416	182 468	172 139	162 396	153 203	144 531	136 350	128 633	121 351	114 482
Meter reading, billing & cost recovery			m3/annum	2 032 325	1 917 288	1 808 762	1 706 379	1 609 792	1 518 672	1 432 709	1 351 612	1 275 106	1 202 930	1 134 840	1 070 604	1 010 003	952 833	898 899	848 018
Water Use Efficiency			m3/annum	1 913 688	1 941 254	1 831 372	1 727 709	1 629 914	1 537 655	1 450 618	1 368 508	1 291 045	1 217 967	1 149 025	1 083 986	1 022 628	964 744	910 136	858 619
Other			m3/annum	3 052 209	3 095 138	2 919 941	2 754 662	2 598 737	2 451 639	2 312 867	2 181 950	2 058 443	1 941 928	1 832 007	1 728 309	1 630 480	1 538 189	1 451 121	1 368 982
Total			**m3/annum**	**9 990 740**	**9 768 181**	**9 215 265**	**8 693 646**	**8 201 553**	**7 737 314**	**7 299 353**	**6 886 182**	**6 496 398**	**6 128 678**	**5 781 771**	**5 454 501**	**5 145 756**	**4 854 487**	**4 579 704**	**4 320 476**

Unit reference values																			
All interventions				**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Awareness campaigns & Efficiency				1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			6%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present cost			**Unit**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**Total**	**Average**
Sectorisation		CAPEX	Rands	12 397	11 695	11 033	10 408	9 819	9 263	8 739	8 244	7 778	7 338	6 922	6 530	6 161	5 812	1 316 467	28 619
		OPEX	Rands	15 496	14 619	13 791	13 011	12 274	11 579	10 924	10 306	9 722	9 172	8 653	8 163	7 701	7 265	1 645 583	35 774
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4 212 364	91 573
		OPEX	Rands	30 991	29 237	27 582	26 021	24 548	23 159	21 848	20 611	19 444	18 344	17 305	16 326	15 402	14 530	3 291 166	71 547
Mains replacement		CAPEX	Rands	271 485	256 118	241 621	227 944	215 042	202 870	191 386	180 553	170 333	160 692	151 596	143 015	134 920	127 283	28 830 618	626 753
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	271 485	256 118	241 621	227 944	215 042	202 870	191 386	180 553	170 333	160 692	151 596	143 015	134 920	127 283	28 830 618	626 753
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15 689 307	341 072
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	68 537	64 657	60 998	57 545	54 288	51 215	48 316	45 581	43 001	40 567	38 271	36 104	34 061	32 133	7 278 324	158 224
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 731 456	1 633 449	1 540 990	1 453 764	1 371 475	1 293 845	1 220 608	1 151 517	1 086 337	1 024 846	966 836	912 109	860 481	811 774	154 752 601	3 364 187
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	55 785	52 627	49 648	46 838	44 187	41 686	39 326	37 100	35 000	33 019	31 150	29 387	27 723	26 154	5 924 100	128 785
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	842 473	18 315
		OPEX	Rands	6 198	5 847	5 516	5 204	4 910	4 632	4 370	4 122	3 889	3 669	3 461	3 265	3 080	2 906	658 233	14 309
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15 689 307	341 072
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39 223 268	871 628
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**352 419**	**332 471**	**313 651**	**295 898**	**279 149**	**263 348**	**248 441**	**234 379**	**221 112**	**208 596**	**196 789**	**185 650**	**175 141**	**165 228**	**113 082 127**	**2 458 307**
		OPEX		**2 111 412**	**1 991 898**	**1 879 149**	**1 772 782**	**1 672 436**	**1 577 770**	**1 488 462**	**1 404 209**	**1 324 726**	**1 249 741**	**1 179 001**	**1 112 265**	**1 049 307**	**989 912**	**195 102 301**	**4 241 354**
		TOTAL		**2 463 830**	**2 324 368**	**2 192 800**	**2 068 679**	**1 951 584**	**1 841 117**	**1 736 903**	**1 638 588**	**1 545 838**	**1 458 337**	**1 375 790**	**1 297 915**	**1 224 448**	**1 155 140**	**308 184 428**	**6 699 661**
		REDUCED PAYMENT		**7 397 658**	**6 978 922**	**6 583 889**	**6 211 216**	**5 859 638**	**5 527 960**	**5 215 057**	**4 919 865**	**4 641 382**	**4 378 662**	**4 130 813**	**3 896 994**	**3 676 409**	**3 468 311**	**558 893 773**	**12 149 865**
		ADDITIONAL INCOME		**4 800 104**	**4 528 400**	**4 272 075**	**4 030 260**	**3 802 132**	**3 586 917**	**3 383 884**	**3 192 343**	**3 011 644**	**2 841 174**	**2 680 353**	**2 528 635**	**2 385 504**	**2 250 476**	**451 205 919**	**9 808 824**

			6%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present saving			**Unit**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**Total**	**Average**
Pressure management			m3/annum	197 234	186 070	175 538	165 602	156 228	147 385	139 042	131 172	123 747	116 743	110 135	103 901	98 019	92 471	**17 403 196**	**378 330**
Mains replacement			m3/annum	79 274	74 787	70 553	66 560	62 792	59 238	55 885	52 722	49 737	46 922	44 266	41 760	39 397	37 167	**7 451 667**	**161 993**
Active and passive leakage control			m3/annum	97 300	91 793	86 597	81 695	77 071	72 708	68 593	64 710	61 047	57 592	54 332	51 257	48 355	45 618	**9 146 156**	**198 829**
Retrofitting & removal of wasteful devices			m3/annum	692 582	653 380	616 396	581 506	548 590	517 538	488 243	460 607	434 535	409 938	386 734	364 844	344 192	324 710	**61 110 835**	**1 328 496**
Water Wise Gardening			m3/annum	108 002	101 889	96 122	90 681	85 548	80 706	76 137	71 828	67 762	63 926	60 308	56 894	53 674	50 636	**10 867 684**	**236 254**
Meter reading, billing & cost recovery			m3/annum	800 017	754 733	712 013	671 710	633 689	597 819	563 981	532 057	501 941	473 529	446 725	421 439	397 584	375 079	**70 590 479**	**1 534 576**
Water Use Efficiency			m3/annum	810 017	764 167	720 913	680 106	641 610	605 292	571 030	538 708	508 215	479 448	452 310	426 707	402 554	379 768	**43 236 168**	**939 917**
Other			m3/annum	1 291 493	1 218 389	1 149 424	1 084 362	1 022 983	965 079	910 451	858 917	810 299	764 433	721 163	680 342	641 832	605 502	**80 318 386**	**1 746 052**
Total			**m3/annum**	**4 075 921**	**3 845 208**	**3 627 555**	**3 422 222**	**3 228 511**	**3 045 765**	**2 873 363**	**2 710 720**	**2 557 283**	**2 412 531**	**2 275 973**	**2 147 144**	**2 025 608**	**1 910 951**	**300 124 571**	**6 524 447**

Unit reference values

All interventions				**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**1.0**	**1.0**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.9	3.9
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.2	3.2
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	3.7
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3
Management				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3
Awareness campaigns & Efficiency				1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.9	1.9

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			8%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Sectorisation		CAPEX	Rands	80 000	74 074	68 587	63 507	58 802	54 447	50 414	46 679	43 222	40 020	37 055	34 311	31 769	29 416	27 237	25 219
		OPEX	Rands	100 000	92 593	85 734	79 383	73 503	68 058	63 017	58 349	54 027	50 025	46 319	42 888	39 711	36 770	34 046	31 524
Pressure management		CAPEX	Rands	0	925 926	857 339	793 832	735 030	680 583	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	200 000	185 185	171 468	158 766	147 006	136 117	126 034	116 698	108 054	100 050	92 639	85 777	79 423	73 540	68 092	63 048
Mains replacement		CAPEX	Rands	1 752 000	1 622 222	1 502 058	1 390 794	1 287 772	1 192 382	1 104 057	1 022 275	946 551	876 436	811 515	751 403	695 743	644 207	596 488	552 303
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 752 000	1 622 222	1 502 058	1 390 794	1 287 772	1 192 382	1 104 057	1 022 275	946 551	876 436	811 515	751 403	695 743	644 207	596 488	552 303
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	3 448 690	3 193 231	2 956 696	2 737 681	2 534 890	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	442 294	409 532	379 196	351 108	325 100	301 018	278 721	258 075	238 958	221 257	204 868	189 693	175 641	162 631	150 584	139 430
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	5 586 878	5 173 035	4 789 847	4 435 044	4 106 522	3 802 335	7 041 361	6 519 779	6 036 832	5 589 659	5 175 611	4 792 232	4 437 252	4 108 567	3 804 228	3 522 434
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	360 000	333 333	308 642	285 780	264 611	245 010	226 861	210 057	194 497	180 090	166 750	154 398	142 961	132 371	122 566	113 487
Management meters		CAPEX	Rands	0	185 185	171 468	158 766	147 006	136 117	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	40 000	37 037	34 294	31 753	29 401	27 223	25 207	23 340	21 611	20 010	18 528	17 155	15 885	14 708	13 618	12 610
Consumer meters		CAPEX	Rands	0	3 448 690	3 193 231	2 956 696	2 737 681	2 534 890	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands		8 621 725	7 983 078	7 391 739	6 844 203	6 337 225	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**2 274 294**	**18 736 044**	**17 348 189**	**16 063 138**	**14 873 276**	**13 771 551**	**1 433 191**	**1 327 029**	**1 228 731**	**1 137 713**	**1 053 438**	**975 406**	**903 154**	**836 253**	**774 309**	**716 952**
		OPEX		**8 038 878**	**7 443 405**	**6 892 042**	**6 381 520**	**5 908 815**	**5 471 125**	**8 586 537**	**7 950 497**	**7 361 572**	**6 816 270**	**6 311 361**	**5 843 853**	**5 410 975**	**5 010 162**	**4 639 039**	**4 295 406**
		TOTAL		**10 313 172**	**26 179 449**	**24 240 231**	**22 444 658**	**20 782 091**	**19 242 677**	**10 019 728**	**9 277 526**	**8 590 302**	**7 953 983**	**7 364 799**	**6 819 259**	**6 314 128**	**5 846 415**	**5 413 347**	**5 012 359**
		REDUCED PAYMENT		**683 700**	**6 376 094**	**11 221 419**	**15 313 932**	**18 738 575**	**20 590 709**	**20 386 371**	**19 657 098**	**18 924 006**	**18 191 663**	**17 463 979**	**16 744 284**	**16 035 385**	**15 339 633**	**14 658 970**	**13 994 978**
		ADDITIONAL INCOME		**6 195 385**	**11 472 935**	**15 934 632**	**19 672 385**	**22 768 964**	**21 082 375**	**19 520 717**	**18 074 738**	**16 735 869**	**15 496 175**	**14 348 310**	**13 285 472**	**12 301 363**	**11 390 151**	**10 546 436**	**9 765 219**

			8%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Pressure management			m3/annum	0	235 709	436 498	606 247	748 454	866 266	802 098	742 683	687 670	636 731	589 566	545 894	505 458	468 016	433 349	401 249
Mains replacement			m3/annum	102 317	189 476	263 160	324 889	376 030	348 175	322 385	298 504	276 393	255 919	236 962	219 410	203 157	188 108	174 174	161 273
Active and passive leakage control			m3/annum	125 583	232 562	323 002	398 768	461 538	427 350	395 694	366 383	339 244	314 115	290 847	269 303	249 354	230 884	213 781	197 946
Retrofitting & removal of wasteful devices			m3/annum	0	827 686	1 532 751	2 128 821	2 628 174	3 041 868	2 816 544	2 607 912	2 414 733	2 235 864	2 070 244	1 916 893	1 774 901	1 643 427	1 521 691	1 408 973
Water Wise Gardening			m3/annum	0	172 094	318 693	442 629	546 455	632 471	573 909	520 552	471 951	427 694	387 404	350 736	317 375	287 032	259 442	234 365
Meter reading, billing & cost recovery			m3/annum	0	956 078	1 770 515	2 459 048	3 035 862	3 513 729	3 253 453	3 012 456	2 789 311	2 582 696	2 391 385	2 214 245	2 050 227	1 898 358	1 757 739	1 627 536
Water Use Efficiency			m3/annum	0	0	0	0	0	0	344 345	624 663	849 513	1 026 467	1 162 213	1 262 651	1 332 976	1 377 753	1 400 989	1 406 191
Other			m3/annum	0	467 839	866 368	1 203 289	1 485 542	1 547 440	1 884 827	2 016 331	2 118 011	2 193 564	2 246 303	2 279 192	2 294 883	2 295 744	2 283 886	2 261 187
Total			**m3/annum**	**227 900**	**3 081 443**	**5 510 988**	**7 563 692**	**9 282 054**	**10 377 299**	**10 393 255**	**10 189 485**	**9 946 826**	**9 673 050**	**9 374 925**	**9 058 324**	**8 728 331**	**8 389 322**	**8 045 051**	**7 698 721**

Unit reference values

All interventions				**45.3**	**8.5**	**4.4**	**3.0**	**2.2**	**1.9**	**1.0**	**0.9**	**0.9**	**0.8**	**0.8**	**0.8**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					4.7	2.4	1.6	1.2	0.9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				14.0	7.0	4.7	3.5	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					4.2	2.1	1.4	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					50.1	25.0	16.7	12.5	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					4.0	2.0	1.3	1.0	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management					3.1	1.5	1.0	0.8	0.7	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Awareness campaigns & Efficiency					22.1	11.1	7.4	5.5	4.9	5.5	4.0	3.2	2.6	2.3	2.0	1.8	1.6	1.5	1.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			8%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**
Sectorisation		CAPEX	Rands	23 351	21 622	20 020	18 537	17 164	15 892	14 715	13 625	12 616	11 681	10 816	10 015	9 273	8 586	7 950	7 361
		OPEX	Rands	29 189	27 027	25 025	23 171	21 455	19 866	18 394	17 032	15 770	14 602	13 520	12 519	11 591	10 733	9 938	9 202
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	58 378	54 054	50 050	46 342	42 910	39 731	36 788	34 063	31 540	29 204	27 040	25 037	23 183	21 466	19 875	18 403
Mains replacement		CAPEX	Rands	511 392	473 511	438 436	405 960	375 888	348 045	322 264	298 392	276 289	255 823	236 873	219 327	203 081	188 038	174 109	161 212
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	511 392	473 511	438 436	405 960	375 888	348 045	322 264	298 392	276 289	255 823	236 873	219 327	203 081	188 038	174 109	161 212
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	129 102	119 538	110 684	102 485	94 893	87 864	81 356	75 330	69 750	64 583	59 799	55 369	51 268	47 470	43 954	40 698
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	3 261 513	3 019 919	2 796 221	2 589 094	2 397 309	2 219 731	2 055 306	1 903 061	1 762 094	1 631 568	1 510 711	1 398 807	1 295 192	1 199 251	1 110 418	1 028 165
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	105 081	97 297	90 090	83 416	77 237	71 516	66 219	61 314	56 772	52 566	48 673	45 067	41 729	38 638	35 776	33 126
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	11 676	10 811	10 010	9 268	8 582	7 946	7 358	6 813	6 308	5 841	5 408	5 007	4 637	4 293	3 975	3 681
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**663 845**	**614 671**	**569 140**	**526 981**	**487 946**	**451 802**	**418 335**	**387 347**	**358 655**	**332 088**	**307 489**	**284 712**	**263 622**	**244 094**	**226 013**	**209 272**
		OPEX		**3 977 228**	**3 682 619**	**3 409 832**	**3 157 252**	**2 923 381**	**2 706 835**	**2 506 328**	**2 320 674**	**2 148 773**	**1 989 604**	**1 842 226**	**1 705 765**	**1 579 412**	**1 462 419**	**1 354 091**	**1 253 788**
		TOTAL		**4 641 073**	**4 297 290**	**3 978 972**	**3 684 233**	**3 411 327**	**3 158 636**	**2 924 663**	**2 708 021**	**2 507 427**	**2 321 692**	**2 149 715**	**1 990 477**	**1 843 034**	**1 706 513**	**1 580 105**	**1 463 060**
		REDUCED PAYMENT		**13 446 574**	**12 902 625**	**11 946 875**	**11 061 921**	**10 242 520**	**9 483 814**	**8 781 310**	**8 130 842**	**7 528 558**	**6 970 887**	**6 454 525**	**5 976 412**	**5 533 715**	**5 123 810**	**4 744 268**	**4 392 841**
		ADDITIONAL INCOME		**9 041 869**	**8 372 101**	**7 751 945**	**7 177 727**	**6 646 044**	**6 153 744**	**5 697 911**	**5 275 844**	**4 885 041**	**4 523 186**	**4 188 135**	**3 877 903**	**3 590 651**	**3 324 676**	**3 078 404**	**2 850 374**

