



Water Services Development Plan

Ekurhuleni Metropolitan Municipality

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LIST OF ABBREVIATIONS

AADD	-	Annual Average daily demand
AFU	-	Automatic Flushing Urinal
CES	-	Community Engineering Services
CMIP	-	Consolidated Municipal Infrastructure Program
CU	-	Consumer Unit
DM	-	Demand Management
DWAF	-	Department of Water Affairs and Forestry
EIA	-	Environmental Impact Assessment
EMM	-	Ekurhuleni Metropolitan Municipality
ERWAT	-	East Rand Water Care Company
I&AP	-	Interested and Affected Party
IDP	-	Integrated Development Plan
IWRMP	-	Integrated Water Resource Management Plan
PDG	-	Palmer Development Group
RW	-	Rand Water
SDC	-	Service Delivery Centre
SDR	-	Service Delivery Region
SIWRMP	-	Strategic Integrated Water Resource Management Plan
UAW	-	Unaccounted For Water
VIP	-	Ventilated Improved Pit Latrine
WDM	-	Water Demand Management
WRDP	-	Water Resource Development Plan
WRM	-	Water Resource Management
WSDP	-	Water Services Development Plan
WTW	-	Water Treatment Works
WWTW	-	Wastewater Treatment Works

LIST OF IMPORTANT DEFINITIONS PERTINENT TO THE WSDP

Consumer Unit	Any end user or client who receives water services from a water services institution, including an end user in an informal household.
Water Services Authority	Any municipality, including a district or rural council responsible for ensuring access to water services.
Water Services Provider	Any person who provides water services to a consumer unit or to another water services institution.
Water Services	Includes both water supply and sanitation (wastewater) services.
Basic Sanitation (Wastewater)	The prescribed minimum standard of services necessary for the safe, hygienic and adequate collection, removal, disposal or purification of wastewater from households incl. informal consumer units. (A ventilated improved pit latrine or equivalent has been defined as the basic wastewater service level.)
Basic Water Supply	The prescribed minimum standard of water supply services necessary for the reliable supply of a sufficient quantity and quality of water to consumer units incl. informal households. (A communal tap (water) within 200 m walking distance is regarded as a basic service level).

Executive Summary

INTRODUCTION

Ekurhuleni Metropolitan Municipality herewith presents the Water Services Development Plan (WSDP) as required by the Water Services Act (108, 1997) with the main objective to ensure effective, viable and sustainable Water and Wastewater services. Community Engineering Services (CES) assisted with the compilation of the WSDP, utilising the information from the previous WSDP, Water and Sewer Master Plans, as well as consultation with officials and role players.

In order to ensure integrated action within the departments of the Ekurhuleni Metropolitan Municipality, the Water Services Division initiated a WSDP forum, consisting of representatives of all affected departments, including the IDP Co-ordinator. Consultation through the forum ensured buy-in from all role-players and helps with the establishment of the principle that this plan is not just a water sector document, but an integrated process to draft a sectoral plan, which will form part of and inform the full IDP for EMM. The issues as summarised in Chapter 10 of this report and the recommended initiatives/strategies for improving water services delivery should be included in the IDP.

The updating of the water and sewer master plans was underway during the writing of this report. The master planning is scheduled to be completed by mid 2007. The final results could therefore not be incorporated into this WSDP. Where possible, the latest available information (i.e. since previous WSDP) has been included.

A brief summary of the WSDP is herewith presented.

Setting the Scene

The Ekurhuleni Metropolitan Municipality (EMM) is located in the Gauteng Province on the East Rand and was formed in 2000 from the joining of the several local municipalities of the former East Rand. It is one of the 6 metropolitan municipalities in the South Africa, and it is known as the industrial hub of the country. The Ekurhuleni Metro was created through the consolidation of 9 former local councils and small portions of Midrand and Bronberg within the former Eastern Gauteng Services Council and Khayalami Metropolitan Municipality administrative areas. The Ekurhuleni area has been subdivided into 3 service delivery regions (SDR), i.e. the Northern, Southern and Eastern SDR.

It covers approximately 1923km² and has an average elevation above mean sea level of 1600 m. The EMM is surrounded by the Tshwane Metropolitan Municipality, Johannesburg Metropolitan Municipality, Lesedi, Metsweding District Municipality and Gert Sibande District Municipality. EMM is within the Uppervaal water catchment management area, the Olifants- and Crocodile West water catchment management area and it is part of the Jukskei-, Kliprivier and Blesbokspruit water catchments.

The EMM area covers most of the historical mining area. The geology of the area therefore is typical of the specific nature and formation associated with these activities. Of serious impact is the dolomitic nature of the area, which is relatively active in areas such as Katlehong, Tokoza and the north east areas of Kempton Park (i.e Pomona, Bredell, Hartebeestfontein and Olifantsfontein). A further impact is the fact that the area is also underlain with shallow mining, such as in the so-called mining belt – Germiston to Boksburg.

Rand Water (RW) and the East Rand Water Care Company (ERWAT) are the major bulk water services providers in the area. Ekurhuleni also purchases water from adjacent Water Services Authorities, including City of Johannesburg, although this makes up a small proportion of the water purchases.

Consumer Profile

Various sources provide different estimates for the total population of Ekurhuleni. This WSDP estimates the total population at between 2.55 million and 3.2 million. The future population growth rate is dependant on a number of factors of which the most significant are the impact of Aids, economic growth, the creation of housing opportunities through Dept. of Housing initiatives and urbanisation. New major housing initiatives, which could lead to an addition of 130 000 to 230 000 housing opportunities in the medium term (4 to 5 years), poses a potential risk in the continued provision of sustainable water services. This will have to be investigated and fully and reported on in the master plans and the next WSDP.

There are an estimated 480 000 consumer units (CU), with 6 400 industrial CU and 1600 commercial/business CU. Based on the predicted developments as identified from the master plans, the number of CU will increase to 752 600, representing an additional 27 600 ha of developed land. When assuming a population growth rate of between 2 and 2.5%, it implies that the implementation period for all the future developments identified is 25 –30 years. If the Housing delivery expands as rapidly as envisaged, considering the figures as quoted above, the projected development period of 25 to 30 years will be reduced drastically, and expenditure on infrastructure would need to be expedited to the extreme.

EMM needs to finalise and adopt an Integrated Water Resource Management Plan, which amongst other elements, stresses the municipality's role in ensuring the economic viability of the local area. In order to ensure a viable Metropolitan Municipality, economic upliftment of the areas is essential.

STATUS OF EXISTING MASTER PLANS

Master plans for Water and Wastewater conveyance for Ekurhuleni was done in 2002. Progress regarding the List of Issues that were identified in the plan, were revisited and updated in a 2004 review. The Consulting engineering firm CES, was appointed late in 2005 to prepare updated master plans as well as this WSDP, with the delivery date for the master plans of June 2007. These plans are currently being prepared, with the information being required currently being gathered and captured before the modelling stage can proceed.

Service Levels

Service levels in the existing formal developed areas (excluding rural areas) generally meet the minimum standards as required by the Water Services Act 108 (of 1997), i.e. communal standpipe within 200 m walking distance and ventilated improved pit latrine (VIP) or equivalent.

The policy for formalized service provision (permanent services) remains that services are provided through the housing programme to formally developed housing areas. Through the application of this policy, services are provided to an ever increasing number of people. Informal housing areas are considered to be transitory, i.e. the affected families to be services through the eventual transfer to formally serviced sites. Temporary services are continued to be provided to these transit areas.

The strategy for provision of future services is as follows:

- a) The status quo of current CU with yard taps will be retained.
- b) All new CU will be provided with metered on-site water and waterborne wastewater of sufficient quality and quantity as required by the Act.
- c) Where current CU have none or inadequate services, these will be relocated to formal housing projects according to the Housing Department's Migration Plan.
- d) Where this is not possible, or in the interim, temporary or emergency services will be provided.

- e) The elimination of the services “backlog” will be addresses by attempting to keep the base “backlog” of unserved CU constant. As the “backlog” is continuously replenished through the effects of growth and migration to the Metro, this implies that the true backlog is zeroed while growth is accommodated continuously.
- f) Lower service levels should not be considered under normal circumstances. Only if reasonable proposals still cannot provide a sustainable financial situation, should the lowering of service level be investigated for new CU. This should only be considered as a temporary measure and in cooperation with the Province, while an acceptable permanent solution is being found.
- g) In the urban periphery, no formal services would be provided on private land. A basic wastewater service will be provided, as defined according to the Act, to all CU on Council owned land.

Throughout, service provision takes cognisance of the risk due to the presence of dolomite, and services are provided according to the Risk Management system and policy.

Water Resources

Rand Water (RW) and Johannesburg Water (JW) are the two bulk providers of potable water services, and together with the East Rand Water Care Company (ERWAT) are the Bulk Water Services Providers in the area. Bulk water is abstracted mainly from the Vaal River System, which is augmented by the Lesotho Highlands Scheme, and feeds the bulk supply system of RW. There are 133 Rand Water connections and a further 3 Johannesburg Water connections, of which 26 RW connections supply CU directly in the Ekurhuleni area. Some groundwater and surface water extraction takes place in the urban peripheral and rural areas.

Water Demand

The previous WSDP indicated that the total water demand would increase to 725 MI/d when the existing developments (at the time) were fully occupied and will increase further to 1 124 MI/d when all the future developments identified are occupied. A potential growth period of approximately 20 years was estimated should the growth rate be maintained.

Current total water demand is already at 793 MI/d, growing from 752 and 775 in the previous two years. This indicates that growth has escalated and that the 20 year predicted time frame will decrease drastically. The future demand will be quantified fully with the new master plans which will be completed by June 2007. The potential increased demand due to accelerated housing provision will further negatively affect this trend.

In November 2005, the Ekurhuleni Council adopted a Water Demand Management Strategy (WDMS) that was implemented by the Municipal Infrastructure Department: Water Services to conserve the water resources, to use water more effectively and to implement measures to promote water conservation and demand management, in terms of its obligations from the Water Services Act 108 (1997) and National Water Supply Regulations. Through this strategy, it is striven for to counter the impact of the high growth rate and to provide water services in sustainable fashion.

Water Quality

The water quality of the potable water is monitored by EMM and Rand Water. The Regions also have their independent monitoring programmes in the water services networks, like reservoirs, streams, wetlands and dams. The responsibility for water quality is not solely that of the Municipal Infrastructure Department (Water Services Division), but should be shared by other departments.

Some of the challenges affecting water quality management are:

- Budget constraints,
- Identification of other pollution sources, e.g. backyard industrial activities that affects stream and rivers.
- Implementation and coordination of comprehensive surface water and borehole water quality programs through departmental committees.
- Implementation of a programme that will involve all stakeholders for rehabilitation of some streams and rivers within Ekurhuleni Metropolitan Municipality.

Some projects that are proposed for inclusion into a Water Quality Strategy are,

- Assessment of ecological state of major rivers and streams,
- Borehole census and ground water assessment,
- Investigation of certain chemical spillages that may require further assessment in terms of their penetration abilities and effect on the environment,
- Investigation of infiltrate into and ex-filtrate of sewage in sewer conveyance lines.

The Health Departments also assists by dealing with:

- Visible Pollution incidences from industries during routine inspections,
- Complaints on blocked sewerage systems and from industries,
- Smell investigation from polluted water.

Some pollution of stormwater and run-off occurs, e.g. at Jan Smuts dam and Steward Pan. Detailed studies were undertaken and some solutions recommended. These are included amongst the issues as identified in this WSDP.

A recent outcry regarding an alleged presence of “rat-tailed” maggots in drinking water is unfounded, such an occurrence being impossible in a distribution system as in EMM.

Wastewater Effluent

The East Rand Water Care Company (ERWAT) provides the main outfall sewers and operates most of the water care works in the area. According to figures provided by ERWAT, the average dry weather flow (ADWF) from the WCW's is 478MI/d and the wet weather flow (WWF) is 550MI/d. The ADWF figure compares well with an estimated expected return of 449 MI/d based on the annual water sales, which therefore implies that little stormwater ingress or infiltration takes place.

Water Demand Management

The estimated unaccounted-for-water (UAW) in the Ekurhuleni area is 18 % or approximately 55 000 MI/y which amounts to a total loss of R174,4 mil revenue based on the bulk water unit cost of R3.17/kl (2005/2006 tariff). This is down from the 22% losses reported in the previous WSDP. The Municipal Infrastructure Department (Water Services Division) has undertaken a Water Demand Management Programme according to section 4.7 of the previous Water Services Development Plan (WSDP) (March 2002). Various ad hoc projects have been implemented as part of the water demand management program including pressure management, metering programs, leak detection, bulk zone metering etc., which has resulted in this decrease. The WDM Program is discussed in detail in the main body of this report.

As mentioned above, the Ekurhuleni Council adopted a Water Demand Management Strategy (WDMS) in November 2005. The objective of the strategy is to entrench Water Demand Management as a key service delivery strategy. The key focus areas for implementation of the WDMS are effective meter management, reduction in consumer demand and the implementation of a sustainable water loss strategy.

Water Supply Service Infrastructure

The water supply infrastructure consists of 63 reservoirs and 28 water towers, which provide a total storage of 934 ML. There are also 35 pumping stations, approximately 8 675km of pipelines and 146 distribution zones in the Ekurhuleni Metro. The estimated replacement cost (year 2002 values excluding the costs of the CU connections) for the water supply infrastructure is R2 500 mil. Many components are reaching the end of their functionality and upgrading and replacement programmes need to be implemented as a matter of urgency to prevent the total collapse of existing infrastructure. The new Master Plan study, currently underway, will provide an up-to-date assessment of the status and value of the infrastructure network.

Wastewater Services Infrastructure

The wastewater infrastructure consists of approximately 7250 km of pipelines and 138 pumping stations. The area currently drains to 17 water care works, which are all operated and maintained by ERWAT. The Welgedacht WCW, also serves Benoni and replaces the McComb works which has been closed down.

The estimated replacement cost (year 2002 values) of the Ekurhuleni wastewater infrastructure (pumping stations and pipelines incl. all manholes) is R3 000 mil. The replacement cost of the WCW (ERWAT) is R 2 380 mil.

Future Infrastructure Requirements

Projects necessary to ameliorate existing problems, to cater for the growth in demand and to replace ageing infrastructure have been discussed in detail in the previous master plans. Some of these projects have been completed since, while some are in progress. The detailed projects are reflected in the current budget and are included in the list of projects, attached hereto as Appendix B. These will be reviewed in the new Master Plan, which will produce an updated program for the expansion to infrastructure that is required.

Long-term strategic plans by ERWAT, as according to their Strategic Facilities Development Plan (May 2000), indicate that the elimination of Dekema WCW is under investigation. The greatest capacity requirement exists in Drainage District 6, i.e. the Alberton-, Boksburg-, Germiston area. To alleviate this need, a 50 ML/day extension at the Waterval WCW is under construction, which is also funded by MIG Grant Funds and is intended to be operational by January 2008.

Assuming a useful life of maximum 50 years for major infrastructure, it stands to reason that the total water services infrastructure network needs to be replaced in a 50 years cycle, implying that approximately R45 mil needs to be spent annually on asset replacement (2002 estimate) for water and R53 million per annum (2002 estimate) on wastewater infrastructure. The detailed proposals dealing with these requirements will be reflected in the new Master Plan, together with the requirements due to growth and expansion.

Operating Expenditure

The table below contains a summary of expenditure and income on the operating account for water and wastewater services, indicating the three previous years (from 2003/04) and estimates for the future two years (until 2008/09).

	BUDGET ANNUAL 2003/04	BUDGET ANNUAL 2004/05	BUDGET ANNUAL 2005/06	BUDGET ANNUAL 2006/07	% of Total	BUDGET ANNUAL 2007/08	BUDGET ANNUAL 2008/09
INCOME							
User Charges for Services	R 1,171,649,919	R 1,315,940,072	R 1,437,186,447	1,596,387,582	97%	1,676,206,960	1,760,017,340
Fines	R 500,000	R 265,000	R 272,948	250,000	0%	262,500	275,670
Operating Grants & Subsidies	R 0	R 118,610,955	R 50,000,000	47,703,000	3%	24,075,790	13,650,000
Other Income	R 837,659	R 12,700	R 10,296	1,209,900	0%	1,270,450	1,334,000
OPERATING INCOME GENERATED	R 1,172,987,578	R 1,434,828,727	R 1,487,469,691	1,645,550,482	100%	1,701,815,700	1,775,277,010
Less: Income foregone	R 0	R 0	R 0	-		-	-
TOTAL OPERATING INCOME	R 1,172,987,578	R 1,434,828,727	R 1,487,469,691	1,645,550,482	100%	1,701,815,700	1,775,277,010
Internal Recoveries	R 1,066,312,536	R 953,011,125	R 958,280,649	18,137,940		19,044,820	19,997,060
Internal Transfers - sub-total	R 1,066,312,536	R 953,011,125	R 958,280,649	18,137,940		19,044,820	19,997,060
NET OPERATING INCOME	R 2,239,300,114	R 2,387,839,852	R 2,445,750,340	1,663,688,422		1,720,860,520	1,795,274,070

	BUDGET ANNUAL 2003/04	BUDGET ANNUAL 2004/05	BUDGET ANNUAL 2005/06	BUDGET ANNUAL 2006/07	% of Total	BUDGET ANNUAL 2007/08	BUDGET ANNUAL 2008/09
EXPENDITURE							
Employee Related Costs - Salaries & Wages	R 88,945,127	R 100,910,143	R 106,981,432	113,400,310	7%	119,070,380	125,023,900
Employee Related Costs - Social Contributions	R 22,817,568	R 27,087,643	R 28,712,900	30,435,700	2%	31,957,490	33,555,430
Bad Debts (Provision for Bad Debts)	R 177,414,884	R 182,200,000	R 214,185,874	160,274,130	10%	168,287,840	176,702,230
Depreciation	R 0	R 0	R 0	32,000,000	2%	32,000,000	32,000,000
Repairs and Maintenance - External	R 57,065,013	R 49,821,887	R 62,354,251	112,192,758	7%	120,046,330	128,449,820
Repairs and Maintenance - Internal	R 4,106,600	R 7,552,494	R 8,373,458	6,180,298	0%	6,489,320	6,813,820
Bulk Purchases	R 815,000,000	R 908,064,412	R 971,193,799	1,050,000,000	64%	1,123,500,000	1,202,145,000
Contracted Services	R 54,994,945	R 74,191,133	R 31,553,470	36,149,000	2%	39,040,920	42,164,180
Grants & Subsidies Paid	R 0	R 0	R 50,000,000	-	-	-	-
General Expenses - Other	R 9,470,881	R 136,305,538	R 26,341,450	90,422,400	6%	53,943,670	33,540,780
TOTAL OPERATING EXPENDITURE	R 1,229,815,018	R 1,486,133,250	R 1,499,696,634	1,631,054,596	100%	1,694,335,950	1,780,395,160
Internal Transfers:							
Interest - Internal Borrowings	R 32,253,302	R 0	R 0	-	-	-	-
Redemption - Internal Borrowings	R 23,336,064	R 0	R 0	-	-	-	-
Internal Charges	R 1,013,125,869	R 1,003,693,479	R 1,033,331,642	30,610,383		44,152,620	45,439,022
Internal Transfers - sub-total	R 1,068,715,235	R 1,003,693,479	R 1,033,331,642	30,610,383		44,152,620	45,439,022
NET OPERATING EXPENDITURE	R 2,298,530,253	R 2,489,826,729	R 2,533,028,276	1,661,664,979		1,738,488,570	1,825,834,182
OPERATING SURPLUS/(DEFICIT)	-R 59,230,139	-R 101,986,877	-R 87,277,936	2,023,443		(17,628,050)	(30,560,112)
Contribution to Capital Budget	R 12,225,845	R 14,000,000	R 0	-		-	-
Total Transfers to Cash-Backed Reserves	R 0	R 0	R 0	47,703,000		24,075,790	13,650,000
Total Transfers from Cash-Backed Reserves	R 0	R 798,274	R 0	-		-	-
Unappropriated Surplus/ (Deficit)	-R 71,455,984	-R 115,188,603	-R 87,277,936	(45,679,557)		(41,703,840)	(44,210,112)

For the previous three years, the actual expenditure, as a percentage of the budgeted amounts, was:

2002/03 -	96,02%
2003/04 -	98,94%
2004/05 -	91,09%
2005/06 -	74,80% (*to date, for the first three quarters).

The majority of the operating cost is contributed by the purchasing of bulk water from RW and the levies charged by ERWAT for the treatment of effluent.

Tariffs

The National Water Act of 1998 identifies four primary national water pricing goals, i.e.:

- *Improving social equity*
- *Ensuring ecological sustainability*
- *Ensuring financial sustainability*
- *Improving efficiency*

The broad principles used in the compilation of the tariffs to promote the attainment of the tariff setting goals are:

- Tariffs to be based on “efficient costs” (cost to run the water service in a cost effective and efficient manner)
- Payment to be in proportion to the amount of water consumed. This will promote the more efficient use of water, compared to tariffs which have a large fixed cost component
- Tariffs should promote the development of competitive business, thus the commercial tariffs should not be loaded with cross-subsidy requirements.

A summary of the details of the domestic and industrial tariffs for water and wastewater are shown below.

Water

Domestic Tariff:

Block tariff (kl)	Tariff (Rands)
0-6	0
7-15	5.35
16-30	6.40
31-45	7.85
46-60	8.25
61>	9.00

Other Usage Tariff:

Block tariff (kl)	Tariff (Rands)
0-200	7.40
201-1000	7.30
1001-2500	7.00
2501-5000	6.90
5001-25000	6.70
25001-50000	6.20
>50000	6.15

Wastewater

Domestic Tariff:

Block tariff (kl)	Tariff (Rands)
0-6	0
7-15	3.73
16-30	1.20
31-45	1.15
46-60	1.10
61>	0.20

Other Usage Tariff:

Block tariff (kl)	Tariff (Rands)
0-200	3.95
201-1000	3.15
1001-2500	1.75
2501-5000	0.80
5001-25000	0.75
25001-50000	0.70
>50000	0.25

Other features of the latest tariff structure are:

- the increase of the free basic water allocation to 9kl (both water and wastewater) for registered indigents, and
- wastewater charges being for the user's account, and not the property owner's account, thus encouraging saving by the user.

A maintenance levy was introduced in the 2005/2006 financial year, with the funds raised through the levy (estimated at R12 million) being "ring-fenced". The income resulting from this "levy" is used exclusively for refurbishment of the existing water and wastewater reticulation schemes in Ekurhuleni. The aim of these funds is to limit increased capital expenditure and increased reactionary maintenance expenditure.

Capital Expenditure Program

A three-year capital expenditure program has been prepared by the Ekurhuleni Manager: Water & Wastewater based on the requirements of the Service Delivery Regions and the Master Planning output. Summaries of the three year budget, giving the proposed expenditure summarised in terms of IDP Strategies, Metro objectives, Impact areas, Service Delivery Regions, etc. are presented in the main body of the report. The detail list of all the projects is attached at the end of this document as Appendix B.

The total capital expenditure for the water and wastewater functions, as budgeted for the next three years, amounts to R268 388 790. This is far removed from the approximately R 1 billion (5-years) that was reported in the previous WSDP (2002). The budget for the next financial year, from all funding sources, is R 107 703 000. Considering the size of the Metro and the service need, these funds are inadequate to ensure sustainable service delivery and the addressing of the backlog.

The capital expenditure per GFS sub-class are as follows:

GFS Sub-Class	2006/2007	2007/2008	2008/2009	Project Total
Sewerage Sub-Total	31,989,000	30,670,790	31,430,000	94,089,790
Water Distribution Sub-Total	72,247,000	53,015,000	42,852,000	168,114,000
Water Storage Sub-Total	3,467,000	1,350,000	1,368,000	6,185,000
Total Budget	107,703,000	85,035,790	75,650,000	268,388,790

Institutional Aspects

The Ekurhuleni Metropolitan Municipality (EMM) was formed in 2000 through the joining of the several local municipalities of the former East Rand into one of the six metropolitan municipalities in South Africa.

The provision of bulk services is undertaken by external service providers like Rand Water and ERWAT. In the Ekurhuleni Metropolitan Municipality, water services are delivered under the auspices of the Executive Director: Municipal Infrastructure. More directly, these services are provided by two Directors in Water Services, namely Planning and Construction and Operations, with their respective staff. Services are further delivered locally by three Regional Directors within the whole of Ekurhuleni. Thus the total service is delivered through a head office/corporate component, with operations delivered through the offices of three Service Delivery Regions (SDRs), i.e. the North, South and East regions respectively.

In the broader context other departments like Health, Environment Planning, Finance, Marketing and Communications contribute to the delivery of water services, while delivery takes place through various forums and committees.

Environmental Aspects

Rand Water provides the bulk water and is responsible for the planning and monitoring of the water resource utilised. ERWAT is the responsible for treating and monitoring the effluent discharged into the river systems. The DWAF is the custodian of water in South Africa and the responsibility for the protection of the water resource should be shared by all role players.

The Metro is also responsible to monitor the quality and protect the resources in the municipal boundaries of the Metro. While the quality of surface water is monitored on a monthly basis, very little attention is given to ground water protection and the role of different departments needs to be identified in this regard.

During 2002, a State of the Environment Report (SoER) was compiled by the EMM with the purpose of providing environmental information to decision-makers to make informed decisions. The EMM embarked on a process to formulate a Strategic Integrated Water Resource Management Plan (SIWRMP). The purpose of the SIWRMP is to strike the right balance between development needs and service delivery, in the interest of human health and well-being, whilst ensuring environmental integrity in terms of stormwater management, waste management, pollution control, and resource conservation. Striking this balance is challenging and it requires all spheres of the government to participate. The SIWRMP will be utilised for protection, rehabilitation and management of the water resource within and around Ekurhuleni Metro Municipality.

The Ekurhuleni SIWRMP is still in the process of being finalised, with some chapters still being drafted. Chapters will include a strategy for protection of water resources within EMM, strategies and requirements for monitoring, sampling and pollution management, a discussion of the relevant by-laws and enforcement measures, the education and awareness plans, a disaster management plan, communication and marketing plans, as well as the proposed implementation programme of projects and the action plans.

Due to the unique situation facing EMM with regard to risks that occur due to the presence of dolomitic areas, a Dolomite Risk Management System has been adopted by Council, whereby a Dolomite Risk Management Section is to be formed, supported through a variety of structures, i.e. the Dolomite Infrastructure Management Task Team, the Dolomite Awareness Task Team and the Dolomite Emergency Reaction Task Team. These structures will be representative of all departments involved and other service providers like Eskom, Telkom, etc. They will perform a variety of tasks, and will be overseen by a Dolomite Risk Management Steering Committee, consisting of representative officials of all the departments involved.

Identification of Issues Affecting Water Services

One of the key aspects of the WSDP is to identify issues that affect the supply of water services and to propose measures to address these issues. During the drafting of this WSDP, several issues were identified. These are identified below. The details of each are discussed in more detail in the main report.

During the previous WSDP, a comprehensive list of issues were identified and again updated in 2004. These issues identified previously have received attention and have been dealt with to various levels of detail. As most of these issues are addressed through the Master Planning exercise, the specifics will be updated and reported on through that process, which is currently underway. The issues below are additional to those that will be addressed in the Master Plan.