			8%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**
Pressure management			m3/annum	371 527	344 006	318 524	294 930	273 083	252 855	234 125	216 782	200 724	185 856	172 089	159 341	147 538	136 610	126 490	117 121
Mains replacement			m3/annum	149 326	138 265	128 023	118 540	109 759	101 629	94 101	87 131	80 676	74 700	69 167	64 044	59 300	54 907	50 840	47 074
Active and passive leakage control			m3/annum	183 283	169 706	157 136	145 496	134 718	124 739	115 499	106 944	99 022	91 687	84 895	78 607	72 784	67 393	62 401	57 778
Retrofitting & removal of wasteful devices			m3/annum	1 304 605	1 207 968	1 118 489	1 035 638	958 924	887 892	822 122	761 225	704 838	652 627	604 285	559 523	518 077	479 701	444 167	411 266
Water Wise Gardening			m3/annum	210 223	188 372	174 419	161 499	149 536	138 459	128 203	118 706	109 913	101 772	94 233	87 253	80 790	74 805	69 264	64 133
Meter reading, billing & cost recovery			m3/annum	1 506 978	1 395 350	1 291 991	1 196 288	1 107 674	1 025 624	949 652	879 307	814 173	753 864	698 022	646 317	598 442	554 113	513 067	475 062
Water Use Efficiency			m3/annum	1 419 008	1 412 792	1 308 141	1 211 241	1 121 520	1 038 444	961 523	890 299	824 351	763 288	706 748	654 396	605 922	561 039	519 481	481 001
Other			m3/annum	2 263 227	2 252 557	2 085 701	1 931 205	1 788 153	1 655 697	1 533 053	1 419 493	1 314 346	1 216 987	1 126 839	1 043 370	966 083	894 521	828 261	766 908
Total			**m3/annum**	**7 408 178**	**7 109 017**	**6 582 423**	**6 094 836**	**5 643 367**	**5 225 340**	**4 838 278**	**4 479 887**	**4 148 043**	**3 840 781**	**3 556 278**	**3 292 850**	**3 048 936**	**2 823 089**	**2 613 971**	**2 420 343**

Unit reference values																			
All interventions				**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Awareness campaigns & Efficiency				1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			8%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present cost			**Unit**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**Total**	**Average**
Sectorisation		CAPEX	Rands	6 816	6 311	5 844	5 411	5 010	4 639	4 295	3 977	3 682	3 410	3 157	2 923	2 707	2 506	1 048 672	22 797
		OPEX	Rands	8 520	7 889	7 305	6 763	6 262	5 799	5 369	4 971	4 603	4 262	3 946	3 654	3 383	3 133	1 310 840	28 497
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 992 710	86 798
		OPEX	Rands	17 040	15 778	14 609	13 527	12 525	11 597	10 738	9 943	9 206	8 524	7 893	7 308	6 767	6 266	2 621 680	56 993
Mains replacement		CAPEX	Rands	149 270	138 213	127 975	118 496	109 718	101 591	94 066	87 098	80 646	74 672	69 141	64 020	59 277	54 886	22 965 919	499 259
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	149 270	138 213	127 975	118 496	109 718	101 591	94 066	87 098	80 646	74 672	69 141	64 020	59 277	54 886	22 965 919	499 259
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 871 188	323 287
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	37 684	34 892	32 308	29 914	27 699	25 647	23 747	21 988	20 359	18 851	17 455	16 162	14 965	13 856	5 797 774	126 039
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	952 004	881 486	816 190	755 732	699 752	647 918	599 924	555 485	514 338	476 239	440 962	408 298	378 054	350 050	118 576 410	2 577 748
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	30 672	28 400	26 296	24 348	22 545	20 875	19 329	17 897	16 571	15 344	14 207	13 155	12 180	11 278	4 719 025	102 587
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	798 542	17 360
		OPEX	Rands	3 408	3 156	2 922	2 705	2 505	2 319	2 148	1 989	1 841	1 705	1 579	1 462	1 353	1 253	524 336	11 399
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 871 188	323 287
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37 177 970	826 177
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**193 770**	**179 417**	**166 127**	**153 821**	**142 427**	**131 877**	**122 108**	**113 063**	**104 688**	**96 933**	**89 753**	**83 105**	**76 949**	**71 249**	**101 523 964**	**2 207 043**
		OPEX		**1 160 915**	**1 074 921**	**995 297**	**921 572**	**853 307**	**790 099**	**731 573**	**677 383**	**627 206**	**580 747**	**537 728**	**497 897**	**461 015**	**426 866**	**150 718 210**	**3 276 483**
		TOTAL		**1 354 685**	**1 254 338**	**1 161 424**	**1 075 393**	**995 734**	**921 976**	**853 681**	**790 446**	**731 894**	**677 680**	**627 481**	**581 001**	**537 964**	**498 115**	**252 242 174**	**5 483 526**
		REDUCED PAYMENT		**4 067 445**	**3 766 153**	**3 487 179**	**3 228 869**	**2 989 694**	**2 768 235**	**2 563 181**	**2 373 315**	**2 197 514**	**2 034 735**	**1 884 014**	**1 744 458**	**1 615 239**	**1 495 591**	**413 257 918**	**8 983 868**
		ADDITIONAL INCOME		**2 639 235**	**2 443 736**	**2 262 719**	**2 095 110**	**1 939 917**	**1 796 219**	**1 663 166**	**1 539 969**	**1 425 897**	**1 320 275**	**1 222 477**	**1 131 923**	**1 048 077**	**970 441**	**348 525 841**	**7 576 649**

			8%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present saving			**Unit**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**Total**	**Average**
Pressure management			m3/annum	108 445	100 412	92 974	86 087	79 710	73 806	68 339	63 277	58 589	54 250	50 231	46 510	43 065	39 875	**13 223 059**	**287 458**
Mains replacement			m3/annum	43 587	40 358	37 369	34 601	32 038	29 665	27 467	25 433	23 549	21 804	20 189	18 694	17 309	16 027	**5 755 905**	**125 128**
Active and passive leakage control			m3/annum	53 499	49 536	45 866	42 469	39 323	36 410	33 713	31 216	28 904	26 763	24 780	22 945	21 245	19 671	**7 064 782**	**153 582**
Retrofitting & removal of wasteful devices			m3/annum	380 802	352 594	326 476	302 293	279 901	259 167	239 970	222 194	205 735	190 496	176 385	163 319	151 222	140 020	**46 432 399**	**1 009 400**
Water Wise Gardening			m3/annum	59 383	54 984	50 911	47 140	43 648	40 415	37 421	34 649	32 083	29 706	27 506	25 468	23 582	21 835	**8 423 117**	**183 111**
Meter reading, billing & cost recovery			m3/annum	439 873	407 289	377 120	349 185	323 319	299 370	277 194	256 661	237 649	220 046	203 746	188 654	174 679	161 740	**53 635 092**	**1 165 980**
Water Use Efficiency			m3/annum	445 371	412 381	381 834	353 550	327 361	303 112	280 659	259 870	240 620	222 796	206 293	191 012	176 863	163 762	**29 232 437**	**635 488**
Other			m3/annum	710 100	657 500	608 796	563 700	521 945	483 282	447 483	414 337	383 645	355 227	328 914	304 550	281 990	261 102	**56 853 377**	**1 235 943**
Total			**m3/annum**	**2 241 059**	**2 075 054**	**1 921 347**	**1 779 025**	**1 647 245**	**1 525 227**	**1 412 247**	**1 307 636**	**1 210 774**	**1 121 087**	**1 038 044**	**961 152**	**889 955**	**824 033**	**220 620 168**	**4 796 091**

Unit reference values																			
All interventions				**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**1.1**	**1.1**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.5
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.0	4.0
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.3	3.3
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	4.5
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.4
Management				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3
Awareness campaigns & Efficiency				1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	2.1	2.1

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Sectorisation		CAPEX	Rands	80 000	72 727	66 116	60 105	54 641	49 674	45 158	41 053	37 321	33 928	30 843	28 040	25 490	23 173	21 067	19 151
		OPEX	Rands	100 000	90 909	82 645	75 131	68 301	62 092	56 447	51 316	46 651	42 410	38 554	35 049	31 863	28 966	26 333	23 939
Pressure management		CAPEX	Rands	0	909 091	826 446	751 315	683 013	620 921	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	200 000	181 818	165 289	150 263	136 603	124 184	112 895	102 632	93 301	84 820	77 109	70 099	63 726	57 933	52 666	47 878
Mains replacement		CAPEX	Rands	1 752 000	1 592 727	1 447 934	1 316 304	1 196 640	1 087 854	988 958	899 053	817 321	743 019	675 472	614 065	558 241	507 492	461 356	419 415
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 752 000	1 592 727	1 447 934	1 316 304	1 196 640	1 087 854	988 958	899 053	817 321	743 019	675 472	614 065	558 241	507 492	461 356	419 415
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	3 385 986	3 078 169	2 798 336	2 543 942	2 312 674	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	442 294	402 086	365 533	332 302	302 093	274 630	249 664	226 967	206 334	187 576	170 524	155 022	140 929	128 117	116 470	105 882
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	5 586 878	5 078 980	4 617 254	4 197 504	3 815 913	3 469 011	6 307 294	5 733 903	5 212 639	4 738 763	4 307 966	3 916 333	3 560 303	3 236 639	2 942 399	2 674 908
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	360 000	327 273	297 521	270 473	245 885	223 532	203 211	184 737	167 943	152 675	138 796	126 178	114 707	104 279	94 799	86 181
Management meters		CAPEX	Rands	0	181 818	165 289	150 263	136 603	124 184	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	40 000	36 364	33 058	30 053	27 321	24 837	22 579	20 526	18 660	16 964	15 422	14 020	12 745	11 587	10 533	9 576
Consumer meters		CAPEX	Rands	0	3 385 986	3 078 169	2 798 336	2 543 942	2 312 674	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands		8 464 966	7 695 424	6 995 840	6 359 854	5 781 686	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**2 274 294**	**18 395 388**	**16 723 080**	**15 202 800**	**13 820 728**	**12 564 298**	**1 283 780**	**1 167 073**	**1 060 975**	**964 523**	**876 839**	**797 126**	**724 660**	**658 782**	**598 893**	**544 448**
		OPEX		**8 038 878**	**7 308 071**	**6 643 700**	**6 039 728**	**5 490 662**	**4 991 511**	**7 691 384**	**6 992 167**	**6 356 515**	**5 778 650**	**5 253 318**	**4 775 744**	**4 341 586**	**3 946 896**	**3 588 087**	**3 261 897**
		TOTAL		**10 313 172**	**25 703 459**	**23 366 781**	**21 242 528**	**19 311 389**	**17 555 808**	**8 975 164**	**8 159 240**	**7 417 491**	**6 743 173**	**6 130 157**	**5 572 870**	**5 066 246**	**4 605 678**	**4 186 980**	**3 806 345**
		REDUCED PAYMENT		**683 700**	**6 260 165**	**10 817 077**	**14 493 722**	**17 412 489**	**18 785 668**	**18 261 075**	**17 287 687**	**16 340 361**	**15 422 402**	**14 536 301**	**13 683 851**	**12 866 258**	**12 084 228**	**11 338 052**	**10 627 675**
		ADDITIONAL INCOME		**6 195 385**	**11 264 336**	**15 360 459**	**18 618 738**	**21 157 656**	**19 234 233**	**17 485 666**	**15 896 060**	**14 450 964**	**13 137 240**	**11 942 945**	**10 857 223**	**9 870 203**	**8 972 912**	**8 157 192**	**7 415 630**

			10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving			**Unit**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Pressure management			m3/annum	0	231 423	420 770	573 777	695 487	790 326	718 479	653 162	593 784	539 804	490 731	446 119	405 562	368 693	335 176	304 705
Mains replacement			m3/annum	102 317	186 031	253 678	307 489	349 419	317 653	288 776	262 523	238 658	216 962	197 238	179 307	163 006	148 188	134 716	122 469
Active and passive leakage control			m3/annum	125 583	228 333	311 364	377 411	428 876	389 887	354 443	322 221	292 928	266 298	242 089	220 081	200 074	181 885	165 350	150 318
Retrofitting & removal of wasteful devices			m3/annum	0	812 637	1 477 521	2 014 802	2 442 184	2 775 209	2 522 917	2 293 561	2 085 056	1 895 505	1 723 187	1 566 533	1 424 121	1 294 656	1 176 960	1 069 963
Water Wise Gardening			m3/annum	0	168 965	307 209	418 922	507 784	577 027	514 079	457 807	407 517	362 588	322 460	286 631	254 651	226 117	200 667	177 975
Meter reading, billing & cost recovery			m3/annum	0	938 695	1 706 718	2 327 342	2 821 021	3 205 706	2 914 278	2 649 343	2 408 494	2 189 540	1 990 491	1 809 537	1 645 034	1 495 485	1 359 532	1 235 938
Water Use Efficiency			m3/annum	0	0	0	0	0	0	308 447	549 368	733 531	870 211	967 379	1 031 870	1 069 535	1 085 363	1 083 601	1 067 851
Other			m3/annum	0	459 333	835 150	1 138 841	1 380 414	1 411 787	1 688 332	1 773 288	1 828 845	1 859 645	1 869 730	1 862 613	1 841 338	1 808 537	1 766 482	1 717 128
Total			**m3/annum**	**227 900**	**3 025 416**	**5 312 410**	**7 158 583**	**8 625 184**	**9 467 595**	**9 309 750**	**8 961 274**	**8 588 812**	**8 200 552**	**7 803 303**	**7 402 691**	**7 003 322**	**6 608 925**	**6 222 484**	**5 846 347**