Issues:

1. Information availability and validity: The availability of up-to-date and valid data and information needs to be improved.
2. Services Backlog: The true nature of a services backlog needs clarification, and separated from service needs due to growth and development.
3. Un-serviced CU: A survey is required to determine and confirm the extent of the un-serviced CU in existing areas.
4. Water Quality (WQ) – Various issues regarding WQ projects required, integration of WQ service delivery, WQ monitoring, specific detailed issues (like Jan Smuts dam and Steward pan) and groundwater quality is discussed.
5. Integration: The perception that the provision of water services is purely an engineering function, needs to be changed. Integration of water services delivery by all roll players needs to be improved.
6. AIDS: A formal investigation into the effect of the Aids phenomenon, as related to the potential effect on water demand and water services provision, should be undertaken.
7. Tariffs: A study is required into the effect of the tariff structure on water services delivery, as well to identify best practice in this regard.
8. Affordability: An affordability study to determine the extent of non-payment, the causes thereof, as well as the effect of tariffs on affordability should be undertaken.
9. Water Demand Management Strategy (WDMS): In terms of the new Water Demand Management strategy, incorporated into the new Water Master Plan, the new five year Water Demand Management Program needs to be finalised.
10. IWRMP: The draft Strategic Integrated Water Resource Management Plan needs to be finalised and formalised.

11. Economic Upliftment: Plans and proposals for the economic upliftment of all areas needs to be developed and implemented to ensure that water services delivery remains sustainable.
12. Management and maintenance plan (MMP): The compilation of management and maintenance plan (MMP) for the current telemetry systems within the municipality has to be completed.
13. Indigent Leak Repair: It is essential for the indigent leak repair list, identified in the different regions to reduce water leaks within the households of indigent customers, to be addressed regularly, to prevent build up of backlogs.
14. Housing: The possibility of accelerated housing delivery, of between 137 000 and 230 000 units, should be clarified and discussed. The impact on water services delivery needs to be considered and proposals for integrated delivery finalised.
15. Operational requirements: Implications on operational ability, due to exceptional growth, as well as the cost implications thereof, need to be identified, quantified and defined explicitly and would require approval concurrently with the capital implementation approvals.
16. Economic Viability: Little is done to nourish and grow the economically active customer profile on which the viability of the Ekurhuleni depends. Policy in this regard needs to be reviewed to ensure the sustainability of the Metro.
17. Customer Profile: Deeper insight in required into customer preferences and research is required to add to the general information that is currently available.
18. Rand Water – Storage Capacity: In terms of the new Bulk Service Agreement entered into with RW, the storage capacity is to be determined per connection point and the individual connection point supply to be finalised.
19. Minimum Services Standards for Housing: The official minimum standard for the installation of water reticulation services for new housing should be identified, agreed upon and approved.

1 DRAFTING TEAM AND PROCESS

1.1 DRAFTING TEAM

This WSDP was compiled by:

Water Services Authority:

Ekurhuleni Metropolitan Municipality

Municipal Infrastructure: Water and Wastewater

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1.2 PROCESS

Section 14 to 18 of the Water Services Act 108 of 1997 sets out the process to compile a WSDP. The DWAF recently published the latest guidelines (version 9, July 2005) for drafting a WSDP. After consultation with EMM officials, it was decided to retain the previous format for this report, and to prepare for using the new guidelines in the following WSDP cycle.

In order to ensure integrated action within the departments of the Ekurhuleni Metropolitan Municipality, the Water Services Division initiated a WSDP forum, consisting of representatives of all affected departments, including the IDP Co-ordinator. During the first quarterly Forum meeting, the WSDP rationale was explained, the process of information gathering was discussed and responsibilities allocated. In this way the respective inputs and viewpoints from all sectors were included in the report. It also ensures buy-in from all role-players and establishes the principle that this plan is not just a water sector document, but an integrated process to draft a sectoral plan as part of the full IDP (Also see 1.3 below).

Individual feedback received was studied and where applicable, compared to and integrated with parallel feedback regarding common topics. In some instances, the feedback received had been workshopped internally by the officials involved and joint feedback given.

During the term of the drafting of the report, further meetings of the Forum were held and progress discussed. Where necessary, amended or further input was requested. Throughout the process several other feedback and progress meeting were held at regular intervals.

During February/March 2006, an urgent request was received from DWAF, through the provincial consultants Africon, for an expedited report regarding Sanitation only. Lack of capacity and specific information were cause for much frustration, and while the report was provided to the best ability, it could unfortunately not meet all the demands.

The updating of the water and sewer master plans was underway during the writing of this report. The master planning is scheduled to be completed by mid 2007. The final results could therefore not be incorporated into this WSDP. Where possible, the latest available information (i.e. since previous WSDP) has been included.

It is not the intention of this report to make firm recommendations. However, proposals are made relating to many of the issues put forward here. These proposals may be accepted, modified or rejected by the Metro and/or the stakeholders. But consensus must ultimately to be reached so that the plan can be finalised.

1.3 LINK WITH INTEGRATED DEVELOPMENT PLAN (IDP)

Issues and the recommended initiatives/strategies for improving water services delivery have been summarised in Chapter 10 and will be included in the IDP.

The IDP is a legislative requirement for each Municipality and consequently is in alignment with the sectoral plan of the Water Services Division (i.e. WSDP). The intent of the IDP is to allow the communities and stakeholders to influence the municipality's budgetary requirements in order to address their critical needs and from the municipality's point of view, the sustainability of those needs.

The needs of the communities and stakeholders are collated on an ongoing basis, which feed into the Water Services Division's master plan and are then translated into specific projects. These projects are prioritised and included into the municipality's multi-year budgetary process, taking into account current contractual commitments and funding limitations.

The above processes are being coordinated by the IDP office and the Finance Department (i.e. Budget Office) on an annual basis. The above process is applicable for the Operational and Capital Budget of the Water Services Division. It should, however be indicated that although the Operational and Capital Budget is being done by the Water Services Division in conjunction with the IDP office and the Finance Department, it does not entirely achieve the initial intent of the IDP, to be an Integrated Development Plan. It must be stated that, while the budgetary process has gone far to endeavour to bring the integration component to the plan, it still lacks a process/mechanism where input from other departments are sought.

The above issue must be highlighted under the issue list to be dealt with at a later stage.

Vision and Mission

<p>Ekurhuleni Vision The Smart, Creative and Developmental City</p>
<p>Ekurhuleni Mission Ekurhuleni provides sustainable and people-centred developmental services that are affordable, appropriate and of high quality. We are focussed on social, environmental and economic regeneration of our city and communities, as guided by the principles of Batho Pele and through the commitment of a motivated and dedicated team.</p>
<p>Vision Statement of the Water and Wastewater Department "To be a national leader in providing water services within the Ekurhuleni Metropolitan Municipality area" – Strategic Plan, Water and Wastewater 2001</p>
<p>Mission Statement of the Water and Wastewater Department</p> <ul style="list-style-type: none"> • "To ensure that all sectors, businesses and industries within the Ekurhuleni Metropolitan Municipality area have access to safe water at an affordable and cost effective price" • "To ensure that all wastewater generated within the Ekurhuleni Metropolitan Municipality area is conveyed and treated at an environmentally acceptable standard" • "To ensure service excellence to all contributing parties and sectors" – Strategic Plan, Water and Wastewater 2001

2 SETTING THE SCENE

2.1 PURPOSE OF THE WSDP

With the publication of the new Water Services Act (Act No 108 of 97), all water services authorities are required to prepare a Water Services Development Plan (WSDP), which must be submitted to the Department of Water Affairs and Forestry (DWA). The plan is intended to set out the way in which the water services authority will deliver services to individuals and businesses in its area of jurisdiction. A WSDP must describe the current and future consumer unit profile, the type of services, which are provided, the infrastructure requirements, a water balance, organisational and financial arrangements to be used, an assessment of the viability of the approach, and an overview of environmental issues. Following this analysis, issues need to be identified, which may impact on the provision of effective and sustainable water and wastewater services and strategies formulated to improve service provision. E.g. New or additional infrastructure will not function if the existing infrastructure is allowed to collapse, which feed the new infrastructure. Apart from the above service provision objectives, the WSDP also serves a monitoring tool for DWA and provides important planning information to be included in a national database.

2.2 ACCURACY OF INFORMATION

The data and information included in this report has been consolidated from a number of sources:

- The 2002 WSDP's for Ekurhuleni Metropolitan Municipality;
- Status Quo Report for Ekurhuleni (February 2001);
- Master Plans (March 2002) and some data from Master Plans (2007 being drafted)
- Central Statistics (1996 Census, 2001 Census)
- Discussions with and information provided by officials from various departments

As expected, there are obvious differences in the accuracy and format of available information. Consolidating this data into compatible data required a degree of interpolation and estimation. Therefore, the integrity level of the information contained in this WSDP should be regarded as approximate, which is sufficient when considering that the WSDP is mainly a planning document that effectively needs to identify issues and key performance indicators that could impact on effective water and wastewater service delivery.

Accurate data will be available on completion of the Master Plans 2007. The Master Plan is underway and is due to be finalised in June 2007. The next WSDP document is due to be completed by October 2006, and will therefore also be affected by limited information being available. Due to the annual nature of the WSDP and other strategic plans, steps should be taken to ensure that data and information be kept available and up-to-date.

2.3 DESCRIPTION OF THE AREA SERVED

The Ekurhuleni Metropolitan Municipality (EMM) is located in the Gauteng Province on the East Rand as indicated on Figure 1, and is a relatively new municipality that was formed in 2000 from the joining of the several local municipalities of the former East Rand. It is one of the 6 metropolitan municipalities in the South Africa, and it is known as the industrial hub of the country. The Ekurhuleni Metro was created through the consolidation of 9 former local councils and small portions of Midrand and Bronberg within the former Eastern Gauteng Services Council and Khayalami Metropolitan Municipality administrative areas (see Figure 2).

The Ekurhuleni area has been subdivided into 3 service delivery regions (SDR), i.e. the Northern, Southern and Eastern SDR as indicated on Figure 2. It covers approximately 1923km² and has an average elevation above mean sea level of 1600 m. The EMM is surrounded by the Tshwane Metropolitan Municipality, Johannesburg Metropolitan Municipality, Lesedi, Metsweding District Municipality and Gert Sibande District Municipality. EMM is within the Uppervaal water catchment management area, the Olifants- and Crocodile West water catchment management area and it is part of the Jukskei-, Kliprivier and Blesbokspruit water catchments.

The EMM area covers most of the historical mining area. The geology of the area therefore is typical of the specific nature and formation associated with these activities. Of serious impact is the dolomitic nature of the area, which is relatively active in areas such as Katlehong, Tokoza and the north east areas of Kempton Park (i.e Pomona, Bredell, Hartebeestfontein and Olifantsfontein).

A further impact is the fact that the area is also underlain with shallow mining, such as in the so-called mining belt – Germiston to Boksburg (Main road – historically the old mining road).

2.4 BULK WATER SERVICES PROVIDERS

Rand Water (RW) and the East Rand Water Care Company (ERWAT) are the major bulk water services providers in the area.

RW provides bulk water supply pipelines, pump stations and peak monthly consumption reservoir storage in the area. The storage capacity is to be determined per connection point in terms of the new Bulk Service Agreement entered into with RW. The individual connection point supply is still to be finalised. The consumer units in Ekurhuleni are served through connections to the bulk pipelines/reservoirs, either directly or via the municipal water distribution systems and service reservoirs. RW imposes certain conditions in terms of the 2004 Bulk Service Agreement between Ekurhuleni and Rand Water, which impacts on the water supply, distribution and storage in the municipal systems. These conditions must be taken into account during the planning process.

ERWAT, a section 21 company, now declared by a Board decision to be a municipal entity, is responsible for the provision of regional outfall sewers and wastewater care works in the area. A number of smaller wastewater care works are earmarked to be phased out and replaced with regional water care works as according to the ERWAT's Strategic Facility Development Plan. Such phasing out of smaller works will however only happen in a high-growth scenario, should growth be to such an extent that the income from additional customers would fund the replacement, or should other funds become available for this purpose. Currently the typical unit-construction cost of wastewater treatment plants, are in the order of R3.5m/Ml/day, which makes it prohibitively expensive to replace capacity. The running cost of smaller plants is not so high as to justify the current replacement costs.

Ekurhuleni also purchases water from adjacent Water Services Authorities, including City of Johannesburg for the Alberton and Germiston Service Delivery Centres (SDC's). Effluent is also discharged from the Edenvale SDC (Diepsloot WCW drainage area) to the City of Johannesburg. Planning provision has been made for the elimination of 7 wastewater pumping stations on the western perimeter of the Kempton Park SDC and the Edenvale SDC, which will in future drain to the City of Johannesburg. The EMM Council does however not have the funds to install this outfall sewer. Applications have been made to obtain Municipal Infrastructure Grant funding, but to no avail. Preliminary discussions have been entered into with Johannesburg Water (JW) regarding responsibilities and functions, should this project go ahead. This does however not seem likely in the immediate future.

Figure 1: Locality Plan

Figure 2: Boundaries of the Ekurhuleni Metro and Planning Districts

3 CUSTOMER PROFILE AND SERVICE LEVELS

3.1 CURRENT CUSTOMER PROFILE

3.1.1 Population

In the 2002 WSDP, the population total for the area was estimated at 2.25 million, based on assumptions and calculations as set out below.

According to the Demarcation Board, based on the 1996 census data, the population of the Ekurhuleni area had been estimated at 2 million in 1996. Estimates by the various Service Delivery Centres of Ekurhuleni, indicated that the 2002 population was approximately 3.6 million. Based on the known figure of approximately 500 000 consumer units at the time, and assuming a realistic figure of 4 to 5 persons/CU, it translated to a population figure for 2002 of between 2 and 2.5 mil. According to the 1999 Regional IDP/LDO for the former EGSC, the annual population growth rate had been estimated at between 2% and 2.5%. When applying this growth rate of 2.5% to the 1996 census figure of 2 million, it translated to a population figure of 2.25 million. For the purposes of the 2002 WSDP, a population figure of 2.25 million was therefore assumed.

According to the current Ekurhuleni Strategic Integrated Water Resource Management Plan (SIWRMP), potable water is currently distributed to approximately 505 000 domestic, 6 400 industrial and 1 600 business customers. The backlog of potable water services to potential customers/users that do not have access to water, is estimated at 137 000 CUs. This backlog is mostly situated within and around the previously disadvantaged township areas and in the informal settlements in the mining belt.

Applying the same assumption as in the previous WSDP, i.e that there are realistically between 4 to 5 persons/CU, to an estimated total CUs of approximately 642 000 (as above), the total population for the area is estimated between 2.55 million and 3.2 million.

There are a number of factors that may impact on the future growth rate of which the most important are the effect of HIV/Aids, influx from other areas and provinces, the creation of housing opportunities through Dept. of Housing initiatives and economic growth in the region.

During the final stages of the drafting of this WSDP report, information became available of the planned potential provision of major housing projects, which could lead to an addition 130 000 to 230 000 housing opportunities in the medium term (4 to 5 years). While a large part of this would provide for Ekurhuleni's internal housing backlog (i.e. consumers currently within the service boundaries). Such a scheme would lead to an unnaturally large population increase. The reality of this plan and the potential impact on water services in Ekurhuleni needs to be investigated fully and reported on in the next WSDP in this regard.

3.1.2 Income distribution

Key to the affordability of any investment programme is the income profile of the consumer units (CU) it is to serve. If services are provided to CU who cannot afford (or are not willing) to pay for them, then a problem of non-payment is likely to arise and the financial viability of the service provider will be placed in jeopardy.

During the drafting of the 2002 WSDP, the weighted average income distribution (calculated from the individual SDC's 1996 census information), as well as the income distribution as estimated by the Demarcation Board, were analysed. From the estimates it was seen that

between 36% and 44% of all CU (households) earn less than R1000/month, which implies that they are unlikely to afford high level of services.

3.1.3 Current Number of Consumer Units

Previous estimates of the number of consumer units (CU) in the areas that make up the Ekurhuleni Metropolitan Municipality varied to a large extent. EMM undertook a meter and customer audit to obtain accurate figures in this regard.

The estimates have now been verified through the meter and customer audit initiative, to be slightly less than anticipated previously. The current domestic consumer units (CUs) are 480 000, with 6 400 industrial CU and 1600 commercial/business CU. Through this meter and customer audit exercise a number of consumers were identified to be small businesses operating from residential stands, which consequently have not previously been taxed appropriately. The project therefore was successful i.t.o. revenue enhancement.

3.2 FUTURE CUSTOMER PROFILE

Household (or residential consumer unit) growth needs to be projected for planning purposes. A deterministic approach has been adopted for the Ekurhuleni area.

Areas earmarked for potential future development have been identified in the various master plans. This information was updated by information received from the relevant town planning departments. These future development areas have been categorised according to residential, industrial and business/commercial.

In the previous WSDP, it was reported that the number of formal CU will increase from 373 700 (excluding backyard and informal CU) to 427 000 when the present developments are fully occupied and will further increase to 752 600 when all the future areas have developed (total additional area = 27 619 ha). The realisation of these developments depends on various social, political and economic factors. When assuming a population growth rate of between 2 and 2.5%, it implies that the implementation period for all the future developments identified is 25 –30 years.

Large areas have been earmarked for development, especially in the areas:

- in-between Vosloorus and Boksburg (Mapleton – Villa Liza/Roodekraal),
- North of Daveyton and Etwatwa (Knoppiesfontein),
- Surrounding the JI Airport,
- North of Tembisa,
- South of Alberton in the Palm Ridge / Eden Park area
- Areas east of Tsakane and Langaville.

During the final stages of the drafting of this WSDP document, it has become known that an external initiative is being planned for the provision of up to 230 000 housing opportunities in the Ekurhuleni area. If this becomes reality, considering the figures as quoted above, the projected development period of 25 to 30 years will be reduced drastically, and expenditure on infrastructure would need to be expedited to the extreme. Little is currently known of this initiative and the proposal would need to be considered fully in the following WSDP. The possibility, requirements and effects of such a proposal will be considered in the Master Plans which are in process of being drafted.

As discussed further in latter parts of this report (Chapter 9), municipalities need to adopt an Integrated Water Resource Management approach, which amongst other elements, stresses the municipality's role in ensuring the economic viability of the local area. In order to ensure a viable Metropolitan Municipality, economic upliftment of the areas is essential. Little is done to nourish and grow the economically active customer profile on which the viability of

the Ekurhuleni depends. Policy in this regard needs to be reviewed to ensure the sustainability of the Metro.

Regarding the “customer” in Ekurhuleni, some general data exists relating to a customer profile. Additional research is to be conducted that will provide a deeper insight into customer preferences. Existing material should be married with what has already been done by the Research & Development Department. Either the Communication & Marketing department should co-ordinate such a study, adding to the development of a Customer Satisfaction Index for Ekurhuleni. While such a study would encompass much more than just water services, the results would be of great value in determining the future of water services in the Metro.

3.3 CURRENT SERVICE LEVELS

Service levels in the existing formal developed areas (excluding rural areas) generally meet the minimum standards as required by the Water Services Act 108 (of 1997), i.e. communal standpipe within 200 m walking distance and ventilated improved pit latrine (VIP) or equivalent.

The previous WSDP pointed out that some areas existed that did not meet these standards. Existing service levels are shown in Figure 3 & Figure 4.

The reasons for the non-delivery of formal services were due to a variety of reasons. Mostly, services were not provided to informal areas which were of temporary nature, or illegally occupied which could not be formalised. This situation still exists, although the specific areas have changed.

The policy for formalized service provision (permanent services) remains that services are provided through the housing programme to formally developed housing areas. Through the application of this policy, services are provided to an ever increasing number of people. Even though the backlog in services delivery of the previous years has been eliminated, the size of the “backlog” of services remains fairly constant. This is due to the fact that, as informal settlers are accommodated through the housing programme, more people migrate to the area in search of opportunities and housing.

Temporary services are continued to be provided to these transit areas.

Definitions of the service level categories as implied by the Water Services Act are provided in Table 1.

Table 1: Service Level Categories

Category	Water
Inadequate	No access to basic water supply (as defined below)
Basic	a) the provision of appropriate education in respect of effective water use; and b) a minimum quantity of potable water of 25 litres per person per day: <ul style="list-style-type: none"> ▪ at a minimum flow rate of not less than 10 litres per minute; ▪ within 200 metres of a household; and ▪ with an effectiveness of not more than 7 days interruption supply to any consumer per year. This service is usually provided through communal taps (standpipes)
Intermediate	Yard Tap, Yard Tank
Full	House connection
	Wastewater
Inadequate	No access to basic sanitation as defined below.
Basic	a) the provision of appropriate health and hygiene education; and b) a toilet which is safe, reliable, environmentally sound, easy to keep clean, provides privacy and protection against the weather, well ventilated, keeps smells to a minimum and prevents the entry and exit of flies and other disease- carrying pests. This service includes VIP's, Formal black bucket, Container and Chemical Toilets usually provided as a communal service.
Intermediate	Communal Toilet (Ablution Facilities)
Full	On-site Waterborne, Septic Tank or French Drain

3.3.1 Service Level Estimate based on previous WSDP's / Master Plans

The figures below are as previously reported in the WSDP of March 2002. These figures are currently being updated in the Master Plan which is underway, the results of which will be available shortly. These figures below are therefore not up-to-date, but still serve as indicative of the order of magnitude of current service levels.

“Water Services:

Approximately 15700 (3.2%) residential CU have none or inadequate water services, while 31700 are served with communal standpipes, 62000 by yard taps (on-site) and the rest (317 000) are provided with in-house water connections. There are also more than 18 000 backyard shacks which probably meet the minimum service level requirements, however for purposes of financial modelling, the assumption that 50% of the backyard shacks will require services of their own in the short term needs to be made.

Wastewater Services:

Approximately 137 000 residential CU have none or inadequate wastewater services, 13 600 are provided with basic wastewater services (VIP or equivalent), 3 400 intermediate wastewater services (septic tank), while the majority (480 000) are provided with waterborne sewer connections.

Most non-residential CU's are provided with metered on-site water and waterborne wastewater. “

Source: Ekurhuleni Metropolitan Municipality WSDP (March 2002)

Figure 3: Existing Service Levels: Water

Figure 4: Existing Service Levels: Wastewater

3.4 FUTURE SERVICE LEVEL STRATEGY

The area of jurisdiction of the Ekurhuleni Metro can be categorised as follows, according to access to services:

- Urban periphery:
Characterised by scattered communities on private agricultural holdings or farm portions that have none or limited access to bulk water services. These areas generally make use of on-site water services usually provided through own incentives.
- Urban Areas:
Characterised by the availability of bulk water and wastewater services as provided by the Water Services Authority

Section 3 of the Water Services Act 108 of 1997 states that, "Everyone has a right of access to basic water supply and basic sanitation". However, this duty of the Water Services Authority is subject to certain limitations as set out in the Act, including "the availability of resources" as indicated in section 11.2. Therefore, when formulating a service delivery strategy, a distinction is necessary between the urban area and urban periphery, based on the availability of bulk services. Cognisance should also be taken of the environmental and financial constraints as well as the land ownership. The Constitution of the Republic of South Africa in fact determines that service delivery by local government should be done in where it can be done in a sustainable fashion.

In November 2001, The Gauteng Provincial Government adopted a strategy ("Business Plan for the Elimination of the Backlog in Water and Sanitation Services in the Gauteng Province) to provide an intermediate service level to all formalised settlements and informal settlements that can be upgraded in situ.

The implementation plan to upgrade the backlog of households, as proposed through this strategy, set targets for provision of services to those areas where a backlog existed as well as identifying those areas where services could not be provided and relocate to serviced areas.

One of the biggest, if not the biggest, influence on future water and sanitation services provision, is the effect of this demand that exists for services, which is incidental to the housing demand in the area. According to the Ekurhuleni Housing Department, housing provision demand is estimated at 137 000 housing units, although external sources make mention of programs that are planned to house up to 230 000 families. Currently, the Housing department has identified projects for the provision of housing to 137 000 beneficiaries over the next three years, i.e. until the 2008/09 financial year.

The practical implications of housing provision on such a scale is enormous and already this aim seems to be unrealistic. Current expectation is that the implementation of the projects, as planned, will be delayed by at least up to a year, i.e. implementation by 2009/10. Even at this tempo, the impact on service delivery will be great. The financial aspect of this housing program is discussed later in the document.

The provision of reticulation services for new housing is undertaken by the Housing Department. A current risk is that there is no official minimum standard for water services according to which this service provision is implemented. With good cooperation between the relevant departments, this does not cause immediate problems, yet an agreement to formalise minimum standard for future services should be put in place as a matter of course.

The strategy for provision of future services is as follows:

Urban areas

- a. The status quo of current CU with yard taps will be retained.
- b. All new CU will be provided with metered on-site water and waterborne wastewater of sufficient quality and quantity as required by the Act.
- c. Where current CU have none or inadequate services, these will be relocated to formal housing projects according to the Housing Department's Migration Plan. Where this is not possible, or in the interim, while awaiting relocation, temporary or emergency services will be provided. Eco-dry systems are used as a minimum standard at temporary settlements. Where it is possible, planned and approved according to the Housing Strategy, in-situ upgrade to permanent services will be considered and undertaken, dependant on the priority and availability of funding.
- d. The elimination of the services backlog in the short term, as envisaged by the Gauteng Province, poses a huge challenge on existing resources. As mentioned in the previous section, the "backlog" is continuously replenished through the effects of growth and migration to the Metro, and it seems doubtful whether it can ever realistically be eliminated. It may in fact be questioned whether the presence of a certain magnitude of a lack of services indeed represents a true backlog.
- e. It should be considered that a "backlog base" of certain magnitude should be recognised and acknowledged. The policy should be to ensure that those potential beneficiaries, who make up this base number at any time, should be relocated or be provided with services in terms of the Housing Strategy. This Strategy should be integrated with an Economic Development Strategy which ensures that housing provision takes place with a concurrent provision of job opportunities and social development.
- f. Lower service levels should not be considered under normal circumstances. Only if reasonable proposals still cannot provide a sustainable financial situation, should the lowering of service level be investigated for new CU. This should only be considered as a temporary measure and in cooperation with the Province, while an acceptable permanent solution is being found.

The urban periphery

- g. No formal services would be provided on private land. The policy is to provide basic water supply and a basic wastewater service, as defined according to the Act, to all CU on Council owned land taking cognisance of the physical, social, technical and financial constraints as set out in the Act. Water supply to these areas could consist of borehole schemes, where feasible, or could be provided through tanker services (not preferred due to high operational costs). On-site sanitation in the form of Ventilated Improved Pit latrines can be provided as a basic service. Cognisance should, however, be taken where dolomitic activity is high (e.g. Bapsfontein, etc.).

In terms of the Housing Strategy, the Housing Department has drafted a Migration Plan, which identifies future potential housing delivery sites, the potential capacity for each area and a possible origin/destination matrix for migration. On identification of potential sites, a feasibility study is undertaken, which includes a dolomite risk assessment. Where dolomite presence and degree of risk is of significant magnitude (category C3), areas are not developed.

In general, the presence of Dolomitic areas also affects water services. Due to the fact that approximately 30% of the Ekurhuleni geographical area is dolomitic by nature, which is prone to the formation of sink holes, both the provision and operation of water services are affected.

As mentioned above, with the housing projects, it is necessary to investigate the presence, degree and risk probability regarding dolomite, of any area which is to be newly developed. Where necessary, development is not allowed to take place. In areas of lesser risk, adequate measures are implemented to minimise the risk. Where dolomitic activity does take place in older areas, it has an affect on existing services where damaged services need to be repaired or replaced.

The EMM has adopted a Dolomite Risk Management system and policy which involves all affected parties and departments. As part of this policy and risk minimisation measures, projects which affects water services are e.g. the elimination of old mid-block services which was provided between houses or units in housing schemes. These services are in some case impossible to maintain, due to the inaccessibility thereof, and can become a growing risk in dolomitic areas.