Unit reference values

All interventions				**45.3**	**8.5**	**4.4**	**3.0**	**2.2**	**1.9**	**1.0**	**0.9**	**0.9**	**0.8**	**0.8**	**0.8**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					4.7	2.4	1.6	1.2	0.9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				17.1	8.6	5.7	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				14.0	7.0	4.7	3.5	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					4.2	2.1	1.4	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					50.1	25.0	16.7	12.5	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					4.0	2.0	1.3	1.0	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management					3.1	1.5	1.0	0.8	0.7	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Awareness campaigns & Efficiency					22.1	11.1	7.4	5.5	4.9	5.5	4.0	3.2	2.6	2.3	2.0	1.8	1.6	1.5	1.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**
Sectorisation		CAPEX	Rands	17 410	15 828	14 389	13 081	11 891	10 810	9 828	8 934	8 122	7 384	6 712	6 102	5 547	5 043	4 585	4 168
		OPEX	Rands	21 763	19 784	17 986	16 351	14 864	13 513	12 285	11 168	10 153	9 230	8 391	7 628	6 934	6 304	5 731	5 210
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	43 526	39 569	35 972	32 702	29 729	27 026	24 569	22 336	20 305	18 459	16 781	15 256	13 869	12 608	11 462	10 420
Mains replacement		CAPEX	Rands	381 286	346 624	315 113	286 466	260 424	236 749	215 226	195 660	177 873	161 703	147 002	133 639	121 490	110 445	100 405	91 277
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	381 286	346 624	315 113	286 466	260 424	236 749	215 226	195 660	177 873	161 703	147 002	133 639	121 490	110 445	100 405	91 277
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	96 256	87 506	79 551	72 319	65 744	59 768	54 334	49 395	44 904	40 822	37 111	33 737	30 670	27 882	25 347	23 043
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	2 431 735	2 210 668	2 009 698	1 826 998	1 660 908	1 509 916	1 372 651	1 247 864	1 134 422	1 031 293	937 539	852 308	774 826	704 387	640 352	582 138
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	78 346	71 224	64 749	58 863	53 512	48 647	44 225	40 204	36 549	33 227	30 206	27 460	24 964	22 694	20 631	18 756
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	8 705	7 914	7 194	6 540	5 946	5 405	4 914	4 467	4 061	3 692	3 356	3 051	2 774	2 522	2 292	2 084
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**494 953**	**449 957**	**409 052**	**371 865**	**338 059**	**307 327**	**279 388**	**253 989**	**230 899**	**209 908**	**190 826**	**173 478**	**157 707**	**143 370**	**130 337**	**118 488**
		OPEX		**2 965 361**	**2 695 783**	**2 450 712**	**2 227 920**	**2 025 382**	**1 841 256**	**1 673 869**	**1 521 699**	**1 383 363**	**1 257 603**	**1 143 275**	**1 039 341**	**944 856**	**858 960**	**780 872**	**709 884**
		TOTAL		**3 460 314**	**3 145 740**	**2 859 764**	**2 599 785**	**2 363 441**	**2 148 583**	**1 953 257**	**1 775 688**	**1 614 262**	**1 467 511**	**1 334 101**	**1 212 819**	**1 102 563**	**1 002 330**	**911 209**	**828 372**
		REDUCED PAYMENT		**10 025 563**	**9 445 094**	**8 586 449**	**7 805 863**	**7 096 239**	**6 451 126**	**5 864 660**	**5 331 509**	**4 846 826**	**4 406 206**	**4 005 642**	**3 641 492**	**3 310 448**	**3 009 498**	**2 735 907**	**2 487 188**
		ADDITIONAL INCOME		**6 741 481**	**6 128 619**	**5 571 472**	**5 064 975**	**4 604 522**	**4 185 930**	**3 805 390**	**3 459 446**	**3 144 951**	**2 859 046**	**2 599 133**	**2 362 848**	**2 148 044**	**1 952 767**	**1 775 243**	**1 613 857**

			10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving			**Unit**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**
Pressure management			m3/annum	277 005	251 822	228 929	208 118	189 198	171 998	156 362	142 147	129 225	117 477	106 797	97 088	88 262	80 238	72 944	66 313
Mains replacement			m3/annum	111 336	101 214	92 013	83 648	76 044	69 131	62 846	57 133	51 939	47 217	42 925	39 022	35 475	32 250	29 318	26 653
Active and passive leakage control			m3/annum	136 653	124 230	112 936	102 669	93 336	84 851	77 137	70 125	63 750	57 954	52 686	47 896	43 542	39 584	35 985	32 714
Retrofitting & removal of wasteful devices			m3/annum	972 694	884 267	803 879	730 799	664 363	603 966	549 060	499 146	453 769	412 517	375 016	340 923	309 930	281 755	256 141	232 855
Water Wise Gardening			m3/annum	156 739	137 894	125 358	113 962	103 602	94 183	85 621	77 838	70 761	64 329	58 480	53 164	48 331	43 937	39 943	36 312
Meter reading, billing & cost recovery			m3/annum	1 123 580	1 021 437	928 579	844 162	767 420	697 655	634 232	576 574	524 158	476 508	433 189	393 808	358 007	325 461	295 874	268 976
Water Use Efficiency			m3/annum	1 057 991	1 034 205	940 186	854 714	777 013	706 376	642 160	583 781	530 710	482 464	438 604	398 731	362 482	329 529	299 572	272 338
Other			m3/annum	1 687 428	1 648 937	1 499 034	1 362 758	1 238 871	1 126 246	1 023 860	930 782	846 165	769 241	699 310	635 737	577 942	525 402	477 638	434 217
Total			**m3/annum**	**5 523 426**	**5 204 006**	**4 730 914**	**4 300 831**	**3 909 846**	**3 554 406**	**3 231 278**	**2 937 526**	**2 670 478**	**2 427 707**	**2 207 006**	**2 006 369**	**1 823 972**	**1 658 157**	**1 507 415**	**1 370 377**

Unit reference values

All interventions				**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Awareness campaigns & Efficiency				1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 2

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			10%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present cost			**Unit**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**Total**	**Average**
Sectorisation		CAPEX	Rands	3 789	3 445	3 131	2 847	2 588	2 353	2 139	1 944	1 768	1 607	1 461	1 328	1 207	1 098	869 025	18 892
		OPEX	Rands	4 736	4 306	3 914	3 558	3 235	2 941	2 673	2 430	2 209	2 009	1 826	1 660	1 509	1 372	1 086 281	23 615
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 790 787	82 408
		OPEX	Rands	9 472	8 611	7 829	7 117	6 470	5 882	5 347	4 861	4 419	4 017	3 652	3 320	3 018	2 744	2 172 562	47 230
Mains replacement		CAPEX	Rands	82 979	75 435	68 578	62 343	56 676	51 523	46 839	42 581	38 710	35 191	31 992	29 084	26 440	24 036	19 031 639	413 731
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	82 979	75 435	68 578	62 343	56 676	51 523	46 839	42 581	38 710	35 191	31 992	29 084	26 440	24 036	19 031 639	413 731
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 119 108	306 937
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	20 948	19 044	17 313	15 739	14 308	13 007	11 825	10 750	9 772	8 884	8 076	7 342	6 675	6 068	4 804 560	104 447
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	529 216	481 106	437 369	397 608	361 462	328 602	298 729	271 572	246 883	224 439	204 036	185 487	168 625	153 295	94 612 817	2 056 800
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	17 050	15 500	14 091	12 810	11 646	10 587	9 625	8 750	7 954	7 231	6 574	5 976	5 433	4 939	3 910 611	85 013
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	758 157	16 482
		OPEX	Rands	1 894	1 722	1 566	1 423	1 294	1 176	1 069	972	884	803	730	664	604	549	434 512	9 446
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 119 108	306 937
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Wise Gardening		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35 297 769	784 395
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**107 716**	**97 924**	**89 022**	**80 929**	**73 572**	**66 883**	**60 803**	**55 275**	**50 250**	**45 682**	**41 529**	**37 754**	**34 322**	**31 202**	**92 790 153**	**2 017 177**
		OPEX		**645 349**	**586 681**	**533 346**	**484 860**	**440 782**	**400 711**	**364 283**	**331 166**	**301 060**	**273 691**	**248 810**	**226 191**	**205 628**	**186 935**	**121 248 422**	**2 635 835**
		TOTAL		**753 065**	**684 605**	**622 368**	**565 789**	**514 354**	**467 594**	**425 086**	**386 442**	**351 310**	**319 373**	**290 339**	**263 945**	**239 950**	**218 136**	**214 038 575**	**4 653 012**
		REDUCED PAYMENT		**2 261 080**	**2 055 528**	**1 868 661**	**1 698 783**	**1 544 348**	**1 403 953**	**1 276 321**	**1 160 292**	**1 054 811**	**958 919**	**871 744**	**792 495**	**720 450**	**654 954**	**318 272 761**	**6 918 973**
		ADDITIONAL INCOME		**1 467 143**	**1 333 766**	**1 212 515**	**1 102 286**	**1 002 078**	**910 980**	**828 164**	**752 876**	**684 433**	**622 212**	**565 647**	**514 225**	**467 477**	**424 979**	**279 923 348**	**6 085 290**

		10%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present saving		**Unit**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**2030-31**	**Total**	**Average**
Pressure management		m3/annum	60 284	54 804	49 822	45 292	41 175	37 432	34 029	30 935	28 123	25 566	23 242	21 129	19 208	17 462	**10 440 426**	**226 966**
Mains replacement		m3/annum	24 230	22 027	20 025	18 204	16 549	15 045	13 677	12 434	11 303	10 276	9 342	8 492	7 720	7 019	**4 622 935**	**100 499**
Active and passive leakage control		m3/annum	29 740	27 036	24 578	22 344	20 313	18 466	16 787	15 261	13 874	12 613	11 466	10 424	9 476	8 615	**5 674 178**	**123 352**
Retrofitting & removal of wasteful devices		m3/annum	211 687	192 442	174 948	159 043	144 585	131 441	119 492	108 629	98 753	89 776	81 614	74 195	67 450	61 318	**36 661 264**	**796 984**
Water Wise Gardening		m3/annum	33 011	30 010	27 282	24 801	22 547	20 497	18 634	16 940	15 400	14 000	12 727	11 570	10 518	9 562	**6 768 350**	**147 138**
Meter reading, billing & cost recovery		m3/annum	244 524	222 294	202 086	183 714	167 013	151 830	138 027	125 479	114 072	103 702	94 275	85 704	77 913	70 830	**42 348 238**	**920 614**
Water Use Efficiency		m3/annum	247 580	225 073	204 612	186 011	169 101	153 728	139 753	127 048	115 498	104 998	95 453	86 775	78 887	71 715	**20 484 245**	**445 310**
Other		m3/annum	394 742	358 857	326 233	296 576	269 614	245 104	222 822	202 565	184 150	167 409	152 190	138 355	125 777	114 343	**41 923 767**	**911 386**
Total		**m3/annum**	**1 245 798**	**1 132 543**	**1 029 585**	**935 986**	**850 897**	**773 542**	**703 220**	**639 291**	**581 174**	**528 340**	**480 309**	**436 644**	**396 950**	**360 863**	**168 923 404**	**3 672 248**

Unit reference values																		
All interventions				**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**1.3**	**1.3**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.6
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.1	4.1
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.4	3.4
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	5.3
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.4
Management				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3
Awareness campaigns & Efficiency				1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	2.3	2.3

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality			Unit	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**
Billed consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232
Unbilled potential paid consumption	% of system input volume	10.0%	m3/annum	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851
Total potential revenue water		67%	**m3/annum**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**
Non-revenue water			**m3/annum**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**
Unbilled consumption	% of system input volume	1%	m3/annum	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282
Apparent losses		20%	m3/annum	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061
Unavoidable annual real losses		2.0	m3/annum	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Potential saving (Real losses)			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**
Target Sysem Input Volume			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**
% return flow			m3/annum	0%	50%	55%	60%	65%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Return flow			m3/annum	0	20 645 370	22 709 907	24 774 444	26 838 981	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	30%	m3/annum	0	127 283	254 566	381 849	509 131	636 414	763 697	890 980	1 018 263	1 145 546	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829
Mains replacement	Replace _% per annum, Saving 200l/km/h	10%	m3/annum	51 158	102 317	153 475	204 634	255 792	306 950	358 109	409 267	460 426	511 584	511 584	511 584	511 584	511 584	511 584	511 584
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	62 792	125 583	188 375	251 167	313 958	376 750	439 542	502 333	565 125	627 917	627 917	627 917	627 917	627 917	627 917	627 917
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	20	m3/annum	0	446 950	893 900	1 340 851	1 787 801	2 234 751	2 681 701	3 128 651	3 575 602	4 022 552	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502
Water Wise Gardening	Reduce billed consumption by _% for 1/3	10%	m3/annum	0	92 931	185 862	278 792	371 723	464 654	557 585	650 515	743 446	836 377	929 308	929 308	929 308	929 308	929 308	929 308
Total direct interventions			**m3/annum**	**113 950**	**895 064**	**1 676 178**	**2 457 292**	**3 238 406**	**4 019 520**	**4 800 634**	**5 581 748**	**6 362 861**	**7 143 975**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**
Indirect measureable interventions																			
Sectorisation																			
Tariff structures																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	0.0%	0.5%	1.0%	1.5%	2.0%	2.4%	2.9%	3.4%	3.9%	4.4%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%
Total indirect interventions			**m3/annum**	**0**	**252 633**	**505 266**	**757 899**	**1 010 532**	**1 263 165**	**1 515 798**	**1 768 431**	**2 021 063**	**2 273 696**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**
Total estimated savings			**m3/annum**	**113 950**	**1 147 697**	**2 181 444**	**3 215 191**	**4 248 938**	**5 282 684**	**6 316 431**	**7 350 178**	**8 383 925**	**9 417 672**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**
System Input Volume with WCWDM			**m3/annum**	**51 514 258**	**50 480 511**	**49 446 764**	**48 413 017**	**47 379 270**	**46 345 524**	**45 311 777**	**44 278 030**	**43 244 283**	**42 210 536**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**
% Reduction			**%**	**0%**	**2%**	**4%**	**6%**	**8%**	**10%**	**12%**	**14%**	**16%**	**18%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**
Meter reading, billing & cost recovery			**m3/annum**	**0**	**1 032 564**	**2 065 128**	**3 097 692**	**4 130 257**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**
Water Use Efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000
		OPEX	Rands	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000
Pressure management		CAPEX	Rands		500 000	500 000	500 000	500 000	500 000	500 000	500 000	500 000	500 000	500 000					
		OPEX	Rands	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
		OPEX	Rands	0															
Active and passive leakage control		CAPEX	Rands	0															
	R 1500 / km	OPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands		1 862 293	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293					
		OPEX	Rands	0															
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294
	Monthly meter reading @ R 5 / meter	OPEX	Rands	0															
Education and awareness campaigns		CAPEX	Rands	0															
	R 5 / consumer / month	OPEX	Rands	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878
Water audits / manage KPI's		CAPEX	Rands	0															
	R 1500 / zone / month	OPEX	Rands	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands	0	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000					
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands	0	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293	1 862 293					
	Replace 10% / annum @ R 500 / meter	OPEX	Rands	0															
Water Wise Gardening	R 2000 per customer	CAPEX	Rands	0	4 655 731	4 655 731	4 655 731	4 655 731	4 655 731	4 655 731	4 655 731	4 655 731	4 655 731	4 655 731					
		OPEX	Rands	0															
TOTAL COSTS		**CAPEX**	Rands	**2 274 294**	**11 254 611**	**11 254 611**	**11 254 611**	**11 254 611**	**11 254 611**	**11 254 611**	**11 254 611**	**11 254 611**	**11 254 611**	**11 254 611**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**
		OPEX	Rands	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**
		TOTAL	Rands	**10 313 172**	**19 293 488**	**19 293 488**	**19 293 488**	**19 293 488**	**19 293 488**	**19 293 488**	**19 293 488**	**19 293 488**	**19 293 488**	**19 293 488**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**
		REDUCED PA	R 3.00	**341 850**	**3 443 091**	**6 544 331**	**9 645 572**	**12 746 813**	**15 848 053**	**18 949 294**	**22 050 534**	**25 151 775**	**28 253 015**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**
		ADDITIONAL	R 6.00	**0**	**6 195 385**	**12 390 770**	**18 586 155**	**24 781 540**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality			Unit	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
System input volume without WCWDM			**m3/annum**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**
Billed consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232
Unbilled potential paid consumption	% of system input volume	10.0%	m3/annum	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851
Total potential revenue water		67%	**m3/annum**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**
Non-revenue water			**m3/annum**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**
Unbilled consumption	% of system input volume	1%	m3/annum	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282
Apparent losses		20%	m3/annum	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061
Unavoidable annual real losses		2.0	m3/annum	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Potential saving (Real losses)			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**
Target Sysem Input Volume			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**
% return flow			m3/annum	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Return flow			m3/annum	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	30%	m3/annum	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829
Mains replacement	Replace _% per annum, Saving 200l/km/h	10%	m3/annum	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	20	m3/annum	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502
Water Wise Gardening	Reduce billed consumption by _% for 1/3	10%	m3/annum	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308
Total direct interventions			**m3/annum**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**
Indirect measureable interventions																			
Sectorisation																			
Tariff structures																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%
Total indirect interventions			**m3/annum**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**
Total estimated savings			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**
System Input Volume with WCWDM			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**
Meter reading, billing & cost recovery			**m3/annum**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**
Water Use Efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000
		OPEX	Rands	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000
Pressure management		CAPEX	Rands																
		OPEX	Rands	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
		OPEX	Rands																
Active and passive leakage control		CAPEX	Rands																
	R 1500 / km	OPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands																
		OPEX	Rands																
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294
	Monthly meter reading @ R 5 / meter	OPEX	Rands																
Education and awareness campaigns		CAPEX	Rands																
	R 5 / consumer / month	OPEX	Rands	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878
Water audits / manage KPI's		CAPEX	Rands																
	R 1500 / zone / month	OPEX	Rands	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands																
	Replace 10% / annum @ R 500 / meter	OPEX	Rands																
Water Wise Gardening	R 2000 per customer	CAPEX	Rands																
		OPEX	Rands																
TOTAL COSTS		**CAPEX**	Rands	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**
		OPEX	Rands	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**
		TOTAL	Rands	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**
		REDUCED PA	R 3.00	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**
		ADDITIONAL	R 6.00	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
SYSTEM WATER BALANCE																			
Average annual growth rate			%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
System input volume without WCWDM			**m3/annum**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**51 628 208**	**2 374 897 568**	**51 628 208**
Billed consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	1 282 444 687	27 879 232
% Cost recovery of billed consumption			%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billed paid consumption			m3/annum	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	27 879 232	1 282 444 687	27 879 232
Unbilled potential paid consumption	% of system input volume	10.0%	m3/annum	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	5 162 821	237 489 757	5 162 821
Billed paid consumption (zero rate)	kl/annum free basic water	72	m3/annum	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	1 340 851	61 679 129	1 340 851
Total potential revenue water		67%	**m3/annum**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**34 382 904**	**1 581 613 572**	**34 382 904**
Non-revenue water			**m3/annum**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**17 245 304**	**793 283 996**	**17 245 304**
Unbilled consumption	% of system input volume	1%	m3/annum	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	516 282	23 748 976	516 282
Apparent losses		20%	m3/annum	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	3 449 061	158 656 799	3 449 061
Unavoidable annual real losses		2.0	m3/annum	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	2 942 493	135 354 667	2 942 493
% inefficient use reduction			%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
Potential saving (Real losses)			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**475 523 554**	**10 337 469**
Target Sysem Input Volume			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**1 899 374 014**	**41 290 739**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**
% return flow			m3/annum	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	54%	54%
Return flow			m3/annum	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	28 903 518	1 280 012 922	27 826 368
WDM STRATEGY - Potential saving																			
Direct measurable interventions																			
Pressure management	25% of MNF with HDF of 20. % of area	30%	m3/annum	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	1 272 829	51 549 560	1 120 643
Mains replacement	Replace _% per annum, Saving 200l/km/h	10%	m3/annum	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	511 584	21 230 736	461 538
Active and passive leakage control	Estimate 1 leak/km/annum @ 1.6m3/h for 1 week		m3/annum	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	627 917	26 058 547	566 490
Retrofitting & removal of wasteful devices	Estimated m^3/property/month saving	20	m3/annum	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	4 469 502	181 014 834	3 935 105
Water Wise Gardening	Reduce billed consumption by _% for 1/3	10%	m3/annum	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	929 308	37 636 964	818 195
Total direct interventions			**m3/annum**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**7 811 139**	**317 490 641**	**6 901 970**
Indirect measureable interventions																			
Sectorisation																			
Tariff structures																			
Water audits																			
Management meters																			
Consumer meters																			
Management/monitoring performance targets																			
% improvement per annum			%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.3%	4.3%
Total indirect interventions			**m3/annum**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**2 526 329**	**102 316 336**	**2 224 268**
Total estimated savings			**m3/annum**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**10 337 469**	**419 806 978**	**9 126 239**
System Input Volume with WCWDM			**m3/annum**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**41 290 739**	**1 955 090 590**	**42 501 969**
% Reduction			**%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**20%**	**18%**	**18%**
Meter reading, billing & cost recovery			**m3/annum**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**5 162 821**	**222 001 294**	**4 826 115**
Water Use Efficiency			**m3/annum**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
WDM STRATEGY - IMPLEMENTATION COSTS																			
Sectorisation	Establishment R 20 000 / zone	CAPEX	Rands	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	80 000	**3 680 000**	**80 000**
		OPEX	Rands	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	**4 600 000**	**100 000**
Pressure management		CAPEX	Rands															**5 000 000**	**500 000**
		OPEX	Rands	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	**9 200 000**	**200 000**
Mains replacement	Replace 2% / annum @ R 150 /m	CAPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	**80 592 000**	**1 752 000**
		OPEX	Rands															**0**	**0**
Active and passive leakage control		CAPEX	Rands															**0**	**0**
	R 1500 / km	OPEX	Rands	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	1 752 000	**80 592 000**	**1 752 000**
Retrofitting & removal of wasteful devices	20% of properties @ R 1000 / property	CAPEX	Rands															**18 622 925**	**1 862 293**
		OPEX	Rands															**0**	**0**
Meter reading, billing & cost recovery	Consumer meter audit @ R 50 / meter	CAPEX	Rands	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	442 294	**20 345 546**	**442 294**
	Monthly meter reading @ R 5 / meter	OPEX	Rands															**0**	**0**
Education and awareness campaigns		CAPEX	Rands															**0**	**0**
	R 5 / consumer / month	OPEX	Rands	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	5 586 878	**256 996 370**	**5 586 878**
Water audits / manage KPI's		CAPEX	Rands															**0**	**0**
	R 1500 / zone / month	OPEX	Rands	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	360 000	**16 560 000**	**360 000**
Management meters	New meters @ R 50 000 / meter	CAPEX	Rands															**1 000 000**	**90 909**
	Replace 10% / annum @ R 10 000 / meter	OPEX	Rands	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	**1 840 000**	**40 000**
Consumer meters	New meters @ R 1000 / meter	CAPEX	Rands															**18 622 925**	**1 692 993**
	Replace 10% / annum @ R 500 / meter	OPEX	Rands															**0**	**0**
Water Wise Gardening	R 2000 per customer	CAPEX	Rands															**46 557 313**	**4 232 483**
		OPEX	Rands															**0**	**0**
TOTAL COSTS		**CAPEX**	Rands	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**2 274 294**	**194 420 710**	**4 226 537**
		OPEX	Rands	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**8 038 878**	**369 788 370**	**8 038 878**
		TOTAL	Rands	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**10 313 172**	**564 209 079**	**12 265 415**
		REDUCED PA	R 3.00	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**31 012 406**	**1 259 420 933**	**27 378 716**
		ADDITIONAL	R 6.00	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**30 976 925**	**1 332 007 766**	**28 956 691**

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

Discount rate : 6%

Net present cost			Unit	0 2006-07	1 2007-08	2 2008-09	3 2009-10	4 2010-11	5 2011-12	6 2012-13	7 2013-14	8 2014-15	9 2015-16	10 2016-17	11 2017-18	12 2018-19	13 2019-20	14 2020-21	15 2021-22
Sectorisation		CAPEX	Rands	80 000	75 472	71 200	67 170	63 367	59 781	56 397	53 205	50 193	47 352	44 672	42 143	39 758	37 507	35 384	33 381
		OPEX	Rands	100 000	94 340	89 000	83 962	79 209	74 726	70 496	66 506	62 741	59 190	55 839	52 679	49 697	46 884	44 230	41 727
Pressure management		CAPEX	Rands	0	471 698	444 998	419 810	396 047	373 629	352 480	332 529	313 706	295 949	279 197	0	0	0	0	0
		OPEX	Rands	200 000	188 679	177 999	167 924	158 419	149 452	140 992	133 011	125 482	118 380	111 679	105 358	99 394	93 768	88 460	83 453
Mains replacement		CAPEX	Rands	1 752 000	1 652 830	1 559 274	1 471 013	1 387 748	1 309 196	1 235 091	1 165 180	1 099 226	1 037 006	978 308	922 932	870 690	821 406	774 911	731 048
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 752 000	1 652 830	1 559 274	1 471 013	1 387 748	1 309 196	1 235 091	1 165 180	1 099 226	1 037 006	978 308	922 932	870 690	821 406	774 911	731 048
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	1 756 880	1 657 434	1 563 617	1 475 110	1 391 613	1 312 843	1 238 531	1 168 425	1 102 288	1 039 894	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	442 294	417 259	393 641	371 359	350 339	330 508	311 800	294 151	277 501	261 793	246 975	232 995	219 807	207 365	195 627	184 554
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	5 586 878	5 270 639	4 972 301	4 690 850	4 425 330	4 174 840	3 938 528	3 715 593	3 505 276	3 306 864	3 119 683	2 943 097	2 776 507	2 619 346	2 471 081	2 331 209
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	360 000	339 623	320 399	302 263	285 154	269 013	253 786	239 421	225 868	213 083	201 022	189 644	178 909	168 782	159 228	150 215
Management meters		CAPEX	Rands	0	94 340	89 000	83 962	79 209	74 726	70 496	66 506	62 741	59 190	55 839	0	0	0	0	0
		OPEX	Rands	40 000	37 736	35 600	33 585	31 684	29 890	28 198	26 602	25 096	23 676	22 336	21 072	19 879	18 754	17 692	16 691
Consumer meters		CAPEX	Rands	0	1 756 880	1 657 434	1 563 617	1 475 110	1 391 613	1 312 843	1 238 531	1 168 425	1 102 288	1 039 894	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Conservation		CAPEX	Rands	0	4 392 199	4 143 584	3 909 042	3 687 775	3 479 033	3 282 107	3 096 327	2 921 063	2 755 720	2 599 736	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**2 274 294**	**10 617 557**	**10 016 564**	**9 449 588**	**8 914 706**	**8 410 100**	**7 934 057**	**7 484 959**	**7 061 282**	**6 661 587**	**6 284 516**	**1 198 070**	**1 130 255**	**1 066 278**	**1 005 923**	**948 984**
		OPEX		**8 038 878**	**7 583 847**	**7 154 572**	**6 749 597**	**6 367 544**	**6 007 117**	**5 667 091**	**5 346 313**	**5 043 691**	**4 758 199**	**4 488 867**	**4 234 780**	**3 995 076**	**3 768 940**	**3 555 603**	**3 354 343**
		TOTAL		**10 313 172**	**18 201 404**	**17 171 136**	**16 199 185**	**15 282 250**	**14 417 217**	**13 601 148**	**12 831 272**	**12 104 973**	**11 419 786**	**10 773 383**	**5 432 850**	**5 125 331**	**4 835 218**	**4 561 526**	**4 303 326**
		REDUCED PAYMENT		**341 850**	**3 248 199**	**5 824 432**	**8 098 608**	**10 096 669**	**11 842 587**	**13 358 504**	**14 664 865**	**15 780 535**	**16 722 916**	**17 317 165**	**16 336 948**	**15 412 216**	**14 539 826**	**13 716 817**	**12 940 393**
		ADDITIONAL INCOME		**0**	**5 844 703**	**11 027 741**	**15 605 294**	**19 629 301**	**23 147 760**	**21 837 510**	**20 601 424**	**19 435 306**	**18 335 194**	**17 297 353**	**16 318 258**	**15 394 583**	**14 523 191**	**13 701 124**	**12 925 588**

Net present saving			Unit	6% 0 2006-07	1 2007-08	2 2008-09	3 2009-10	4 2010-11	5 2011-12	6 2012-13	7 2013-14	8 2014-15	9 2015-16	10 2016-17	11 2017-18	12 2018-19	13 2019-20	14 2020-21	15 2021-22
Pressure management			m3/annum	0	120 078	226 563	320 607	403 280	475 566	538 376	592 553	638 871	678 047	710 741	670 510	632 557	596 752	562 973	531 107
Mains replacement			m3/annum	51 158	96 525	136 592	171 814	202 611	229 371	252 453	272 186	288 877	302 806	285 666	269 496	254 242	239 851	226 274	213 466
Active and passive leakage control			m3/annum	62 792	118 475	167 653	210 884	248 684	281 530	309 860	334 080	354 566	371 663	350 625	330 779	312 055	294 392	277 728	262 008
Retrofitting & removal of wasteful devices			m3/annum	0	421 651	795 568	1 125 804	1 416 106	1 669 936	1 890 494	2 080 732	2 243 377	2 380 942	2 495 747	2 354 478	2 221 206	2 095 477	1 976 865	1 864 967
Water Wise Gardening			m3/annum	0	87 671	165 416	234 079	294 440	347 216	393 075	432 630	466 447	495 050	518 921	489 548	461 837	435 696	411 034	387 768
Meter reading, billing & cost recovery			m3/annum	0	974 117	1 837 957	2 600 882	3 271 550	3 857 960	3 639 585	3 433 571	3 239 218	3 055 866	2 882 892	2 719 710	2 565 764	2 420 532	2 283 521	2 154 265
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	0	238 333	449 685	636 346	800 436	943 910	1 068 577	1 176 107	1 268 040	1 345 797	1 410 689	1 330 839	1 255 508	1 184 442	1 117 398	1 054 149
Total			**m3/annum**	**113 950**	**2 056 850**	**3 779 434**	**5 300 418**	**6 637 107**	**7 805 489**	**8 092 420**	**8 321 859**	**8 499 396**	**8 630 171**	**8 655 281**	**8 165 359**	**7 703 169**	**7 267 141**	**6 855 793**	**6 467 729**

Unit reference values

All interventions				**90.5**	**8.8**	**4.5**	**3.1**	**2.3**	**1.8**	**1.7**	**1.5**	**1.4**	**1.3**	**1.2**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					5.5	2.7	1.8	1.4	1.1	0.9	0.8	0.7	0.6	0.5	0.2	0.2	0.2	0.2	0.2
Mains replacement				34.2	17.1	11.4	8.6	6.8	5.7	4.9	4.3	3.8	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				27.9	14.0	9.3	7.0	5.6	4.7	4.0	3.5	3.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					4.2	2.1	1.4	1.0	0.8	0.7	0.6	0.5	0.5	0.4	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					50.1	25.0	16.7	12.5	10.0	8.3	7.2	6.3	5.6	5.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					2.2	1.1	0.7	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.1	0.1	0.1	0.1	0.1
Management					5.4	2.7	1.8	1.3	1.1	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency					44.2	22.1	14.7	11.1	8.8	7.4	6.3	5.5	4.9	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			Discount rate :	6%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost				**Unit**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Sectorisation		CAPEX		Rands	31 492	29 709	28 028	26 441	24 944	23 532	22 200	20 944	19 758	18 640	17 585	16 589	15 650	14 765	13 929	13 140
		OPEX		Rands	39 365	37 136	35 034	33 051	31 180	29 416	27 751	26 180	24 698	23 300	21 981	20 737	19 563	18 456	17 411	16 425
Pressure management		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	78 729	74 273	70 069	66 103	62 361	58 831	55 501	52 359	49 396	46 600	43 962	41 474	39 126	36 911	34 822	32 851
Mains replacement		CAPEX		Rands	689 668	650 630	613 802	579 059	546 282	515 360	486 189	458 669	432 706	408 214	385 107	363 309	342 744	323 343	305 041	287 774
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	689 668	650 630	613 802	579 059	546 282	515 360	486 189	458 669	432 706	408 214	385 107	363 309	342 744	323 343	305 041	287 774
Retrofitting & removal of wasteful devices		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX		Rands	174 108	164 252	154 955	146 184	137 910	130 103	122 739	115 791	109 237	103 054	97 221	91 718	86 526	81 628	77 008	72 649
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	2 199 254	2 074 768	1 957 328	1 846 536	1 742 015	1 643 410	1 550 387	1 462 629	1 379 839	1 301 735	1 228 052	1 158 539	1 092 962	1 031 096	972 732	917 672
Water audits / manage KPI's		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	141 713	133 691	126 124	118 985	112 250	105 896	99 902	94 247	88 912	83 880	79 132	74 652	70 427	66 440	62 680	59 132
Management meters		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	15 746	14 855	14 014	13 221	12 472	11 766	11 100	10 472	9 879	9 320	8 792	8 295	7 825	7 382	6 964	6 570
Consumer meters		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Conservation		CAPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**			**895 268**	**844 592**	**796 785**	**751 684**	**709 136**	**668 996**	**631 128**	**595 404**	**561 702**	**529 907**	**499 913**	**471 616**	**444 921**	**419 736**	**395 978**	**373 564**
		OPEX			**3 164 474**	**2 985 353**	**2 816 371**	**2 656 954**	**2 506 560**	**2 364 679**	**2 230 830**	**2 104 556**	**1 985 430**	**1 873 047**	**1 767 026**	**1 667 006**	**1 572 647**	**1 483 629**	**1 399 650**	**1 320 425**
		TOTAL			**4 059 742**	**3 829 945**	**3 613 156**	**3 408 638**	**3 215 696**	**3 033 675**	**2 861 958**	**2 699 960**	**2 547 132**	**2 402 955**	**2 266 939**	**2 138 621**	**2 017 567**	**1 903 365**	**1 795 628**	**1 693 988**
		REDUCED PAYMENT			**12 207 918**	**11 516 904**	**10 865 004**	**10 250 004**	**9 669 815**	**9 122 467**	**8 606 101**	**8 118 963**	**7 659 399**	**7 225 848**	**6 816 838**	**6 430 979**	**6 066 961**	**5 723 548**	**5 399 574**	**5 093 938**
		ADDITIONAL INCOME			**12 193 951**	**11 503 728**	**10 852 573**	**10 238 277**	**9 658 752**	**9 112 030**	**8 596 255**	**8 109 674**	**7 650 636**	**7 217 581**	**6 809 039**	**6 423 621**	**6 060 020**	**5 717 000**	**5 393 396**	**5 088 110**