4 WATER BALANCE

4.1 WATER RESOURCES

Rand Water (RW) and Johannesburg Water (JW) are the two bulk providers of potable water services in the Ekurhuleni area. There are 133 active connections from the RW system. There are also 23 previous connections which are no longer active. The inactive connections have become redundant due to system changes or from having been replaced. There are 3 JW active connections in the EMM. Of the 133 RW connections, 26 supply Consumer Units directly, but receive accounts from the relevant SDCs.

Groundwater and surface water abstraction for potable use, mainly occurs in the urban peripheral and rural areas (i.e. Bapsfontein area, agricultural areas) that do not have access to bulk water services as provided by the Water Services Authority. These CU generally reside on private land.

4.2 WATER DEMAND

The total water demand for EMM for the previous three years is shown below, in terms of total bulk water purchased, water sold and average % losses for the year.

Table 2: Water Demand Figures from 2003 to 2006

Financial year	2003-04	2004-05	2005-06*
Water purchased – Annual Total (MI x 10 ³)	274,54	282,97	289,42
Water sold – Annual Total (MI x 10 ³)	211,87	228,46	234,43
Annual UAW (MI x 10 ³)	62,67	54,51	54,99
Annual UAW (%)	23%	19%	18%
Water purchased – Daily average (MI/day)	752,12	775,26	792,9

*Includes projected purchases for the last three months of the financial year

In November 2005, the Ekurhuleni Council adopted a Water Demand Management Strategy (WDMS) that was implemented by the Municipal Infrastructure Department: Water Services to conserve the water resources, to use water more effectively and to implement measures to promote water conservation and demand management, in terms of its obligations from the Water Services Act 108 (1997) and National Water Supply Regulations, as well as feedback of the Customer Audit Project undertaken. This strategy is a result of a Water Demand Management Programme undertaken according to the previous Water Services Development Plan (WSDP).

Within the strategy, a practical approach was utilised with 3 key focus areas:

- The updating of stand and consumer database
- Infrastructure improvements and metering
- Efficient use of water by consumers and control of demand

A number of ad hoc strategies have been identified and implemented to reduce non-revenue water, to increase income and to ensure a more efficient water supply to the consumer, to assist in achieving the goal of a 0% growth in water demand for the Ekurhuleni Metropolitan Municipality over the next 5 years, i.e. the objectives of the Gauteng Water Cycle Demand Management Forum.

During implementation of the various strategies since March 2002, a number of successes were achieved and valuable lessons were learnt. The WDMS contains a comprehensive report of the current programme, also mentioning the various activities that have been undertaken over the past few years.

The new Water Demand Management Strategy (WDMS) forms part of this Water Services Development Plan, to ensure the sustainability of the programme.

4.3 WATER DEMAND PROJECTION

The 2002 WSDP showed that future water demand (at the time) would increase to 725 MI/d when the developments then underway were fully occupied and to 1 124 MI/d when all the future areas identified have been developed. These estimates were based on the 2002 Master Plan. Current total water demand, i.e. bulk water purchased in the 2005/06 financial year equals 793 MI/day, which includes water losses of 18%. Actual water sales equates to a demand of 642MI/day. The growth in bulk water purchases from 2004/05 to 2005/06 was 2.2%, with the expected (budgeted) growth in purchases to the 2006/07 year being 3.4% per annum.

From these figures, it can therefore be seen that the demand as predicted three years ago has been reached (and surpassed) and that demand is growing towards the predicted 1 124 MI/day as predicted for full future development. The Master Plan is currently being updated (expected June 2007) when the estimation of future demand will be updated.

The average increase in total water purchases for EMM was 2.6% per annum for the period July 2004 until present, according to the treasury data, with the predicted growth for the next financial year being 3.4%. When assuming that this growth rate is maintained, it implies that the full future water demand of 1 124 MI/d will be realised in approximately 20 years time. There are however many factors which may influence the growth in water demand of which only the most significant are herewith discussed:

- The impact of HIV AIDS needs to be considered, since this may result in a negative population growth rate as is allegedly experienced in the Kwazulu Natal area. Testing for AIDS is still not being done to an extent as to provide adequate information regarding possible future impact as related to water demand. Testing happens in a variety of locations, many private, and the information is neither readily accessible nor identifiable with a specific region. Efforts are made by the Health departments to get all institutions that do HIV testing to collate that data for representivity and for proper planning purposes. In terms of the data from EMM clinics, the number of people who are testing positive for HIV is increasing. Consideration should be given to the undertaking of a formal investigation into this phenomenon, as related to the potential effect on water demand.
- Water conservation and demand management strategies are required according to the National Water Supply Regulations and the Water Services Act 108 (1997). The Gauteng Water Cycle Demand Management Forum set a target for 0% growth in water demand for the immediate future, the realisation of this objective being crucial in postponing the next phase of the Lesotho Highlands Project. Contained within the EMM Water Demand Management Strategy, there are various proposed mechanisms aiming to minimise water consumption, i.e. attempting to achieve these goals. Apart from the actions to minimise losses, there are mechanisms like the Public Awareness Campaign that will have the objective of growing a culture of water conservation as a normal way of life. Various water saving mechanisms will also be advocated through this awareness campaign.

- The introduction of the National objective to provide the first 6 kl/month free of charge to all CU has required the restructuring of tariffs to cross-subsidise the loss of revenue by LA's. (NOTE: EMM has recently resolved to, from the next financial year, raise this to 9kl/month for registered indigent consumers). The implementation of these block tariffs has affected water consumption. It was expected that this may cause a decline in the water consumption for the higher tariff blocks (15-30, 30-60, >60 kl/month), since these CU would use water more sparingly due to the higher cost thereof. However, the opposite was also perceived to be possible for CU in the lower tariff blocks (0-6, 6-15kl/month), i.e. the majority, who may not perceive water as a scarce commodity, due to being provided for free, thus causing increased water consumption.
- The growth in water purchases for the year 2004/05 was 3.0% and 2005/06 equal to 2.2%, an average of 2.6%, which was lower than the growth rate for the period 1990 to 2000 on average. The expected growth rate for 2006/07 is 3.4%, which is higher again. Bearing in mind that these figures also accommodate the growth in CU for the area, it would seem that the real rate of demand increase is in decline. It is however impossible to conclude what impact the introduction of the block tariffs had on this perceived decline in growth.
- It may be of significance to determine to which extent, water tariffs affects water demand or consumption. This may be done by doing a historical analysis of a representative sample, representing users in each of the tariff categories, for an extended period of time.
- Water restrictions, when applied, have a significant impact on water consumption as illustrated by the steep decline in consumption experienced during 1996 after restrictions were imposed.
- The introduction of very strict credit control measures can cause a decline in the water consumption. The Water Demand Management Strategy includes measures that will affect credit control, which include improved information systems and data.
- Various water loss improvement programs for part of the WDMS, which will decrease water demand. These are discussed further in 4.7 below.
- As mentioned in Section 3.2 above, the possibility of a 230 000 unit housing project is considered and, should this realise, the short term increase in water demand will be enormous. This will be dealt with in the current Master Plan and should be discussed in detail in the next WSDP report.

4.4 WATER QUALITY

The water quality of the potable water is monitored by EMM and Rand Water. The Regions also have their independent monitoring programmes in the water services networks, like reservoirs, streams, wetlands and dams. The responsibility for water quality is not solely that of the Municipal Infrastructure Department (Water Services Division), but should be shared by other departments.

The IPC (Health and Social Development) currently plays a role in water quality management, by:

- Identifying possible sources of water pollution through inspections and audits,
- Complaints and referrals,
- Evaluating the extent of problems in terms of health risks,
- Exercising control through notices, Public Health by-laws and referrals to relevant departments,

- Collaborating with other stakeholders and adjacent Municipalities about cross-boundary water pollution related matters,
- Moore pads sampling for cholera,
- Sampling of dams used for Recreational purposes such as swimming and boat racing.

The type of incidences that the IPC deals with, include:

- Visible Pollution incidences from industries during routine inspections,
- Complaints on blocked sewerage systems and from industries,
- Smell investigation from polluted water.

Some of the challenges affecting water quality management are:

- Budget constraints,
- Identification of other pollution sources, e.g. backyard industrial activities that affects stream and rivers.
- Implementation and coordination of comprehensive surface water and borehole water quality programs through departmental committees.
- Implementation of a programme that will involve all stakeholders for rehabilitation of some streams and rivers within Ekurhuleni Metropolitan Municipality.

Some projects that are proposed for inclusion into a Water Quality Strategy are:

- Assessment of ecological state of major rivers and streams,
- Borehole census and ground water assessment,
- Investigation of certain chemical spillages that may require further assessment in terms of their penetration abilities and effect on the environment,
- Investigation of infiltrate into and ex-filtrate of sewage in sewer conveyance lines.

1. Potable water

The quality of the potable water is monitored by Rand Water (Bulk Services Provider) and a monthly report is received from Rand Water. The Metro distributes potable water through its network to its customers in the EMM boundaries. It therefore has to make sure that during this distribution process the quality of water remains within the SABS 241 - Class I standard and that no contamination takes place and thus monitors it accordingly as well.

In the Eastern Region of the Ekurhuleni Metropolitan Municipality, reported incidence of potable water discoloration occurred. During February 2006, a yellow discoloration was experienced in the drinking water originating from the raw water source purchased from DWAF by Rand Water. It transpired that, resulting from the rapid filling of the Vaal Dam from 46% to 100%, large areas of exposed land and vegetation were submerged. The discoloration of the raw water supplied to Rand Water resulted from the drowned vegetation. The discoloration had no effect on the water quality from a health point of view.

It has been noticed during the past that, during summer months, the chlorine levels in the water at some of the EMM sampling points dropped considerably and that the HPC also increased simultaneously. This issue needs further investigation and resolution.

Another issue of potable water quality is that of the effect of Geosmin. Geosmin is a natural by-product of the blue-green algae found in the surface water of water sources. Blue-green algae thrive in the ideal conditions experienced during the mid-summer season, when bright sunlight and warm temperatures prevail. When low dam levels were experienced in the Vaal Dam, the situation was aggravated.

The Geosmin in itself is not harmful or hold a health risk, but cause a pungent smell within the water. The smell can be very persistent and cannot be effectively removed from the water through conventional water purification processes. Rand Water gives notice in his regard when it is expected that Geosmin has been detected in the potable water supply.

An issue that has caused an outcry amongst residents recently was the perceived presence of 'rat-tailed' maggots in potable water. It is categorically stated that it is impossible for these maggots to be found in potable pressurised water supply. They are sometimes to be found in standing contaminated water and wet areas. Due to the nature of potable water distribution and sewer infrastructure within the Metro, the appearance of 'rat-tailed' maggots is not due to the EMM distribution systems and processes, but the failure of some residents/owners failing to maintain wet areas on their own properties.

Informal Settlements:

Due to and urgent need of providing accessible drinking water to all residents of Ekurhuleni, and as part of its policy, temporary drinking water storage containers are placed in rural areas to supply water to these communities. Water is transported to these areas via transport water tanker and stored in 10 000L polyethylene containers. In an internal study, the quality of water in these containers was compared to that of direct supply from reservoirs. Results indicated that the quality in the containers were poor, as a result of low level of chlorine in the water. The decrease in the chlorine levels occur during the transit of the water. To remedy the situation, a chlorine float was utilised in the tanker when the water was in transit, to sustain chlorine levels. Results from a one month trial were positive, where bacterial counts decreased drastically and chlorine levels increased, thus improving the quality of water supplied to the informal areas.

The Ekurhuleni Metro has recognized the imperative that the provision of water of the highest quality to these residents be maintained, and that health is not compromised. The practice will therefore be continued to make use of chlorine floats when the water is in transit.

2. Industrial effluent

Industrial effluent control is the responsibility of the Metro for policing of acceptable discharge limits and recovering of purification costs from industries. The Metro, through its by-laws, requires that industries take cognisance of their responsibilities towards a cleaner environment and reduce toxic waste generation in their processes. The allowable industrial effluent discharge limits are directly related to the permit/licence standard given to the wastewater care works by DWAF. These industrial effluent limits are also dictated by new scientific information on toxins, new standards and legislation set by government not only on water, but also much more, e.g. the environment.

There is some pollution that results from effluent from industrial areas. One example is at Steward Pan, located to the south-west of Benoni town centre, where inflow emanates from industrial areas to the south. Although the water quality improved since 2004, after a report in 1984, major problems are still experienced with high zinc concentrations entering the pan. Other factors present are sewerage pollution sometimes occurring from blockages and failure of the Dunswart pump station. Another source of pollution found, was illegal connections of grease traps to the stormwater system.

Another example is at Jan Smuts dam, a shallow natural pan close to the Brakpan CBD. The pan has no natural outlet. The primary purpose of this water body is to act as a receiving pond for stormwater from the surrounding areas and as an outlet for discharge from the Jan Smuts Water Care Works. Treated effluent from these works has been released into the pan since 1938.

There are several issues contributing to operational problems at the dam. These range from polluted inflow to the absence of natural stormwater and no outlet, susceptibility to eutrophication, excessive enrichment with algal growth nutrients and a cessation of maintenance due to changes in the institutional framework that has remained unresolved.

A detailed report on this issue is available on the Water Research Commission website www.wrc.org.za.

The report makes detailed recommendations, ranging from obtaining analysis results from the master plan to making proper institutional arrangements for the management of the site. These measures need to be implemented as a matter of urgency, together with remedial steps to address the issues at the Steward Pan.

3. Wastewater discharge

ERWAT has been assigned, by way of a long term agreement, to treat wastewater for the Metro. They therefore have to take full responsibility for the monitoring and compliance of the discharge requirements towards DWAF and the EMM. The quality of the final effluent, discharged from the wastewater care works into the rivers, is monitored by ERWAT and the Metro monitors the rivers down stream of the water care works regularly. ERWAT is still operating their wastewater care works under the old permits. The guidelines for in-stream water quality, compiled by the river forums, are used by DWAF to determine the new license conditions for the discharge of the final effluent into the river systems. It would require the significant upgrading of the wastewater care works if these licence conditions are not being met. This could require a considerable capital investment.