				6%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving				**Unit**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Pressure management				m3/annum	501 044	472 683	445 928	420 686	396 874	374 409	353 216	333 223	314 361	296 567	279 781	263 944	249 004	234 909	221 612	209 068
Mains replacement				m3/annum	201 383	189 984	179 230	169 085	159 514	150 485	141 967	133 931	126 350	119 198	112 451	106 086	100 081	94 416	89 072	84 030
Active and passive leakage control				m3/annum	247 177	233 186	219 987	207 535	195 787	184 705	174 250	164 387	155 082	146 304	138 022	130 210	122 839	115 886	109 327	103 138
Retrofitting & removal of wasteful devices				m3/annum	1 759 403	1 659 814	1 565 862	1 477 229	1 393 612	1 314 728	1 240 310	1 170 103	1 103 871	1 041 388	982 441	926 831	874 369	824 877	778 186	734 137
Water Wise Gardening				m3/annum	365 819	345 112	325 577	307 148	289 763	273 361	257 888	243 290	229 519	216 527	204 271	192 709	181 801	171 510	161 802	152 643
Meter reading, billing & cost recovery				m3/annum	2 032 325	1 917 288	1 808 762	1 706 379	1 609 792	1 518 672	1 432 709	1 351 612	1 275 106	1 202 930	1 134 840	1 070 604	1 010 003	952 833	898 899	848 018
Water Use Efficiency				m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other				m3/annum	994 480	938 189	885 084	834 985	787 721	743 133	701 069	661 386	623 949	588 631	555 313	523 880	494 226	466 251	439 860	414 962
Total				**m3/annum**	**6 101 631**	**5 756 256**	**5 430 430**	**5 123 047**	**4 833 063**	**4 559 494**	**4 301 409**	**4 057 933**	**3 828 239**	**3 611 546**	**3 407 119**	**3 214 263**	**3 032 324**	**2 860 683**	**2 698 757**	**2 545 998**
Unit reference values																				
All interventions					**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement					3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC					2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management					0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency					4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

Discount rate : 6%

Net present cost			Unit	32 2038-39	33 2039-40	34 2040-41	35 2041-42	36 2042-43	37 2043-44	38 2044-45	39 2045-46	40 2046-47	41 2047-48	42 2048-49	43 2049-50	44 2050-51	45 2051-52	Total	Average
Sectorisation		CAPEX	Rands	12 397	11 695	11 033	10 408	9 819	9 263	8 739	8 244	7 778	7 338	6 922	6 530	6 161	5 812	1 316 467	28 619
		OPEX	Rands	15 496	14 619	13 791	13 011	12 274	11 579	10 924	10 306	9 722	9 172	8 653	8 163	7 701	7 265	1 645 583	35 774
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 680 044	80 001
		OPEX	Rands	30 991	29 237	27 582	26 021	24 548	23 159	21 848	20 611	19 444	18 344	17 305	16 326	15 402	14 530	3 291 166	71 547
Mains replacement		CAPEX	Rands	271 485	256 118	241 621	227 944	215 042	202 870	191 386	180 553	170 333	160 692	151 596	143 015	134 920	127 283	28 830 618	626 753
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	271 485	256 118	241 621	227 944	215 042	202 870	191 386	180 553	170 333	160 692	151 596	143 015	134 920	127 283	28 830 618	626 753
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13 706 635	297 970
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	68 537	64 657	60 998	57 545	54 288	51 215	48 316	45 581	43 001	40 567	38 271	36 104	34 061	32 133	7 278 324	158 224
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	865 728	816 725	770 495	726 882	685 738	646 922	610 304	575 759	543 168	512 423	483 418	456 055	430 240	405 887	91 936 720	1 998 624
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	55 785	52 627	49 648	46 838	44 187	41 686	39 326	37 100	35 000	33 019	31 150	29 387	27 723	26 154	5 924 100	128 785
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	736 009	16 000
		OPEX	Rands	6 198	5 847	5 516	5 204	4 910	4 632	4 370	4 122	3 889	3 669	3 461	3 265	3 080	2 906	658 233	14 309
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13 706 635	297 970
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Conservation		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34 266 588	744 926
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**352 419**	**332 471**	**313 651**	**295 898**	**279 149**	**263 348**	**248 441**	**234 379**	**221 112**	**208 596**	**196 789**	**185 650**	**175 141**	**165 228**	**103 521 318**	**2 250 463**
		OPEX		**1 245 684**	**1 175 173**	**1 108 654**	**1 045 900**	**986 698**	**930 847**	**878 158**	**828 451**	**781 557**	**737 318**	**695 583**	**656 211**	**619 067**	**584 025**	**132 286 420**	**2 875 792**
		TOTAL		**1 598 102**	**1 507 644**	**1 422 305**	**1 341 798**	**1 265 847**	**1 194 195**	**1 126 599**	**1 062 829**	**1 002 669**	**945 914**	**892 372**	**841 860**	**794 208**	**749 253**	**235 807 738**	**5 126 255**
		REDUCED PAYMENT		**4 805 602**	**4 533 586**	**4 276 968**	**4 034 876**	**3 806 487**	**3 591 025**	**3 387 760**	**3 196 000**	**3 015 094**	**2 844 428**	**2 683 423**	**2 531 531**	**2 388 237**	**2 253 054**	**368 364 861**	**8 007 932**
		ADDITIONAL INCOME		**4 800 104**	**4 528 400**	**4 272 075**	**4 030 260**	**3 802 132**	**3 586 917**	**3 383 884**	**3 192 343**	**3 011 644**	**2 841 174**	**2 680 353**	**2 528 635**	**2 385 504**	**2 250 476**	**423 542 871**	**9 207 454**

Net present saving			**6%** Unit	32 2038-39	33 2039-40	34 2040-41	35 2041-42	36 2042-43	37 2043-44	38 2044-45	39 2045-46	40 2046-47	41 2047-48	42 2048-49	43 2049-50	44 2050-51	45 2051-52	Total	Average
Pressure management			m3/annum	197 234	186 070	175 538	165 602	156 228	147 385	139 042	131 172	123 747	116 743	110 135	103 901	98 019	92 471	**15 009 177**	**326 286**
Mains replacement			m3/annum	79 274	74 787	70 553	66 560	62 792	59 238	55 885	52 722	49 737	46 922	44 266	41 760	39 397	37 167	**6 431 713**	**139 820**
Active and passive leakage control			m3/annum	97 300	91 793	86 597	81 695	77 071	72 708	68 593	64 710	61 047	57 592	54 332	51 257	48 355	45 618	**7 894 267**	**171 615**
Retrofitting & removal of wasteful devices			m3/annum	692 582	653 380	616 396	581 506	548 590	517 538	488 243	460 607	434 535	409 938	386 734	364 844	344 192	324 710	**52 704 305**	**1 145 746**
Water Wise Gardening			m3/annum	144 003	135 852	128 162	120 908	114 064	107 607	101 517	95 770	90 349	85 235	80 411	75 859	71 565	67 514	**10 958 384**	**238 226**
Meter reading, billing & cost recovery			m3/annum	800 017	754 733	712 013	671 710	633 689	597 819	563 981	532 057	501 941	473 529	446 725	421 439	397 584	375 079	**70 590 479**	**1 534 576**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	391 473	369 315	348 410	328 689	310 084	292 532	275 973	260 352	245 615	231 713	218 597	206 223	194 550	183 538	**29 790 439**	**647 618**
Total			**m3/annum**	**2 401 884**	**2 265 929**	**2 137 669**	**2 016 669**	**1 902 517**	**1 794 828**	**1 693 234**	**1 597 390**	**1 506 972**	**1 421 672**	**1 341 200**	**1 265 283**	**1 193 663**	**1 126 097**	**193 378 765**	**4 203 886**

Unit reference values																			
All interventions				**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**1.2**	**1.2**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.5
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.5	4.5
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.7	3.7
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	3.1
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3
Management				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7
Awareness campaigns & Efficiency				4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	6.2	6.2

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

Discount rate : 8%

Net present cost			Unit	0 2006-07	1 2007-08	2 2008-09	3 2009-10	4 2010-11	5 2011-12	6 2012-13	7 2013-14	8 2014-15	9 2015-16	10 2016-17	11 2017-18	12 2018-19	13 2019-20	14 2020-21	15 2021-22
Sectorisation		CAPEX	Rands	80 000	74 074	68 587	63 507	58 802	54 447	50 414	46 679	43 222	40 020	37 055	34 311	31 769	29 416	27 237	25 219
		OPEX	Rands	100 000	92 593	85 734	79 383	73 503	68 058	63 017	58 349	54 027	50 025	46 319	42 888	39 711	36 770	34 046	31 524
Pressure management		CAPEX	Rands	0	462 963	428 669	396 916	367 515	340 292	315 085	291 745	270 134	250 124	231 597	0	0	0	0	0
		OPEX	Rands	200 000	185 185	171 468	158 766	147 006	136 117	126 034	116 698	108 054	100 050	92 639	85 777	79 423	73 540	68 092	63 048
Mains replacement		CAPEX	Rands	1 752 000	1 622 222	1 502 058	1 390 794	1 287 772	1 192 382	1 104 057	1 022 275	946 551	876 436	811 515	751 403	695 743	644 207	596 488	552 303
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 752 000	1 622 222	1 502 058	1 390 794	1 287 772	1 192 382	1 104 057	1 022 275	946 551	876 436	811 515	751 403	695 743	644 207	596 488	552 303
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	1 724 345	1 596 616	1 478 348	1 368 841	1 267 445	1 173 560	1 086 630	1 006 139	931 610	862 602	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	442 294	409 532	379 196	351 108	325 100	301 018	278 721	258 075	238 958	221 257	204 868	189 693	175 641	162 631	150 584	139 430
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	5 586 878	5 173 035	4 789 847	4 435 044	4 106 522	3 802 335	3 520 681	3 259 889	3 018 416	2 794 830	2 587 805	2 396 116	2 218 626	2 054 283	1 902 114	1 761 217
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	360 000	333 333	308 642	285 780	264 611	245 010	226 861	210 057	194 497	180 090	166 750	154 398	142 961	132 371	122 566	113 487
Management meters		CAPEX	Rands	0	92 593	85 734	79 383	73 503	68 058	63 017	58 349	54 027	50 025	46 319	0	0	0	0	0
		OPEX	Rands	40 000	37 037	34 294	31 753	29 401	27 223	25 207	23 340	21 611	20 010	18 528	17 155	15 885	14 708	13 618	12 610
Consumer meters		CAPEX	Rands	0	1 724 345	1 596 616	1 478 348	1 368 841	1 267 445	1 173 560	1 086 630	1 006 139	931 610	862 602	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Conservation		CAPEX	Rands	0	4 310 862	3 991 539	3 695 870	3 422 102	3 168 613	2 933 900	2 716 575	2 515 347	2 329 025	2 156 504	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**2 274 294**	**10 420 936**	**9 649 015**	**8 934 273**	**8 272 475**	**7 659 699**	**7 092 314**	**6 566 957**	**6 080 516**	**5 630 107**	**5 213 062**	**975 406**	**903 154**	**836 253**	**774 309**	**716 952**
		OPEX		**8 038 878**	**7 443 405**	**6 892 042**	**6 381 520**	**5 908 815**	**5 471 125**	**5 065 856**	**4 690 608**	**4 343 155**	**4 021 440**	**3 723 556**	**3 447 737**	**3 192 349**	**2 955 879**	**2 736 925**	**2 534 189**
		TOTAL		**10 313 172**	**17 864 341**	**16 541 057**	**15 315 793**	**14 181 290**	**13 130 824**	**12 158 170**	**11 257 565**	**10 423 671**	**9 651 548**	**8 936 618**	**4 423 143**	**4 095 503**	**3 792 132**	**3 511 233**	**3 251 142**
		REDUCED PAYMENT		**341 850**	**3 188 047**	**5 610 709**	**7 656 966**	**9 369 288**	**10 785 919**	**11 941 269**	**12 866 275**	**13 588 721**	**14 133 542**	**14 364 744**	**13 300 689**	**12 315 453**	**11 403 197**	**10 558 516**	**9 776 404**
		ADDITIONAL INCOME		**0**	**5 736 468**	**10 623 088**	**14 754 289**	**18 215 172**	**21 082 375**	**19 520 717**	**18 074 738**	**16 735 869**	**15 496 175**	**14 348 310**	**13 285 472**	**12 301 363**	**11 390 151**	**10 546 436**	**9 765 219**

Net present saving			**8%** Unit	0 2006-07	1 2007-08	2 2008-09	3 2009-10	4 2010-11	5 2011-12	6 2012-13	7 2013-14	8 2014-15	9 2015-16	10 2016-17	11 2017-18	12 2018-19	13 2019-20	14 2020-21	15 2021-22
Pressure management			m3/annum	0	117 855	218 249	303 124	374 227	433 133	481 259	519 878	550 136	573 058	589 566	545 894	505 458	468 016	433 349	401 249
Mains replacement			m3/annum	51 158	94 738	131 580	162 445	188 015	208 905	225 669	238 803	248 754	255 919	236 962	219 410	203 157	188 108	174 174	161 273
Active and passive leakage control			m3/annum	62 792	116 281	161 501	199 384	230 769	256 410	276 986	293 107	305 320	314 115	290 847	269 303	249 354	230 884	213 781	197 946
Retrofitting & removal of wasteful devices			m3/annum	0	413 843	766 376	1 064 410	1 314 087	1 520 934	1 689 927	1 825 538	1 931 786	2 012 277	2 070 244	1 916 893	1 774 901	1 643 427	1 521 691	1 408 973
Water Wise Gardening			m3/annum	0	86 047	159 346	221 314	273 228	316 236	351 373	379 570	401 661	418 397	430 449	398 564	369 041	341 705	316 393	292 957
Meter reading, billing & cost recovery			m3/annum	0	956 078	1 770 515	2 459 048	3 035 862	3 513 729	3 253 453	3 012 456	2 789 311	2 582 696	2 391 385	2 214 245	2 050 227	1 898 358	1 757 739	1 627 536
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	0	233 919	433 184	601 644	742 771	859 689	955 210	1 031 862	1 091 918	1 137 414	1 170 179	1 083 499	1 003 240	928 926	860 117	796 404
Total			**m3/annum**	**113 950**	**2 018 760**	**3 640 751**	**5 011 370**	**6 158 958**	**7 109 035**	**7 233 876**	**7 301 215**	**7 318 885**	**7 293 876**	**7 179 633**	**6 647 808**	**6 155 378**	**5 699 424**	**5 277 245**	**4 886 338**

Unit reference values

All interventions				**90.5**	**8.8**	**4.5**	**3.1**	**2.3**	**1.8**	**1.7**	**1.5**	**1.4**	**1.3**	**1.2**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					5.5	2.7	1.8	1.4	1.1	0.9	0.8	0.7	0.6	0.5	0.2	0.2	0.2	0.2	0.2
Mains replacement				34.2	17.1	11.4	8.6	6.8	5.7	4.9	4.3	3.8	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				27.9	14.0	9.3	7.0	5.6	4.7	4.0	3.5	3.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					4.2	2.1	1.4	1.0	0.8	0.7	0.6	0.5	0.5	0.4	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					50.1	25.0	16.7	12.5	10.0	8.3	7.2	6.3	5.6	5.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					2.2	1.1	0.7	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.1	0.1	0.1	0.1	0.1
Management					5.4	2.7	1.8	1.3	1.1	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency					44.2	22.1	14.7	11.1	8.8	7.4	6.3	5.5	4.9	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

Discount rate : 8%				16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost			**Unit**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Sectorisation		CAPEX	Rands	23 351	21 622	20 020	18 537	17 164	15 892	14 715	13 625	12 616	11 681	10 816	10 015	9 273	8 586	7 950	7 361
		OPEX	Rands	29 189	27 027	25 025	23 171	21 455	19 866	18 394	17 032	15 770	14 602	13 520	12 519	11 591	10 733	9 938	9 202
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	58 378	54 054	50 050	46 342	42 910	39 731	36 788	34 063	31 540	29 204	27 040	25 037	23 183	21 466	19 875	18 403
Mains replacement		CAPEX	Rands	511 392	473 511	438 436	405 960	375 888	348 045	322 264	298 392	276 289	255 823	236 873	219 327	203 081	188 038	174 109	161 212
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	511 392	473 511	438 436	405 960	375 888	348 045	322 264	298 392	276 289	255 823	236 873	219 327	203 081	188 038	174 109	161 212
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	129 102	119 538	110 684	102 485	94 893	87 864	81 356	75 330	69 750	64 583	59 799	55 369	51 268	47 470	43 954	40 698
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	1 630 756	1 509 960	1 398 111	1 294 547	1 198 655	1 109 865	1 027 653	951 531	881 047	815 784	755 356	699 403	647 596	599 626	555 209	514 082
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	105 081	97 297	90 090	83 416	77 237	71 516	66 219	61 314	56 772	52 566	48 673	45 067	41 729	38 638	35 776	33 126
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	11 676	10 811	10 010	9 268	8 582	7 946	7 358	6 813	6 308	5 841	5 408	5 007	4 637	4 293	3 975	3 681
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Conservation		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**663 845**	**614 671**	**569 140**	**526 981**	**487 946**	**451 802**	**418 335**	**387 347**	**358 655**	**332 088**	**307 489**	**284 712**	**263 622**	**244 094**	**226 013**	**209 272**
		OPEX		**2 346 472**	**2 172 659**	**2 011 721**	**1 862 705**	**1 724 727**	**1 596 969**	**1 478 675**	**1 369 144**	**1 267 726**	**1 173 820**	**1 086 870**	**1 006 362**	**931 816**	**862 793**	**798 882**	**739 706**
		TOTAL		**3 010 317**	**2 787 330**	**2 580 861**	**2 389 686**	**2 212 673**	**2 048 771**	**1 897 010**	**1 756 491**	**1 626 380**	**1 505 908**	**1 394 359**	**1 291 073**	**1 195 438**	**1 106 887**	**1 024 896**	**948 977**
		REDUCED PAYMENT		**9 052 226**	**8 381 690**	**7 760 824**	**7 185 949**	**6 653 656**	**6 160 793**	**5 704 438**	**5 281 887**	**4 890 636**	**4 528 367**	**4 192 932**	**3 882 344**	**3 594 763**	**3 328 485**	**3 081 930**	**2 853 639**
		ADDITIONAL INCOME		**9 041 869**	**8 372 101**	**7 751 945**	**7 177 727**	**6 646 044**	**6 153 744**	**5 697 911**	**5 275 844**	**4 885 041**	**4 523 186**	**4 188 135**	**3 877 903**	**3 590 651**	**3 324 676**	**3 078 404**	**2 850 374**

			8%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving			**Unit**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Pressure management			m3/annum	371 527	344 006	318 524	294 930	273 083	252 855	234 125	216 782	200 724	185 856	172 089	159 341	147 538	136 610	126 490	117 121
Mains replacement			m3/annum	149 326	138 265	128 023	118 540	109 759	101 629	94 101	87 131	80 676	74 700	69 167	64 044	59 300	54 907	50 840	47 074
Active and passive leakage control			m3/annum	183 283	169 706	157 136	145 496	134 718	124 739	115 499	106 944	99 022	91 687	84 895	78 607	72 784	67 393	62 401	57 778
Retrofitting & removal of wasteful devices			m3/annum	1 304 605	1 207 968	1 118 489	1 035 638	958 924	887 892	822 122	761 225	704 838	652 627	604 285	559 523	518 077	479 701	444 167	411 266
Water Wise Gardening			m3/annum	271 256	251 163	232 558	215 332	199 381	184 612	170 937	158 275	146 551	135 696	125 644	116 337	107 720	99 740	92 352	85 511
Meter reading, billing & cost recovery			m3/annum	1 506 978	1 395 350	1 291 991	1 196 288	1 107 674	1 025 624	949 652	879 307	814 173	753 864	698 022	646 317	598 442	554 113	513 067	475 062
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum	737 411	682 788	632 211	585 381	542 019	501 870	464 694	430 272	398 400	368 889	341 564	316 263	292 836	271 145	251 060	232 463
Total			**m3/annum**	**4 524 387**	**4 189 247**	**3 878 932**	**3 591 604**	**3 325 559**	**3 079 222**	**2 851 131**	**2 639 936**	**2 444 385**	**2 263 320**	**2 095 666**	**1 940 432**	**1 796 696**	**1 663 608**	**1 540 377**	**1 426 275**
Unit reference values																			
All interventions				**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency				4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

Discount rate :	8%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present cost	**Unit**	**2038-39**	**2039-40**	**2040-41**	**2041-42**	**2042-43**	**2043-44**	**2044-45**	**2045-46**	**2046-47**	**2047-48**	**2048-49**	**2049-50**	**2050-51**	**2051-52**	**Total**	**Average**
Sectorisation	CAPEX Rands	6 816	6 311	5 844	5 411	5 010	4 639	4 295	3 977	3 682	3 410	3 157	2 923	2 707	2 506	1 048 672	22 797
	OPEX Rands	8 520	7 889	7 305	6 763	6 262	5 799	5 369	4 971	4 603	4 262	3 946	3 654	3 383	3 133	1 310 840	28 497
Pressure management	CAPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 355 041	72 936
	OPEX Rands	17 040	15 778	14 609	13 527	12 525	11 597	10 738	9 943	9 206	8 524	7 893	7 308	6 767	6 266	2 621 680	56 993
Mains replacement	CAPEX Rands	149 270	138 213	127 975	118 496	109 718	101 591	94 066	87 098	80 646	74 672	69 141	64 020	59 277	54 886	22 965 919	499 259
	OPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control	CAPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OPEX Rands	149 270	138 213	127 975	118 496	109 718	101 591	94 066	87 098	80 646	74 672	69 141	64 020	59 277	54 886	22 965 919	499 259
Retrofitting & removal of wasteful devices	CAPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12 496 134	271 655
	OPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery	CAPEX Rands	37 684	34 892	32 308	29 914	27 699	25 647	23 747	21 988	20 359	18 851	17 455	16 162	14 965	13 856	5 797 774	126 039
	OPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns	CAPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OPEX Rands	476 002	440 743	408 095	377 866	349 876	323 959	299 962	277 743	257 169	238 120	220 481	204 149	189 027	175 025	73 235 035	1 592 066
Water audits / manage KPI's	CAPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OPEX Rands	30 672	28 400	26 296	24 348	22 545	20 875	19 329	17 897	16 571	15 344	14 207	13 155	12 180	11 278	4 719 025	102 587
Management meters	CAPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	671 008	14 587
	OPEX Rands	3 408	3 156	2 922	2 705	2 505	2 319	2 148	1 989	1 841	1 705	1 579	1 462	1 353	1 253	524 336	11 399
Consumer meters	CAPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12 496 134	271 655
	OPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Conservation	CAPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31 240 336	679 138
	OPEX Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**CAPEX**	**193 770**	**179 417**	**166 127**	**153 821**	**142 427**	**131 877**	**122 108**	**113 063**	**104 688**	**96 933**	**89 753**	**83 105**	**76 949**	**71 249**	**90 071 019**	**1 958 066**
	OPEX	**684 913**	**634 178**	**587 202**	**543 706**	**503 431**	**466 140**	**431 611**	**399 640**	**370 037**	**342 627**	**317 247**	**293 747**	**271 988**	**251 841**	**105 376 835**	**2 290 801**
	TOTAL	**878 683**	**813 595**	**753 329**	**697 527**	**645 858**	**598 017**	**553 719**	**512 703**	**474 725**	**439 560**	**407 000**	**376 852**	**348 937**	**323 090**	**195 447 854**	**4 248 866**
	REDUCED PAYMENT	**2 642 258**	**2 446 536**	**2 265 311**	**2 097 510**	**1 942 139**	**1 798 277**	**1 665 071**	**1 541 732**	**1 427 530**	**1 321 787**	**1 223 877**	**1 133 219**	**1 049 277**	**971 553**	**271 262 224**	**5 897 005**
	ADDITIONAL INCOME	**2 639 235**	**2 443 736**	**2 262 719**	**2 095 110**	**1 939 917**	**1 796 219**	**1 663 166**	**1 539 969**	**1 425 897**	**1 320 275**	**1 222 477**	**1 131 923**	**1 048 077**	**970 441**	**321 810 555**	**6 995 882**

	8%	32	33	34	35	36	37	38	39	40	41	42	43	44	45		
Net present saving	**Unit**	**2038-39**	**2039-40**	**2040-41**	**2041-42**	**2042-43**	**2043-44**	**2044-45**	**2045-46**	**2046-47**	**2047-48**	**2048-49**	**2049-50**	**2050-51**	**2051-52**	**Total**	**Average**
Pressure management	m3/annum	108 445	100 412	92 974	86 087	79 710	73 806	68 339	63 277	58 589	54 250	50 231	46 510	43 065	39 875	**11 031 620**	**239 818**
Mains replacement	m3/annum	43 587	40 358	37 369	34 601	32 038	29 665	27 467	25 433	23 549	21 804	20 189	18 694	17 309	16 027	**4 804 644**	**104 449**
Active and passive leakage control	m3/annum	53 499	49 536	45 866	42 469	39 323	36 410	33 713	31 216	28 904	26 763	24 780	22 945	21 245	19 671	**5 897 206**	**128 200**
Retrofitting & removal of wasteful devices	m3/annum	380 802	352 594	326 476	302 293	279 901	259 167	239 970	222 194	205 735	190 496	176 385	163 319	151 222	140 020	**38 737 225**	**842 114**
Water Wise Gardening	m3/annum	79 177	73 312	67 882	62 853	58 198	53 887	49 895	46 199	42 777	39 608	36 674	33 958	31 442	29 113	**8 054 321**	**175 094**
Meter reading, billing & cost recovery	m3/annum	439 873	407 289	377 120	349 185	323 319	299 370	277 194	256 661	237 649	220 046	203 746	188 654	174 679	161 740	**53 635 092**	**1 165 980**
Water Use Efficiency	m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other	m3/annum	215 243	199 299	184 536	170 867	158 210	146 491	135 640	125 592	116 289	107 675	99 699	92 314	85 476	79 145	**21 895 725**	**475 994**
Total	**m3/annum**	**1 320 625**	**1 222 801**	**1 132 223**	**1 048 355**	**970 699**	**898 795**	**832 218**	**770 572**	**713 493**	**660 641**	**611 705**	**566 394**	**524 438**	**485 591**	**144 055 834**	**3 131 649**

Unit reference values																	
All interventions	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**1.4**	**1.4**
Pressure management	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.5
Mains replacement	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	4.8	4.8
ALC & PLC	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.9	3.9
Retrofitting & removal of wasteful devices	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
Water Wise Gardening	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	3.9
Meter reading, billing & cost recovery	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3
Management	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8
Awareness campaigns & Efficiency	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	6.7	6.7

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

				Discount rate :	10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present cost				**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Sectorisation		CAPEX		Rands		80 000	72 727	66 116	60 105	54 641	49 674	45 158	41 053	37 321	33 928	30 843	28 040	25 490	23 173	21 067	19 151
		OPEX		Rands		100 000	90 909	82 645	75 131	68 301	62 092	56 447	51 316	46 651	42 410	38 554	35 049	31 863	28 966	26 333	23 939
Pressure management		CAPEX		Rands		0	454 545	413 223	375 657	341 507	310 461	282 237	256 579	233 254	212 049	192 772	0	0	0	0	0
		OPEX		Rands		200 000	181 818	165 289	150 263	136 603	124 184	112 895	102 632	93 301	84 820	77 109	70 099	63 726	57 933	52 666	47 878
Mains replacement		CAPEX		Rands		1 752 000	1 592 727	1 447 934	1 316 304	1 196 640	1 087 854	988 958	899 053	817 321	743 019	675 472	614 065	558 241	507 492	461 356	419 415
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		1 752 000	1 592 727	1 447 934	1 316 304	1 196 640	1 087 854	988 958	899 053	817 321	743 019	675 472	614 065	558 241	507 492	461 356	419 415
Retrofitting & removal of wasteful devices		CAPEX		Rands		0	1 692 993	1 539 085	1 399 168	1 271 971	1 156 337	1 051 216	955 651	868 773	789 794	717 994	0	0	0	0	0
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX		Rands		442 294	402 086	365 533	332 302	302 093	274 630	249 664	226 967	206 334	187 576	170 524	155 022	140 929	128 117	116 470	105 882
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		5 586 878	5 078 980	4 617 254	4 197 504	3 815 913	3 469 011	3 153 647	2 866 952	2 606 320	2 369 381	2 153 983	1 958 167	1 780 151	1 618 319	1 471 199	1 337 454
Water audits / manage KPI's		CAPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX		Rands		360 000	327 273	297 521	270 473	245 885	223 532	203 211	184 737	167 943	152 675	138 796	126 178	114 707	104 279	94 799	86 181
Management meters		CAPEX		Rands		0	90 909	82 645	75 131	68 301	62 092	56 447	51 316	46 651	42 410	38 554	0	0	0	0	0
		OPEX		Rands		40 000	36 364	33 058	30 053	27 321	24 837	22 579	20 526	18 660	16 964	15 422	14 020	12 745	11 587	10 533	9 576
Consumer meters		CAPEX		Rands		0	1 692 993	1 539 085	1 399 168	1 271 971	1 156 337	1 051 216	955 651	868 773	789 794	717 994	0	0	0	0	0
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Conservation		CAPEX		Rands		0	4 232 483	3 847 712	3 497 920	3 179 927	2 890 843	2 628 039	2 389 126	2 171 933	1 974 485	1 794 986	0	0	0	0	0
		OPEX		Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**				**2 274 294**	**10 231 464**	**9 301 331**	**8 455 756**	**7 687 051**	**6 988 228**	**6 352 934**	**5 775 395**	**5 250 359**	**4 773 054**	**4 339 140**	**797 126**	**724 660**	**658 782**	**598 893**	**544 448**
		OPEX				**8 038 878**	**7 308 071**	**6 643 700**	**6 039 728**	**5 490 662**	**4 991 511**	**4 537 737**	**4 125 215**	**3 750 196**	**3 409 269**	**3 099 335**	**2 817 578**	**2 561 434**	**2 328 576**	**2 116 888**	**1 924 443**
		TOTAL				**10 313 172**	**17 539 535**	**15 945 032**	**14 495 483**	**13 177 712**	**11 979 738**	**10 890 671**	**9 900 610**	**9 000 555**	**8 182 323**	**7 438 475**	**3 614 704**	**3 286 094**	**2 987 359**	**2 715 781**	**2 468 891**
		REDUCED PAYMENT				**341 850**	**3 130 083**	**5 408 538**	**7 246 861**	**8 706 244**	**9 840 394**	**10 696 382**	**11 315 411**	**11 733 489**	**11 982 037**	**11 956 625**	**10 869 659**	**9 881 508**	**8 983 189**	**8 166 536**	**7 424 123**
		ADDITIONAL INCOME				**0**	**5 632 168**	**10 240 306**	**13 964 053**	**16 926 125**	**19 234 233**	**17 485 666**	**15 896 060**	**14 450 964**	**13 137 240**	**11 942 945**	**10 857 223**	**9 870 203**	**8 972 912**	**8 157 192**	**7 415 630**