DWAF is currently busy establishing a discharge charge system that should be implemented during 2007. The required quality of the water discharged into the river system will have an effect on the additional charge to be paid. Provision should be made for the payment of the discharge charge by ERWAT.

4. Surface water, rivers, "spruite" and stormwater drains

The quality of any other water, generally flowing from within the metro boundary, such as rain water, underground water or streams and rivers passing through the Metro, has to be monitored. This should be both for monitoring of pollution and/or contamination and for quality recording and the maintaining of a quality database. In many cases it is possible for the pollution to be traced back to the source by the department doing the monitoring. Where possible, appropriate action should be taken.

Water quality is often negatively affected by external factors, such as illegal solid waste disposal, unforeseen blocked sewerage systems, systems with insufficient capacity (sometimes temporarily) or contaminated surface debris that cause severe water pollution. Examples of capacity problems occurred during the abnormally heavy rains between December 2005 and February 2006.

With flow into the Herbert Bickley and Jan Smuts WCW's being restricted, raw sewerage escaped from manholes in residential areas. The problem may have been exacerbated due to stormwater ingress into the sewerage system. In Nigel, the inability of the stormwater system to accommodate high volumes of stormwater out of the Vorsterskroon industrial area, led to flooding of the area. From a water quality point of view, the stormwater became polluted with effluent of a very acidic nature with a high metal content. Also, pollution occurred from contamination from underground oil sumps.

Issues like the above demonstrate the need for all departments to be involved in pollution prevention at all levels.

4.5 EFFLUENT RETURNED TO SOURCE

The East Rand Water Care Company (ERWAT) provides the main outfall sewers and operates most of the water care works in the area. According to figures provided by ERWAT, the average dry weather flow (ADWF) from the WCW's is 478MI/d and the wet weather flow (WWF) is 550MI/d.

Generally approximately 60% to 70% of water sold to CU, i.e. is returned to the water cycle in areas with waterborne wastewater systems. As indicated in 4.2 above, the total volume of water sold to CU is 642 MI/day. Based on these assumptions, the volume of effluent returned to the water cycle, is estimated at between 385 MI/d and 449 MI/d. The rest of the effluent flow treated at the WCW is contributed by stormwater ingress (infiltration and influx), in this case estimated to vary between 29 MI/d and 93 MI/day. This shows a marked improvement from the previous WSDP, where infiltration was estimated at 185 MI/day. This improvement can be ascribed to improvements in the provision for waterborne wastewater of the previous few years. The continuation of this good practice ensures the limitation of funding required for the capital improvements and extensions to treatment facilities.

4.6 UNACCOUNTED-FOR-WATER (UAW) ANALYSIS

The UAW varies geographically and is mainly dependant on the:

- pressure in the distribution system,
- density of connections and length of pipelines,
- age of the distribution system,
- management and operation of the system,
- land use,
- number of illegal connections.

According to the latest treasury figures, the UAW is approximately 18% for the Ekurhuleni area, for the 2005/06 financial year. At the current bulk water unit cost, this implies a total loss of revenue of R 174.4 million per annum (bulk water unit cost of R3.17/kl - 2005/2006 tariff).

Water losses for 2003/04 approximated 23%, while for 2004/05 it was 19% and for 2005/06 18%. The 2006/07 budgets make financial provision for 20%, but it is planned that the reduction in water loss rates should keep improving to below 18%.

In order to target areas with high UAW for water demand management, a detailed UAW analysis is required per suburb or bulk meter zone. This can only be performed if the bulk water meter records are compared with the water sales in each zone. Such detailed investigations have previously been performed for the Alberton, Boksburg, Germiston, Benoni and Edenvale Service Delivery Regions.

In order to reduce the UAW, submission was made to the Finance Department during the current 2006/07 budget cycle for increased maintenance funds, especially on preventative maintenance and repairs, which was higher than the allowable percentage budget increase. Funding has been forthcoming from the Finance Department for this cause.

4.7 WATER DEMAND MANAGEMENT PROGRAMME

As previously mentioned (section 4.2 above), the Municipal Infrastructure Department (Water Services Division) has undertaken a Water Demand Management Programme according to section 4.7 of the Water Services Development Plan (WSDP) in March 2002.

The practical approach to the water demand management programme identified 3 key focus areas:

- Updating of stand and consumer database
- Infrastructure improvements and metering
- Efficient use of water by consumers and control of demand

The main elements, successes and lessons learnt from the Water Demand Management Strategy (2002) is discussed below, followed by the recommended approach for a new WDMS.

SECTION A: CURRENT EMM APPROACH TO WATER LOSS MANAGEMENT

After the restructuring of the Ekurhuleni Metropolitan Municipality and the amalgamation of the nine different local authorities within its boundaries, the municipality was faced with various challenges, none more so than the high unaccounted for water of 32% in the Ekurhuleni Metropolitan Municipality.

At a meeting on 9 October 2002 it was agreed that the first priority should be to conduct a full-scale customer audit of all the stands in Ekurhuleni, to correct the stand database, update the stand database and to correct the billing information, from that point to develop strategies to reduce unaccounted for water. It is against this backdrop that the Municipal Infrastructure Branch has introduced various ad hoc activities to maximise revenue while minimizing water losses.

Various consultants were commissioned to investigate existing operational functions and to compile management and maintenance plans for a telemetry system, a cathodic protection system and a pressure management programme. These interventions form an integral part in planning, budgeting and implementing a future Demand Management Strategy for Ekurhuleni Metropolitan Municipality.

4.8 GENERAL WATER MANAGEMENT STRATEGIES

Customer Audit project

A full scale meter audit was undertaken early in 2003 to reduce the high commercial losses due to meter related problems and incorrect billing information aiming to increase revenue and enhance the accuracy of data. A number of sources of additional revenue have been identified during this process, which could be categorised in two categories, i.e. meter related revenue & data validation revenue.

Although projected figures, demonstrating the potential increase in revenue, seems impressive, it must be noted that these savings have not materialised and that the process have not been completed. Various factors still impact on the success of the audit, such as:

- new meter data received needs to be verified with the Venus information by Finance before the Water and Electricity Meter Management (WEMM) system can be populated,
- new stand data needs to be verified with Venus information,
- GIS data needs updating and maintenance for serving and supporting the various projects in Ekurhuleni Metropolitan Municipality,
- Faulty meters need to be replaced, especially those identified as requiring urgent attention.

Information management systems

The consolidation of the erstwhile nine service areas required strategic management decisions to be made, to address the effect of incomplete and unreliable information regarding operational matters, billing records and unreliable information regarding asset control.

This showed the need for a functional management system with the following capabilities:

- Water and Electricity Meter Management (WEMM)
 - The WEMM system is used to manage all water and electricity meters on reading of meters, validation of readings and all connection-related information.
- Task Request System (TRS)
 - The task request system is used to log and track all water service-related faults and public complaints, allow management to follow up the progress of the resulting jobs.
- Maintenance Management System (MMS)
 - The maintenance management system is used to manage all maintenance performed, generate work instructions, dispatch work instructions to a service provider and capture completed job card information. This enables productivity assessment at all levels.
- Asset register
 - A basic asset register can be accessed by WEMM, MMS and TRS. All types of assets are registered in the system, which will enable proper asset management.
 - Currently, all these modules have been implemented in the Northern Region, with phased implementation to all other regions planned by the end of April 2006. The modules as implemented in the Northern Region are not all fully functional yet, but are being tested operationally.
- Telemetry system
 - Accurate monitoring of water services infrastructure is critical for proper planning and budgeting for operations and maintenance. The Ekurhuleni Metropolitan Municipality has appointed Motla Engineering (Pty) Ltd to compile a management and maintenance plan (MMP) for the current telemetry systems within the municipality.
 - Telemetry systems are systems which monitor conditions and alarms of remote infrastructure, e.g. reservoirs and pumps, from a central master station through a communication medium e.g. radio. This enables the operating staff to react immediately to an emergency situation in the field. It also reduces manpower requirements for repetitive standard monitoring activities.
 - The result of this MMP was a master plan with a phased implementation of the repair and upgrade of the telemetry supervisory system over a 5-year period.

4.9 WATER LOSS STRATEGIES

Pressure Management Study

A pressure management study in early 2002 involved investigations into the potential for pressure management in all management zones in Ekurhuleni Metropolitan Municipality. All relevant data was collected in connection with the existing pressure zones in the study area.

The resultant report has provided valuable information for future implementation of an effective water loss management strategy. It pointed to some deficiencies in the management of the system and indicated the scale of potential savings, expenditure and the cost benefit ratios of implementing an effective Water Loss Management Strategy for the Ekurhuleni Metropolitan Municipality.

Recommendations included:

- Installation of control meters on Rand Water and Johannesburg Water connections;
- Implementation of a maintenance program for control valves;
- Implementation of a pressure management strategy;
- Continuous flow and pressure monitoring;
- Implementation of a passive leakage control program; avoiding expensive leak detection exercises;
- Meter replacement programmes for large industrial consumers;
- Priority retrofitting of meters to indigent consumers.

4.10 WATER DEMAND MANAGEMENT STRATEGIES

Customer Awareness Campaign

After consultation between the Water Services Division and the Marketing and Communications Department regarding the best approach to a marketing and customer awareness campaign, it was decided to solicit the services of an advertising agency to produce a business plan (blue print) and develop a creative campaign in an appropriate media.

Due to an estimated cost of approximately R6 million per annum, over a period of at least three years, the funds were not approved on the 2005/06 operational budget and thus no progress in this regard has been made.

The potential benefits of a customer awareness campaign include protection of infrastructure against vandalism and theft, introduction and acceptance of water saving mechanisms, increasing payment levels, reporting of complaints and changing perceptions about service delivery.

Indigent Leak Repair

Projects were undertaken in the different regions to reduce the water leaks within the households of indigent customers, in order to reduce water losses within these properties.

In order to ensure the sustainability of the programme, the indigent leak repair list should be addressed regularly, as and when required, to prevent build up of backlogs. Out-sourced service providers will have to be appointed to enable implementation of the programme.

4.11 OVERVIEW FOR THE PERIOD JULY 2002 TO JUNE 2005

During this period, the Water Services Division introduced various initiatives that were mainly focused to ensure sustainability of future strategies. While having minimal direct impact in reducing the unaccounted for water figures, these projects were necessary from a strategic point of view, and identified shortcomings of 2002 Water Demand Management Strategy.

Some of the successes achieved with the implementation of the WSDP Water Demand Management Strategy during this period were:

- The customer audit;
- Improved meter reading efficiency;
- Implementation of management programmes (e.g. WEMM, MMS and TRS);
- Introduction of pilot studies, indigent leak repair programme and installation of smart PRV controllers.

Some shortcomings of the strategy were identified, such as:

- The strategy was not comprehensive enough;
- Ad hoc nature of some activities did not ensure sustainability;
- Implementation was not sufficiently coordinated;
- Limited support and buy-in from other departments;
- Inadequate attention to training of employees;
- Insufficient operational funds hampered the sustainability of impact.

A major lesson learnt was the realisation that there are limited “quick fix” solutions for the reduction of “non-revenue” water. The most important principle is that it needs to be ensured that the basics are done correctly, which unfortunately contains the most expensive and time consuming activities. These basics need to be in place before substantial savings can be achieved. Doing the basics well, also results in a better service to customers.

To improve by utilising the lessons learnt from the previous strategy, a new way forward is proposed with a more comprehensive strategy.

SECTION B: PROPOSED WATER DEMAND MANAGEMENT STRATEGY FOR EMM

The Ekurhuleni Metropolitan Municipality has developed a new Water Demand Management Strategy to replace the one described in the Water Services Development Plan of 2002. The main shortcoming of the previous strategy was that it was not comprehensive enough and did not incorporate sufficient enabling mechanisms.

A major focus over the last two years has been the implementation of the necessary structures that will play an important role in future planning processes. The proposed water loss strategy is developed in line with the principles of Department Water Affairs and Forestry, for consumers from the upper and middle Vaal River System.

The new more intensive Water Demand Management Strategy developed in conjunction with Department Water Affairs and Forestry, will reduce non revenue water through the implementation of an aggressive strategy, according to necessary approved policies and standards.

The proposed strategy has to be sustainable and economically viable, with enabling objectives and aligned action plans that can be used to guide implementation of projects. The key focus areas for implementation are effective meter management, reduction in consumer demand and the implementation of a sustainable water loss strategy.

The objective of the strategy is to entrench Water Demand Management as a key service delivery strategy according to the relevant acts, policies and standards; ensuring reduced non-revenue demand, consumer water efficiency, adopting the principles of integrated water resource planning in all decisions pertaining to extending bulk infrastructure.

The strategy should include focus on the following objectives:

- Reduction in commercial losses;

- Improved efficiency in meter reading;
- Improved system assessment and intervention;
- Improved preventative maintenance;
- Employee capacity building;
- Monitoring of network
- Reduction in non revenue water;
- Introduction of manageable supply zones;
- Improved customer care;
- Implementation of equitable tariffs;
- Conservation of water supply.

A detailed WDM strategy with a five year budget will be developed according to this proposal, with the necessary revision of policies.