					10%	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Net present saving				**Unit**		**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Pressure management				m3/annum		0	115 712	210 385	286 889	347 744	395 163	431 087	457 214	475 027	485 823	490 731	446 119	405 562	368 693	335 176	304 705
Mains replacement				m3/annum		51 158	93 015	126 839	153 744	174 709	190 592	202 143	210 019	214 792	216 962	197 238	179 307	163 006	148 188	134 716	122 469
Active and passive leakage control				m3/annum		62 792	114 167	155 682	188 705	214 438	233 932	248 110	257 776	263 635	266 298	242 089	220 081	200 074	181 885	165 350	150 318
Retrofitting & removal of wasteful devices				m3/annum		0	406 318	738 761	1 007 401	1 221 092	1 387 605	1 513 750	1 605 493	1 668 045	1 705 955	1 723 187	1 566 533	1 424 121	1 294 656	1 176 960	1 069 963
Water Wise Gardening				m3/annum		0	84 483	153 605	209 461	253 892	288 513	314 742	333 817	346 823	354 705	358 288	325 717	296 106	269 187	244 716	222 469
Meter reading, billing & cost recovery				m3/annum		0	938 695	1 706 718	2 327 342	2 821 021	3 205 706	2 914 278	2 649 343	2 408 494	2 189 540	1 990 491	1 809 537	1 645 034	1 495 485	1 359 532	1 235 938
Water Use Efficiency				m3/annum		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other				m3/annum		0	229 666	417 575	569 421	690 207	784 326	855 628	907 484	942 841	964 269	974 009	885 463	804 966	731 788	665 261	604 783
Total				**m3/annum**		**113 950**	**1 982 056**	**3 509 564**	**4 742 963**	**5 723 102**	**6 485 837**	**6 479 739**	**6 421 147**	**6 319 657**	**6 183 552**	**5 976 033**	**5 432 757**	**4 938 870**	**4 489 882**	**4 081 711**	**3 710 646**

Unit reference values

All interventions				**90.5**	**8.8**	**4.5**	**3.1**	**2.3**	**1.8**	**1.7**	**1.5**	**1.4**	**1.3**	**1.2**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					5.5	2.7	1.8	1.4	1.1	0.9	0.8	0.7	0.6	0.5	0.2	0.2	0.2	0.2	0.2
Mains replacement				34.2	17.1	11.4	8.6	6.8	5.7	4.9	4.3	3.8	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC				27.9	14.0	9.3	7.0	5.6	4.7	4.0	3.5	3.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					4.2	2.1	1.4	1.0	0.8	0.7	0.6	0.5	0.5	0.4	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					50.1	25.0	16.7	12.5	10.0	8.3	7.2	6.3	5.6	5.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					2.2	1.1	0.7	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.1	0.1	0.1	0.1	0.1
Management					5.4	2.7	1.8	1.3	1.1	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency					44.2	22.1	14.7	11.1	8.8	7.4	6.3	5.5	4.9	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

			Discount rate :	10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present cost			**Unit**		**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Sectorisation		CAPEX	Rands		17 410	15 828	14 389	13 081	11 891	10 810	9 828	8 934	8 122	7 384	6 712	6 102	5 547	5 043	4 585	4 168
		OPEX	Rands		21 763	19 784	17 986	16 351	14 864	13 513	12 285	11 168	10 153	9 230	8 391	7 628	6 934	6 304	5 731	5 210
Pressure management		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		43 526	39 569	35 972	32 702	29 729	27 026	24 569	22 336	20 305	18 459	16 781	15 256	13 869	12 608	11 462	10 420
Mains replacement		CAPEX	Rands		381 286	346 624	315 113	286 466	260 424	236 749	215 226	195 660	177 873	161 703	147 002	133 639	121 490	110 445	100 405	91 277
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		381 286	346 624	315 113	286 466	260 424	236 749	215 226	195 660	177 873	161 703	147 002	133 639	121 490	110 445	100 405	91 277
Retrofitting & removal of wasteful devices		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands		96 256	87 506	79 551	72 319	65 744	59 768	54 334	49 395	44 904	40 822	37 111	33 737	30 670	27 882	25 347	23 043
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		1 215 867	1 105 334	1 004 849	913 499	830 454	754 958	686 325	623 932	567 211	515 646	468 769	426 154	387 413	352 193	320 176	291 069
Water audits / manage KPI's		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		78 346	71 224	64 749	58 863	53 512	48 647	44 225	40 204	36 549	33 227	30 206	27 460	24 964	22 694	20 631	18 756
Management meters		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		8 705	7 914	7 194	6 540	5 946	5 405	4 914	4 467	4 061	3 692	3 356	3 051	2 774	2 522	2 292	2 084
Consumer meters		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Conservation		CAPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**			**494 953**	**449 957**	**409 052**	**371 865**	**338 059**	**307 327**	**279 388**	**253 989**	**230 899**	**209 908**	**190 826**	**173 478**	**157 707**	**143 370**	**130 337**	**118 488**
		OPEX			**1 749 494**	**1 590 449**	**1 445 863**	**1 314 421**	**1 194 928**	**1 086 298**	**987 544**	**897 767**	**816 152**	**741 956**	**674 506**	**613 187**	**557 443**	**506 766**	**460 696**	**418 815**
		TOTAL			**2 244 447**	**2 040 406**	**1 854 915**	**1 686 286**	**1 532 987**	**1 393 625**	**1 266 932**	**1 151 756**	**1 047 051**	**951 865**	**865 331**	**786 665**	**715 150**	**650 136**	**591 033**	**537 303**
		REDUCED PAYMENT			**6 749 203**	**6 135 639**	**5 577 854**	**5 070 776**	**4 609 796**	**4 190 724**	**3 809 749**	**3 463 408**	**3 148 553**	**2 862 321**	**2 602 110**	**2 365 554**	**2 150 504**	**1 955 004**	**1 777 276**	**1 615 706**
		ADDITIONAL INCOME			**6 741 481**	**6 128 619**	**5 571 472**	**5 064 975**	**4 604 522**	**4 185 930**	**3 805 390**	**3 459 446**	**3 144 951**	**2 859 046**	**2 599 133**	**2 362 848**	**2 148 044**	**1 952 767**	**1 775 243**	**1 613 857**

				10%	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Net present saving			**Unit**		**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**2030-31**	**2031-32**	**2032-33**	**2033-34**	**2034-35**	**2035-36**	**2036-37**	**2037-38**
Pressure management			m3/annum		277 005	251 822	228 929	208 118	189 198	171 998	156 362	142 147	129 225	117 477	106 797	97 088	88 262	80 238	72 944	66 313
Mains replacement			m3/annum		111 336	101 214	92 013	83 648	76 044	69 131	62 846	57 133	51 939	47 217	42 925	39 022	35 475	32 250	29 318	26 653
Active and passive leakage control			m3/annum		136 653	124 230	112 936	102 669	93 336	84 851	77 137	70 125	63 750	57 954	52 686	47 896	43 542	39 584	35 985	32 714
Retrofitting & removal of wasteful devices			m3/annum		972 694	884 267	803 879	730 799	664 363	603 966	549 060	499 146	453 769	412 517	375 016	340 923	309 930	281 755	256 141	232 855
Water Wise Gardening			m3/annum		202 244	183 859	167 144	151 949	138 136	125 578	114 162	103 783	94 349	85 771	77 974	70 885	64 441	58 583	53 257	48 416
Meter reading, billing & cost recovery			m3/annum		1 123 580	1 021 437	928 579	844 162	767 420	697 655	634 232	576 574	524 158	476 508	433 189	393 808	358 007	325 461	295 874	268 976
Water Use Efficiency			m3/annum		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other			m3/annum		549 803	499 821	454 383	413 075	375 523	341 384	310 349	282 136	256 487	233 170	211 973	192 703	175 184	159 258	144 780	131 618
Total			**m3/annum**		**3 373 315**	**3 066 650**	**2 787 863**	**2 534 421**	**2 304 019**	**2 094 563**	**1 904 148**	**1 731 044**	**1 573 676**	**1 430 615**	**1 300 559**	**1 182 326**	**1 074 842**	**977 129**	**888 299**	**807 545**
Unit reference values																				
All interventions					**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Pressure management					0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Mains replacement					3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
ALC & PLC					2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Retrofitting & removal of wasteful devices					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Wise Gardening					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meter reading, billing & cost recovery					0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Management					0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Awareness campaigns & Efficiency					4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4

KZN METRO WC/WDM POTENTIAL ASSESSMENT - SCENARIO 3

The Msunduzi Local Municipality

Unit Reference Value (URV) Calculations

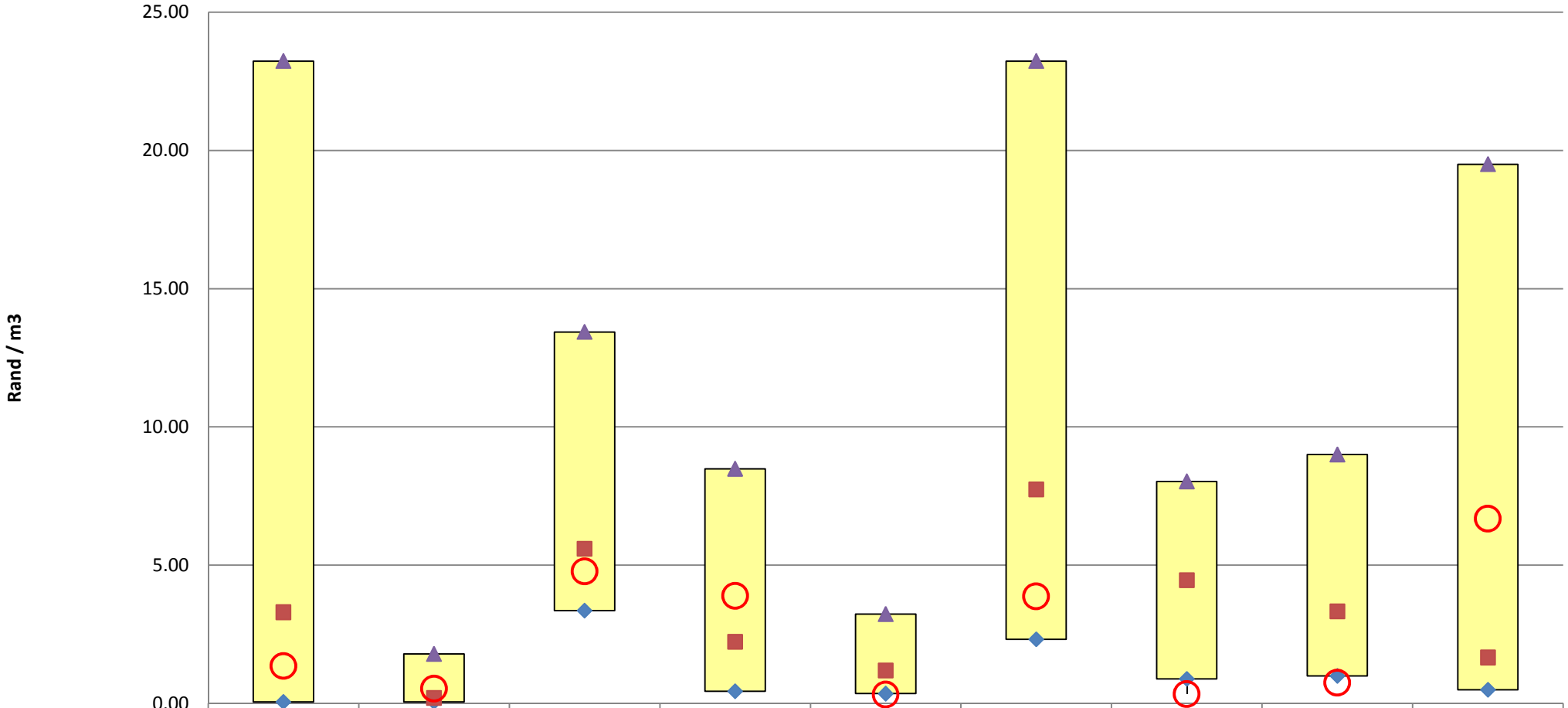
Discount rate : 10%

Net present cost			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Sectorisation		CAPEX	Rands	3 789	3 445	3 131	2 847	2 588	2 353	2 139	1 944	1 768	1 607	1 461	1 328	1 207	1 098	869 025	18 892
		OPEX	Rands	4 736	4 306	3 914	3 558	3 235	2 941	2 673	2 430	2 209	2 009	1 826	1 660	1 509	1 372	1 086 281	23 615
Pressure management		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 072 284	66 789
		OPEX	Rands	9 472	8 611	7 829	7 117	6 470	5 882	5 347	4 861	4 419	4 017	3 652	3 320	3 018	2 744	2 172 562	47 230
Mains replacement		CAPEX	Rands	82 979	75 435	68 578	62 343	56 676	51 523	46 839	42 581	38 710	35 191	31 992	29 084	26 440	24 036	19 031 639	413 731
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Active and passive leakage control		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	82 979	75 435	68 578	62 343	56 676	51 523	46 839	42 581	38 710	35 191	31 992	29 084	26 440	24 036	19 031 639	413 731
Retrofitting & removal of wasteful devices		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11 442 981	248 760
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meter reading, billing & cost recovery		CAPEX	Rands	20 948	19 044	17 313	15 739	14 308	13 007	11 825	10 750	9 772	8 884	8 076	7 342	6 675	6 068	4 804 560	104 447
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Education and awareness campaigns		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	264 608	240 553	218 684	198 804	180 731	164 301	149 364	135 786	123 442	112 220	102 018	92 744	84 312	76 648	60 689 178	1 319 330
Water audits / manage KPI's		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		OPEX	Rands	17 050	15 500	14 091	12 810	11 646	10 587	9 625	8 750	7 954	7 231	6 574	5 976	5 433	4 939	3 910 611	85 013
Management meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	614 457	13 358
		OPEX	Rands	1 894	1 722	1 566	1 423	1 294	1 176	1 069	972	884	803	730	664	604	549	434 512	9 446
Consumer meters		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11 442 981	248 760
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Conservation		CAPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28 607 454	621 901
		OPEX	Rands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		**CAPEX**		**107 716**	**97 924**	**89 022**	**80 929**	**73 572**	**66 883**	**60 803**	**55 275**	**50 250**	**45 682**	**41 529**	**37 754**	**34 322**	**31 202**	**79 885 381**	**1 736 639**
		OPEX		**380 741**	**346 128**	**314 662**	**286 056**	**260 051**	**236 410**	**214 918**	**195 380**	**177 618**	**161 471**	**146 792**	**133 447**	**121 316**	**110 287**	**87 324 783**	**1 898 365**
		TOTAL		**488 457**	**444 052**	**403 683**	**366 985**	**333 623**	**303 293**	**275 721**	**250 656**	**227 869**	**207 153**	**188 321**	**171 201**	**155 637**	**141 489**	**167 210 164**	**3 635 004**
		REDUCED PAYMENT		**1 468 823**	**1 335 294**	**1 213 903**	**1 103 549**	**1 003 226**	**912 024**	**829 112**	**753 739**	**685 217**	**622 924**	**566 295**	**514 814**	**468 012**	**425 466**	**207 669 505**	**4 514 554**
		ADDITIONAL INCOME		**1 467 143**	**1 333 766**	**1 212 515**	**1 102 286**	**1 002 078**	**910 980**	**828 164**	**752 876**	**684 433**	**622 212**	**565 647**	**514 225**	**467 477**	**424 979**	**254 089 427**	**5 523 683**

10%

Net present saving			Unit	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total	Average
Pressure management			m3/annum	60 284	54 804	49 822	45 292	41 175	37 432	34 029	30 935	28 123	25 566	23 242	21 129	19 208	17 462	**8 428 457**	**183 227**
Mains replacement			m3/annum	24 230	22 027	20 025	18 204	16 549	15 045	13 677	12 434	11 303	10 276	9 342	8 492	7 720	7 019	**3 733 404**	**81 161**
Active and passive leakage control			m3/annum	29 740	27 036	24 578	22 344	20 313	18 466	16 787	15 261	13 874	12 613	11 466	10 424	9 476	8 615	**4 582 370**	**99 617**
Retrofitting & removal of wasteful devices			m3/annum	211 687	192 442	174 948	159 043	144 585	131 441	119 492	108 629	98 753	89 776	81 614	74 195	67 450	61 318	**29 596 291**	**643 398**
Water Wise Gardening			m3/annum	44 014	40 013	36 375	33 069	30 062	27 329	24 845	22 586	20 533	18 666	16 969	15 427	14 024	12 749	**6 153 719**	**133 777**
Meter reading, billing & cost recovery			m3/annum	244 524	222 294	202 086	183 714	167 013	151 830	138 027	125 479	114 072	103 702	94 275	85 704	77 913	70 830	**42 348 238**	**920 614**
Water Use Efficiency			m3/annum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Other			m3/annum	119 653	108 776	98 887	89 897	81 725	74 295	67 541	61 401	55 819	50 745	46 131	41 938	38 125	34 659	**16 728 927**	**363 672**
Total			**m3/annum**	**734 132**	**667 392**	**606 720**	**551 564**	**501 422**	**455 838**	**414 398**	**376 726**	**342 478**	**311 343**	**283 039**	**257 309**	**233 917**	**212 652**	**111 571 406**	**2 425 465**
Unit reference values																			
All interventions				**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**1.5**	**1.5**
Pressure management				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.6
Mains replacement				3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	5.1	5.1
ALC & PLC				2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	4.2	4.2
Retrofitting & removal of wasteful devices				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
Water Wise Gardening				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	4.6
Meter reading, billing & cost recovery				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.4
Management				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8
Awareness campaigns & Efficiency				4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	7.3	7.3

KZN METRO WC/WDM POTENTIAL ASSESSMENT
Msunduzi Unit Reference Values - Scenario 3



	All interventions	Pressure management	Mains replacement	Leak detection & repair	Retrofitting	Water Wise	Metering and billing	Management	Awareness campaigns
◆ Ideal conditions	0.06	0.06	3.36	0.44	0.36	2.32	0.89	1.00	0.50
■ Expected conditions	3.30	0.21	5.60	2.23	1.20	7.74	4.46	3.33	1.67
○ Msunduzi	1.36	0.54	4.78	3.89	0.32	3.88	0.34	0.76	6.69
▲ Poor conditions	23.23	1.79	13.43	8.49	3.23	23.23	8.03	9.00	19.50

Appendix C: iLembe District Municipality

WC/WDM Scorecard

Municipal Scorecard for Assessing the Potential for WC/WDM Efforts in Municipalities

Name of Municipality / Water Service Provider: Ilembe District Municipality

Assessment Date: 4 June 2007

Item No.	Description	Max Points	Score	Comments
1	Development of a standard water balance	20	5	Attempt to do a water balance - however many broken meters
2	Pressurised water supply to all customers 100% of the time	20	15	This excludes rural schemes (standpipes)
3	Residential Consumer Meter Reading	20	15	Approximately 90% of consumers are billed
4	Commercial and Industrial Meter Reading	20	15	Majority Kent meters
5	Efficient Leakage Reporting System	20	15	24hr toll free call centre
6	Planned Maintenance of all infrastructure - based on % of network value per annum	20	5	Reactive maintenance only - lack of resources
7	Effective WC/WDM Section in Place	20	5	No WDM section currently
8	Sectorisation of reticulation system in place	20	15	Demand for logging and analysis of the data
9	Control and Boundary Valve Maintenance Programme	10	0	No resources available for this
10	Efficient bulk management metering system in place	10	7.5	Lack of check meters
11	Efficient Zone management metering system in place	10	5	Reservoir outlet meters need to be replaced
12	As built drawings of all bulk and reticulation infrastructure	10	5	HC dwg must be digitised, where no drawings exist these must be generated
13	Pressure management	10	2.5	DM requires funding for this initiative
14	Asset Register	10	5	Umgeni currently supporting to generate an asset register (not comprehensive)
15	Active Leakage Control	10	2.5	No expertise for leakage detection exercise - training & resources required
16	Community Awareness and Education Programmes related to Water Conservation	10	2.5	Only done to launch new projects - no department exists
17	School Awareness and Education Programmes related to Water Conservation	10	2.5	Keen to initiate schools programmes
18	Informative Billing / Itemised Billing	10	10	
19	Newspaper / Radio WDM Education in Place	10	2.5	Good scope for improvement
20	WDM Posters and leaflets for distribution in various languages	10	2.5	Educational material required
	Total	**280**	**137.5**	

Potential WC/WDM Interventions Requested by the Municipality / WSA

There is significant scope for WC/WDM efforts in the DM. The following Projects can be identified. Planned maintenance project, Establishment of a WDM Section followed by training and capacity building, Check meter installation project to check bulk water purchases, Zone / Reservoir Outlet Meter Investigation and Replacement Project, Water infrastructure drawings to be upgraded, Pressure Management Investigation and Implementation Project, Leak detection and Repair Project, Development of a WC/WDM Awareness & Education Department, Develop a PR Person to use the press to Promote WC/WDM.

Municipal Scorecard for Assessing the Potential for WC/WDM Efforts in Municipalities

General

Name of Municipality: **Ilembe District Municipality**
Name of Service Delivery Centre:

Breakdown of Items

1. Development of a standard water balance (20 Points)

WSA has developed reliable water balance and results indicate no problems with UAW at less than 20%	20
WSA has developed reliable water balance and results indicate no problems with UAW at less than 30%	15
WSA has developed reliable water balance and results indicate no problems with UAW greater than 30%	10
WSA has no water balance and no obvious leakage problem	5
WSA has no water balance and has an obvious leakage problem	0

2. Pressurised water supply to all customers 100% of the time (20 Points)

WSA maintains a pressurised supply to all areas within the water distribution network all of the time at a minimum of 20m pressure	20
WSA maintains a pressurised supply to all areas within the water distribution network however pressure drops below 20m in certain areas	15
Small isolated sections of the network experience intermittent supply	10
Many sections of the network experience intermittent supply	5
The entire network experiences intermittent supply	0

3. Residential Consumer Meter Reading (20 Points)

All consumers are metered and billed monthly	20
More than 75% of consumers are metered and billed monthly	15
50 - 75% of consumers are metered and billed monthly	10
Less than 50% of consumers are metered and billed monthly	5
No meter reading or billing takes place	0

4. Commercial and Industrial Meter Reading (20 Points)

All connections to Industrial and Commercial consumers including fire supply connections are metered and accurate.	20
All connections to Industrial and Commercial consumers including fire supply connections are metered, however some meters are not functioning or inaccurate.	15
All connections to Industrial and Commercial consumers excluding fire supply connections are metered, however many meters are not functioning or inaccurate.	10
Some industrial and commercial metering takes place, however many connections are not metered and many meters are not functioning or inaccurate	5
No Industrial / Commercial metering takes place	0

5. Efficient Leakage Reporting System (20 Points)

Efficient and reactive leakage reporting system in place (telephone number is well advertised, reported leaks are dealt with within 24hr's)	20
Efficient and reactive leakage reporting system in place (telephone number is well advertised, reported leaks are dealt with within 48hr's)	15
leakage reporting system in place response times need to be improved	10
leakage reporting system in no response units in place	5
No leakage reporting system in place and no plans to create a leakage reporting system.	0

6. Planned Maintenance of all infrastructure - based on % of network value per annum (20 Points

2% or more of the value of the water network is invested annually into the maintenance of the infrastructure	20
1.5% - 2% of the value of the water network is invested annually into the maintenance of the infrastructure	15
1.0% - 1.5% of the value of the water network is invested annually into the maintenance of the infrastructure	10
0.5% - 1.0% of the value of the water network is invested annually into the maintenance of the infrastructure	5
0% - 0.5% of the value of the water network is invested annually into the maintenance of the infrastructure	0

7. Effective WC/WDM Section in Place (20 Points)

Efficient WDM Section in place	20
WDM section requires some capacity building and training	15
Inefficient WDM section in place	10
No WDM section currently in place, intention to create WDM section	5
No WDM Section and no intention to create WDM section	0

8. Sectorisation of reticulation system in place (20 Points)

Reticulation is comprehensively sectorised into pressure zones which are all discrete. Flows and pressures in each are monitored monthly	20
Reticulation is comprehensively sectorised into pressure zones which are all discrete. Flows and pressures in each are not monitored	15
Reticulation is sectorised in theory, however, zone discreteness needs to be verified and confirmed	10
Plans exist indicating designed pressure zones, however these are no longer in place practically	5
No Discrete pressure zones or drawings indicating the proposed pressure zones exist	0

9. Control and Boundary Valve Maintenance Programme (10 Points)

All control valves and boundary valves are visited bi-annually to verify correct operation and serviced at least every five years.	10
All control valves and boundary valves are visited annually to verify correct operation and serviced when operation fails	7.5
Control valves and boundary valves are visited and serviced on and ad-hoc basis	5
Control valves and boundary valves are seldom visited	2.5
Control valves and boundary valves are never visited or serviced	0

10. Efficient bulk management metering system in place (10 Points)

All bulk inlets to the WSA are accurately metered by the WSA. (i.e. check meters are in place)	10
All bulk inlets to the WSA are metered by the Bulk water supplier or by the WSA	7.5
Few bulk meters are operational	5
No Bulk metering in place however a proposal to install bulk metering	2.5
No Bulk metering in place and no plans for any	0

11. Efficient Zone management metering system in place (10 Points)

All inlet points to discrete zones are metered and accurate	10
All inlet points to discrete zones are metered some meters are not functioning or are inaccurate	7.5
All inlet points to discrete zones are metered. Majority meters are not functioning or are inaccurate	5
Zone inputs are currently not metered. The WSA intends creating District Metered Areas (DMA's) / Zones and installing zone meters.	2.5
No accurate Zone metering in place and not intention of installing zone metering	0

12. As built drawings of all bulk and reticulation infrastructure (10 Points)

Accurate as-built drawings for all reticulation available digitally	10
As-build drawings available digitally for the majority of the network. as-built drawings available in hard copy for the remainder of the network	7.5
A mixture of digital and hard copy as-built drawings available for the majority of the network.	5
Hard copy as-built drawings available for portions of the network	2.5
No as-built drawings available	0

13. Pressure management (10 Points)

Comprehensive pressure management studies have been conducted, implemented and are being maintained within the municipality	10
Some pressure management studies have been conducted, implemented in certain areas within the municipality. Maintenance of these installations can be improved	7.5
Pressure management studies have been conducted but as yet have not been implemented or there is no scope for pressure management	5
No pressure management studies have been conducted however reservoir, tower and direct supply zones are kept discrete.	2.5
Pressure management has never been investigated or implemented within the municipality	0

14. Asset Register (10 Points)

WSA has a comprehensive and accurate asset register in place which is available digitally	10
WSA has a reasonably comprehensive and accurate asset register in place in hard copy	7.5
WSA has a poor asset register	5
WSA is in the process of developing an asset register	2.5
WSA has no asset register in place and no immediate intention of generating an asset register	0

15. Active Leakage Control (10 Points)

Active leakage detection undertaken continuously with efficient response to leaks detected	10
Active leakage detection undertaken continuously, response to leaks detected can be improved	7.5
Active leakage detection is done, usually by external consultants / contractors, Leaks reported are documented and repaired when staff are available	5
No active leakage detection is currently done however the WAS intends to conduct active leakage detection exercises	2.5
No active leakage detection is done and no intention to conduct active leakage detection	0

16. Community Awareness and Education Programmes related to Water Conservation (10 Points

WSA is actively involved in conducting workshops on water conservation within the communities with a dedicated team	10
WSA is involved in conducting workshops on water conservation within the communities however no dedicated team exists	7.5
WSA has very little involvement with workshops on water conservation within the communities	5
WSA currently does not conduct workshops on water conservation within the communities, however these interventions are proposed	2.5
WSA currently does not conduct workshops on water conservation within the communities	0

17. School Awareness and Education Programmes related to Water Conservation (10 Points)

WSA is actively involved in conducting workshops on water conservation within the schools with a dedicated team	10
WSA is involved in conducting workshops on water conservation within the schools however no dedicated team exists	7.5
WSA has very little involvement with workshops on water conservation within the schools	5
WSA currently does not conduct workshops on water conservation within the schools, however these interventions are proposed	2.5
WSA currently does not conduct workshops on water conservation within the schools	0

18. Informative Billing / Itemised Billing (10 Points)

WSA produces informative, itemised billing. Indicating the water tariff structure and itemises the volumes of water consumed under each tariff	10
WSA itemises total consumption and free basic water only and indicate the water tariff structure on the bill	7.5
WSA itemises total consumption and free basic water only	5
WSA presently does not have itemised billing but intends developing an itemised billing	2.5
WSA has no informative or itemised billing	0

19. Newspaper / Radio WDM Education in Place (10 Points)

WSA regularly (at least once a month) runs programmes on the local Radio and has advertisements in the local press promoting Water Conservation	10
WSA runs programmes on the local Radio and has advertisements in the local press promoting Water Conservation every 1 - 6 months	7.5
WSA occasionally (at least once a year) makes use of local radio **or** has advertisements in the local press promoting water conservation	5
WSA seldom (less than once a year) makes use of local radio **or** has advertisements in the local press promoting water conservation	2.5
WSA does not make use of Radio or the local press to promote the importance of Water conservation at all	0

20. WDM Posters and leaflets for distribution in various languages (10 Points)

WSA has an extensive library of educational posters and leaflets dealing with water conservation issues in at least three languages	10
WSA has a library of educational posters and leaflets dealing with water conservation issues in at least two languages	7.5
WSA has a library of educational posters and leaflets dealing with water conservation issues in only one language	5
WSA has no educational posters or leaflets but intends producing these	2.5
WSA has no educational posters or leaflets and has no intention of producing these	0

Comments / Interventions proposed by the WSA / Municipality

DM suggested that the questionnaire needs to capture a political dimension. This should focus on the involvement of political counsellors in water projects. This is important because political councillors are influential in areas that they are based in (have jurisdiction over). It is also the channel that the communities and councillors do expect to be adhered to.