Summary of Water demand Management Strategy (November 2005)

	FOCUS AREA		OBJECTIVES		PROGRAMME	TASKS
A	Meter management	A1	Reduce commercial losses	1	Water meter audit	Auditing of all supply meters
				2	Validation of billing data base	Validate data with billing system
						Validate data with GIS information
				3	Implementation of meter management system	Control meter reading functions
						Manage reading processes
						Quality control on readings
		A2	Introduce effective meter reading	4	Reading of meters	Monthly reading of supply meters
				5	Correct sizing of meters	MI responsible for sizing of meters
				6	Generating of fault list	Monthly fault list will be generated and repaired
				9	Credit control	Reconnection and disconnections
				10	Illegal consumptions/ tampering	Issuing of tariff
				11	Large bulk consumers	Investigate Remote reading options
						Replacement of top 50 in three regions
		A3	System assessment and intervention	1	Installation of RW control meters	Check RW accounts
				2	Installation of zone bulk meters	Identify zones
						Install water meters
						Read and log zone meters
				3	Installation of sewer flow meters	Measure flows from drainage areas
		A4	Ensure effective preventative maintenance	4	Adopt and implement proactive O & M	Installation of Task Request system
						Investigate pipe replacement programme
				5	Meter replacement programme	Repair programme to replace meters annually
		A5	Employee capacity building	6	Training off staff	Implement aggressive training employees programme
						Evaluate employees
		A6	Monitoring of network	7	Installation of telemetry	Install monitoring equipment
				8	Monitoring demand	Gather all relevant info
						Analyse zone night flows
				9	Water balance	Do monthly water balance

	FOCUS AREA		OBJECTIVES		PROGRAMME	TASKS
B	Water loss management	B1	Reduce non revenue water	1	Leak detection	Introduce effective passive leakage control
						Drafting of tender for leak detection activities
				2	Pressure management	Do control valve audit
						Install PRV's where needed
						Install Smart controllers
		B2	Introduce manageable supply zones	3	Sectorization	Isolate zones
						Mark zone valves
						Install Manzi locks if needed
				4	Water audit	Calculate ILI
						Compare with international KPI's
C	Demand Management	C1	Customer Care	1	Educate public	Customer awareness
						Retrofitting in schools
						Indigent leak repair
		C2	Ensure equitable tariffs	2	New water tariffs	Introduce more equitable tariffs
		C3	Conservation water supply	3	Regulate water conservation in all sectors	Regulate wastage of water
						Ensure the efficient use of water in new developments
						Assist and capacitate consumers to be water efficient

5 DESCRIPTION OF EXISTING INFRASTRUCTURE

5.1 EXISTING WATER SUPPLY INFRASTRUCTURE PER SERVICE DELIVERY CENTRE

5.1.1 Reservoirs and Water Towers

The total storage capacity in each Service Delivery Centre (SDC) is summarised in Table 3.

Table 3: Summary of Storage per SDC

Service Delivery Centre	Reservoirs		Towers		Total
	Number	Storage MI	Number	Storage MI	Storage MI
Alberton	7	142.3	0	0	143.4
Benoni*	5	97.98	4	3.39	101.37
Boksburg	7	165.3	6	9.75	175.05
Brakpan	3	48.3	3	4.6	52.9
Edenvale	4	52.17	0	0	52.17
Germiston	10	192.05	7	9.63	201.68
Kempton Park/Tembisa	8	51.5	0	0	51.5
Nigel	9	61.42	3	0.89	62.31
Springs	7	61.8	6	8.36	70.16
(Midrand - Clayville)	2	22.5	1	0.6	23.1
Total	63	895.32	28	38.32	933.64

* Including 37 MI owned in Rand Water storage reservoirs (7 MI in Vlakfontein + 30 MI in Benoni reservoir) and including new Knoppiesfontein Tower.

5.1.2 Water Pumping Stations

The total number of pumping stations is 35 (The pumping head generally varies between 18 to 80 m (average 45 m).

Table 4: Summary of Water Pump Stations

Service Delivery Centre	Number of Water Pumping Stations
Alberton	0
Benoni	4
Boksburg	6
Brakpan	7
Edenvale	0
Germiston	3
Kempton Park/Tembisa	0
Nigel – Incl Jameson Park	7
(Midrand- Clayville)	1
Springs	7
Total	35

5.1.3 Water Pipe Network

The breakdown of the different diameters and the estimated pipe length for each SDC has been shown during the previous Master Plan to be as summarised in Table 5 below. The estimated total pipe length in the Ekurhuleni area, at the time, was 8261 km. The Master Plan is in the process of being updated and the present pipe length is estimated to be approximately 5% more than that shown below, i.e. 8675 km.

Table 5: Summary of Pipe Network

Service Delivery Centre	Pipe Diameter <= 200 mm	Pipe Diameter > 200 mm	Total	% of Total
	km	Km	km	%
Alberton	581	137	718	8.7
Benoni	945	125	1 070	13.0
Boksburg	1 175	140	1315	15.9
Brakpan	686	77	763	9.2
Germiston	1 411	140	1 551	18.8
Edenvale	397	59	456	5.5
Kempton Park	936	156	1 092	13.2
Nigel	377	90	467	5.7
Springs	666	95	761	9.2
Midrand (Clayville)	45	22.9	68	0.8
Total	7 174	1 019	8 261	100

5.1.4 Control Valves

Pressure reducing valves are installed in some places where high static pressures occur to control pressures in the water distribution systems.

5.1.5 Water Distribution Zones

The distribution systems comprise a total of approximately 146 pressure zones as summarised in Table 6 below and indicated in Figure 7. The RW connections feeding the reservoirs or towers (if not directly supplied) of each distribution zone have also been indicated in Figure 8.

Table 6: Number of Distribution zones per Service Delivery Centre

SDC	No of Distribution zones
Alberton	32
Benoni	18
Boksburg	13
Brakpan	13
Edenvale	11
Germiston	32
Kempton Park	10
Nigel	8
(Midrand - Clayville)	2
Springs	8
Total	146

5.1.6 Infrastructure Replacement Cost - Water

The replacement cost of the water supply infrastructure (including pump stations, reservoirs, water towers, and pipelines (incl. all valves and fittings), but excluding CU connections) has been calculated at approximately R2500 mil (2002 estimate) during the previous Master Planning exercise (breakdown per SDC as indicated in Figure 5 below). This figure will be updated during the Master Planning exercise that is currently underway.

Figure 5: Water Supply Infrastructure Replacement Cost

Figure 6: Wastewater Infrastructure Replacement Cost

5.2 EXISTING WASTEWATER INFRASTRUCTURE PER SERVICE DELIVERY CENTRE

5.2.1 Wastewater Pumping Stations

The total number of wastewater pumping stations is approximately 138, as shown below in Table 7, with the majority in Germiston and Benoni.

Table 7: Summary of Wastewater Pumping Stations

Service Delivery Centre	Number of Wastewater Pumping Stations
Alberton	4
Benoni	36
Boksburg	18
Brakpan	15
Edenvale	5
Germiston	31
Kempton Park/Tembisa	8
Midrand (Clayville)	3
Nigel	4
Springs	14
Total	138

5.2.2 Sewer Pipe Lengths

As discussed in 5.1.3. above, regarding the total length of water pipes, the figures below represent the totals as per the previous Master Plan (currently being updated). The current estimate for total length is 7 250 km.

The breakdown of the different diameters and the estimated sewer pipe length for each SDC, as per the previous calculations, are summarised in Table 8 below.

Table 8: Summary of Sewer Pipe Network per Service Delivery Centre

Service Delivery Centre	Pipe Diameter < 200 mm	Pipe Diameter >= 200 mm	Total	% of Total
	km	km	km	%
Alberton	595.7	109.4	705.1	10.2
Benoni	810.4	152.9	963.3	14.0
Boksburg	783	199.7	982.7	14.2
Brakpan	580.4	110.5	690.8	10.0
Germiston	1043.2	203.8	1247	18.1
Edenvale	211.7	9.9	221.6	3.2
Kempton Park	868.2	108.1	976.3	14.1
Nigel	333.9	57.2	391.1	5.7
Springs	559	100	659	9.5
Midrand (Clayville)	50	18	68	1.0
Total	5 836	1 070	6 905	100

5.2.3 Drainage Districts

The drainage areas have been subdivided according each wastewater care works (WCW). There are a total of 17 WCW that serve the Ekurhuleni area as summarised in Table 9 below and indicated on Figure 8. All the WCW are managed and operated by ERWAT (East Rand Water Care Company).

Table 9: Water Care Works serving each Service Delivery Centre

Wastewater Care Works	Erwat Drainage Districts	Capacity MI/day	Flows MI/day	Replacement Costs	Discharge to	SDC Served in Ekurhuleni
Esther Park	DD1	0.40	0.39	R 1.60 m	Jukskei River	Kempton Park/Tembisa
Olifantsfontein	DD2	108.00	70.27	R 432.00 m	Kaal Spruit	Kempton Park, Edenvale
Hartebeesfontein	DD3	45.00	36.65	R 180.00 m	Rietvlei Spruit	Kempton Park, Edenvale
Ancor	DD5	41.30	26.22	R 165.20 m	Blesbokspruit	Springs
Benoni	DD5	18.00	10.55	R 72.00 m	Blesbokspruit	Benoni
Daveyton	DD5	16.00	7.17	R 64.00 m	Blesbokspruit	Benoni
JP Marais	DD5	21.00	18.00	R 84.00 m	Blesbokspruit	Benoni, Boksburg
Jan Smuts Dam	DD5	9.10	8.40	R 36.40 m	Blesbokspruit	Brakpan
Rhynfield	DD5	13.00	6.87	R 52.00 m	Blesbokspruit	Benoni
Tsakane	DD5	12.40	9.20	R 49.60 m	Blesbokspruit	Brakpan
Herbert Bickley	DD5	10.00	8.39	R 40.00 m	Blesbokspruit	Nigel
Carl Grungling	DD5	6.00	2.50	R 24.00 m	Blesbokspruit	Nigel
Welgedacht*	DD5	35.00	35.00	R 140.00 m	Blesbokspruit	Springs & Benoni
Dekema	DD6	36.00	29.31	R 144.00 m	Rietspruit	Alberton, Germiston
Rondebult	DD6	36.00	18.00	R 144.00 m	Rietspruit	Germiston
Vlakplaats	DD6	83.00	80.00	R 332.00 m	Rietspruit	Boksburg, Brakpan, Springs, Benoni
Waterval	DD6	105.00	102.05	R 420.00 m	Rietspruit	Alberton, Boksburg, Germiston
		595.20	468.97	R 2,380.80 m		

$$\text{ADWF} \\ \text{WWF} = \boxed{539.3155}$$

* Welgedacht WCW, also serves Benoni and replaces the McComb works which has been closed down.

ERWAT also maintains regional sewers in terms of the long term agreement with Ekurhuleni Metropolitan Municipality. The total length of these regional sewers is approximately 120 km with a general operating age of between 5 to 35 years. The general age of the waste water treatment works is between 5 and 70 years.

5.2.4 Wastewater System Replacement Cost

As discussed in 5.1.6. above, the replacement cost of the wastewater infrastructure (pumping stations and pipelines incl. all manholes) has been calculated during the previous Master Plan. This figure amounted to approximately R3 000 mil (2002 estimate), with the breakdown per SDC as previously indicated on Figure 6. Updated figures will be made available in the next Master Plan.

Figure 7: Main Components of Existing Water Distribution System and Zones

Figure 8: Main Components of Existing Wastewater System and Drainage areas

6 FUTURE BULK AND CONNECTOR INFRASTRUCTURE REQUIREMENTS BASED ON MASTER PLANS

6.1 STATUS OF EXISTING MASTER PLANS

Master plans for Water and Wastewater conveyance for Ekurhuleni was done in 2002. Progress regarding the List of Issues that were identified in the plan, were revisited and updated in a 2004 review. The Consulting engineering firm CES, was appointed late in 2005 to prepare updated master plans as well as this WSDP, with the delivery date for the master plans of June 2007. These plans are currently being prepared, with the information being required currently being gathered and captured before the modelling stage can proceed.

As mentioned earlier, the Housing Strategy currently provides for the implementation of 137 000 housing opportunities over the next three years, until 2008/09. This aim has realistically shifted to 2009/10, due to practical and funding limitations. There are further enquiries being made through external funding agencies as to the possibility to provide 230 000 housing opportunities. This possibility will be analysed and discussed in more detail in the new master plan and future WSDP.

6.2 OVERVIEW OF PROPOSED EXPANSION TO INFRASTRUCTURE

Projects necessary to ameliorate existing problems, to cater for the growth in demand and to replace ageing infrastructure have been discussed in detail in the previous master plans. Some of these projects have been completed since, while some are in progress. The detailed projects are reflected in the current budget and are included in the list of projects, attached hereto as Appendix B. These will be reviewed in the context of the new Master Plan, which will produce an updated program for the expansion to infrastructure.

6.2.1 Water Distribution Systems

Rand Water, the bulk water services provider, is responsible for providing the bulk distribution pipelines, pumping stations and regional storage reservoirs, which in turn feed the municipal storage reservoirs. Future water supply infrastructure requirements, as provided by Ekurhuleni, are therefore limited between the bulk connections to the RW system and the end user (consumer unit) connection.

There are a variety of factors that influence the need for the provision of additional infrastructure. RW imposes certain water supply conditions, which require that Ekurhuleni provide additional reservoir storage to reduce the peak loads and maintain ample pressure for upstream users on the RW system. From the previous master planning analyses, it became evident that some distribution zones are fed directly off the RW system, with no additional storage having been provided. This implies that Ekurhuleni would either have to purchase additional RW storage capacity or additional reservoir storage needs to be provided.

New and additional storage reservoirs and pipelines are also required to accommodate the growth in demand due to future development areas. Future infrastructure is also required to ameliorate existing problems such as high static and low residual pressures.

Another factor influencing future infrastructure requirements is the need for Water Demand Management, which requires certain interventions such as the installation of control valves, isolation of distribution zones and bulk metering of distribution zones. Although already implemented in many areas throughout the Metro, further implementation is still required. As discussed elsewhere in this report, WDM practices are extremely important to ensure the

proper management of Water Services, and these capital costs generate savings to a much larger degree.

Proper asset management practices require the regular upgrading and eventual replacement of infrastructure, which also implies a major capital requirement. Assuming a useful life of maximum 50 years for major infrastructure, it stands to reason that the total infrastructure network needs to be replaced in a 50 years cycle, implying that approximately R45 mil needs to be spent annually on asset replacement (2002 estimate).

Considering the above requirements, as they have bearing on the detailed analysis of the condition and requirements of all infrastructure, the situation will be reassessed with the new master plan.

6.2.2 Wastewater Systems

ERWAT provides the regional outfall sewers and wastewater care works (WCW) in Ekurhuleni. The new regional Welgedacht WCW supplements treatment capacity in the DD5 region, and also replaced the McComb WCW, which was decommissioned. Long-term strategic plans by ERWAT as according to their Strategic Facilities Development Plan (May 2000) indicate that the elimination of Dekema WCW is also under investigation. The greatest capacity requirement exists in Drainage District 6, i.e. the Alberton-, Boksburg-, Germiston area. To alleviate this need, a 50 ML/day extension at the Waterval WCW is under construction, which is also funded by MIG Grant Funds and is intended to be operational by January 2008.

As was stated in section above, dealing with water infrastructure, similar drivers exist that continuously require the expansion and upgrading of wastewater infrastructure. The effects of growth, the demands identified through proper Water Demand Management as well as Asset Management requirements all apply to wastewater infrastructure as well.

The process of optimising conveyance (by reducing pumping costs) and treatment costs require the construction of new outfall sewers. Strategies like these have significant implications on the future infrastructure requirements, e.g. the elimination of waste water pumping stations as well as the construction of new gravity outfall sewers.

As with water, asset replacement of wastewater infrastructure is estimated at R53 million per annum (2002 estimate), when assuming a replacement period of 50 years.

As stated in 6.2.1. above, the detailed proposals dealing with these requirements will be reflected in the new Master Plan.

6.3 SUMMARY OF CAPITAL EXPENDITURE TO IMPLEMENT MASTER PLANS

A summary of the estimated capital expenditure, needed at the time, to implement the recommendations of the previous master plan, based on the year 2000 costs, is shown in Table 10 below. These costs (including Preliminary and General costs, Professional fees, but excluding VAT) were estimated to ameliorate existing problems at the time, cater for growth in demand and to accommodate future developments pertaining to the bulk/main water supply and wastewater systems as identified in the individual master plans.

Table 10: Summary of Capital Expenditure to Implement Master Plans per SDC (2000 estimate)

SDC	Total Cost to Implement Wastewater Master Plans	Total Cost to Implement Water Master Plans
	R x 1000 000	R x 1000 000
Alberton	36.6	7
Benoni	60.9	21
Boksburg	39	37
Brakpan	31.6	25
Germiston	45.5	22
Nigel	18.4	2
Kempton Park	22	14.9
Edenvale	11.8	21.6
Springs	7.6	18
Total	273.4	365.5

Since the drafting of the previous master plans, three years have passed wherein the implementation of the previously recommended capital projects have progressed in varying degrees. This implementation program is still underway. Looking at the summaries of the current capital budget and the program as submitted for the next three years (see Chapter 7 below, Table 16), it can be seen that, out of the 2006/07 capital budget of R 107 703 000, an amount of R 99 533 000 is spent on “improved service delivery”, of which R 31 459 000 is for wastewater projects and R 64 607 000 for water projects. The majority of these “service-improvement” projects result from the previous master plan recommendations. A figure of R 5 170 000 is provided to provide new services to households. These are for existing areas where services are lacking, as services to new settlements are provided through the housing program.

Further to the R 107 703 000 for 2006/07, the amounts of R 85 035 790 and R 75 650 000 have been budgeted for 2007/08 and 2008/09 respectively, implying a three year budgeted total of R 268 388 790.

The master plan underway will consider the effect of the improvements already implemented and those in progress, as well as new factors due to growth and changes, and prepare an updated capital projects-list. The details of all current capital projects are listed in Appendix B.

The cost of implementation of the Housing Master Plan is borne by that department, i.e. for the installation of reticulation services for new housing. The need for capital expenditure to supply in this demand is as follows:

Table 11: Summary of Capital Expenditure required to provide Essential Services to Implement Housing Master Plan

	Housing Units	Projected Capital need				
		2005/06	2006/07	2007/08	2008/09	2009/10
TOTAL	137,000	R 175,562,629	R 465,902,042	R 400,427,122	R 273,423,021	R 145,894,714

Due to practical implications and funding limitations, these figures are expected to be moved out for at least one year.

7 FINANCIAL ASPECTS

7.1 INCOME, EXPENDITURE AND CASH FLOWS

The operating expenditure and income from 2003/04 to date, and the projected figures (budgeted) up to the 2008/09 financial year, for water and wastewater, are summarised below.

The increase in proposed tariffs for 2006/2007 will result in the following estimated income:

	Sewer	Water	Total
Total	R373,409,579	R1,222,978,003	R1,596,387,582

This income is reflected in Table 12 below in the column for 2006/07, under the "User charges for Services". Further income is shown below, to make a total Net Operating Income of R 1 663 688 422. With a Net Operating Expenditure of R 1 661 664 979, there is a projected operating surplus of R 2 023 443 for the first time, in comparison to the operating deficits ranging between R 50 million and R 100 million in previous years.

This is however only possible due to an operating subsidy during the year of R 47 703 000, which is transferred back to "Cash-Backed Reserves", resulting in a final R 45 679 557 deficit. This is still an improvement on previous years with the decrease in deficit.

Table 12: Summary of Expenditure and Income on the Operating Account for Water and Wastewater Services

	BUDGET ANNUAL 2003/04	BUDGET ANNUAL 2004/05	BUDGET ANNUAL 2005/06	BUDGET ANNUAL 2006/07	% of Total	BUDGET ANNUAL 2007/08	BUDGET ANNUAL 2008/09
INCOME							
User Charges for Services	R 1,171,649,919	R 1,315,940,072	R 1,437,186,447	1,596,387,582	97%	1,676,206,960	1,760,017,340
Fines	R 500,000	R 265,000	R 272,948	250,000	0%	262,500	275,670
Operating Grants & Subsidies	R 0	R 118,610,955	R 50,000,000	47,703,000	3%	24,075,790	13,650,000
Other Income	R 837,659	R 12,700	R 10,296	1,209,900	0%	1,270,450	1,334,000
OPERATING INCOME GENERATED	R 1,172,987,578	R 1,434,828,727	R 1,487,469,691	1,645,550,482	100%	1,701,815,700	1,775,277,010
Less: Income foregone	R 0	R 0	R 0	-		-	-
TOTAL OPERATING INCOME	R 1,172,987,578	R 1,434,828,727	R 1,487,469,691	1,645,550,482	100%	1,701,815,700	1,775,277,010
Internal Recoveries	R 1,066,312,536	R 953,011,125	R 958,280,649	18,137,940		19,044,820	19,997,060
Internal Transfers - sub-total	R 1,066,312,536	R 953,011,125	R 958,280,649	18,137,940		19,044,820	19,997,060
NET OPERATING INCOME	R 2,239,300,114	R 2,387,839,852	R 2,445,750,340	1,663,688,422		1,720,860,520	1,795,274,070

	BUDGET ANNUAL 2003/04	BUDGET ANNUAL 2004/05	BUDGET ANNUAL 2005/06	BUDGET ANNUAL 2006/07	% of Total	BUDGET ANNUAL 2007/08	BUDGET ANNUAL 2008/09
EXPENDITURE							
Employee Related Costs - Salaries & Wages	R 88,945,127	R 100,910,143	R 106,981,432	113,400,310	7%	119,070,380	125,023,900
Employee Related Costs - Social Contributions	R 22,817,568	R 27,087,643	R 28,712,900	30,435,700	2%	31,957,490	33,555,430
Bad Debts (Provision for Bad Debts)	R 177,414,884	R 182,200,000	R 214,185,874	160,274,130	10%	168,287,840	176,702,230
Depreciation	R 0	R 0	R 0	32,000,000	2%	32,000,000	32,000,000
Repairs and Maintenance - External	R 57,065,013	R 49,821,887	R 62,354,251	112,192,758	7%	120,046,330	128,449,820
Repairs and Maintenance - Internal	R 4,106,600	R 7,552,494	R 8,373,458	6,180,298	0%	6,489,320	6,813,820
Bulk Purchases	R 815,000,000	R 908,064,412	R 971,193,799	1,050,000,000	64%	1,123,500,000	1,202,145,000
Contracted Services	R 54,994,945	R 74,191,133	R 31,553,470	36,149,000	2%	39,040,920	42,164,180
Grants & Subsidies Paid	R 0	R 0	R 50,000,000	-		-	-
General Expenses - Other	R 9,470,881	R 136,305,538	R 26,341,450	90,422,400	6%	53,943,670	33,540,780
TOTAL OPERATING EXPENDITURE	R 1,229,815,018	R 1,486,133,250	R 1,499,696,634	1,631,054,596	100%	1,694,335,950	1,780,395,160
Internal Transfers:							
Interest - Internal Borrowings	R 32,253,302	R 0	R 0	-		-	-
Redemption - Internal Borrowings	R 23,336,064	R 0	R 0	-		-	-
Internal Charges	R 1,013,125,869	R 1,003,693,479	R 1,033,331,642	30,610,383		44,152,620	45,439,022
Internal Transfers - sub-total	R 1,068,715,235	R 1,003,693,479	R 1,033,331,642	30,610,383		44,152,620	45,439,022
NET OPERATING EXPENDITURE	R 2,298,530,253	R 2,489,826,729	R 2,533,028,276	1,661,664,979		1,738,488,570	1,825,834,182
OPERATING SURPLUS/(DEFICIT)	-R 59,230,139	-R 101,986,877	-R 87,277,936	2,023,443		(17,628,050)	(30,560,112)
Contribution to Capital Budget	R 12,225,845	R 14,000,000	R 0	-		-	-
Total Transfers to Cash-Backed Reserves	R 0	R 0	R 0	47,703,000		24,075,790	13,650,000
Total Transfers from Cash-Backed Reserves	R 0	R 798,274	R 0	-		-	-
Unappropriated Surplus/ (Deficit)	-R 71,455,984	-R 115,188,603	-R 87,277,936	(45,679,557)		(41,703,840)	(44,210,112)

For the previous three years, the actual expenditure, as a percentage of the budgeted amounts, was:

2002/03 -	96,02%
2003/04 -	98,94%
2004/05 -	91,09%
2005/06 -	74,80% (*figures to date, final quarter still to be added)

This represents an excellent achievement, especially when considering that expenditure has become increasingly difficult due to very strict procurement procedures, which has had the effect of requiring additional time to the procurement time cycle. A growing trend amongst other metro municipalities in the country is that of not being able to fully spend budgets.

The dominant expenditure on water and wastewater services is for bulk services, which is due to Ekurhuleni's purchase of purified water from Rand Water and the out-sourcing of wastewater treatment to ERWAT.

The figures above were provided by the Ekurhuleni Treasury Department. Separate figures for Water and Wastewater are not available.

7.2 TARIFFS

Section 1 of the Water Services Act (The Act) requires that the tariffs set by a water services authority should be financially sustainable. In Ekurhuleni, this is achieved by ensuring that all costs incurred in providing the service are recovered through the tariff.

As required by the Act, the minimum tariff covers the following:

- *cost of raw water or bulk potable water, plus*
- *cost of overhead and operational costs, plus*
- *cost of capital, plus*
- *cost of replacement and refurbishment and extension, minus*
- *subsidies.*

The National Water Act of 1998 clearly identifies four primary national water pricing goals, i.e.:

- *Improving social equity*
- *Ensuring ecological sustainability*
- *Ensuring financial sustainability*
- *Improving efficiency*

The broad principles used in the compilation of the tariffs to promote the attainment of the tariff setting goals mentioned above are:

1. Tariffs to be based on "efficient costs" (cost to run the water service in a cost effective and efficient manner)
2. Payment to be in proportion to the amount of water consumed. This will promote the more efficient use of water, compared to tariffs which have a large fixed cost component
3. Tariffs should promote the development of competitive business, thus the commercial tariffs should not be loaded with cross-subsidy requirements.

Water

For the 2006/2007 financial year, the proposed water tariff structure remains the same as in the previous year, as does the principle of the higher the consumption, the higher the tariff, in line with water demand management principles.

The bulk potable water price from Rand Water increases by 5%, increasing the unit price of water to R331.22/MI for the 2006/2007 financial year. The tariff increase does not currently make provision for the WRC levy that is payable. The announcement of the levy is still awaited.

Ekurhuleni has just completed a Customer Audit Project. Initial indications are that approximately 45 000 new water meters were identified, that were not previously identified in the billing system.

More emphasis has been placed on maintenance of water reticulation schemes in the 2006/2007 operational budget submission by the Water Services Division. This is in order to attend to neglected reticulation schemes where there is a maintenance backlog, in an effort to ultimately decrease the capital expenditure on rehabilitation work.

Below are the details of the water domestic and industrial tariffs (The complete Schedule of Tariffs is attached as Appendix A).

Domestic Tariff:

Block tariff (kl)	Tariff (Rands)
0-6	0
7-15	5.35
16-30	6.40
31-45	7.85
46-60	8.25
61>	9.00

Other Usage Tariff:

Block tariff (kl)	Tariff (Rands)
0-200	7.40
201-1000	7.30
1001-2500	7.00
2501-5000	6.90
5001-25000	6.70
25001-50000	6.20
>50000	6.15

Wastewater

ERWAT have announced an increase of 5% for the 2006/2007 financial year. As in the case of water, additional erven were identified by the Customer Audit Project which will affect the income. As with water, there has been no structural change to the wastewater charges. The first scale of the domestic tariff has not been increased.

Below are the details of the wastewater domestic and other tariffs. (The complete schedule of the Wastewater Tariffs is attached as Appendix A).

Domestic Tariff:

Block tariff (kl)	Tariff (Rands)
0-6	0
7-15	3.73
16-30	1.20
31-45	1.15
46-60	1.10
61>	0.20

Other Usage Tariff:

Block tariff (kl)	Tariff (Rands)
0-200	3.95
201-1000	3.15
1001-2500	1.75
2501-5000	0.80
5001-25000	0.75
25001-50000	0.70
>50000	0.25

Other Changes

Registered Indigents

The indigent free basic water allocation was increased to 9kl (both water and wastewater). Thus, all registered indigents receive 9kl free basic water and wastewater. Any consumption after 9kl, will be charged as per the normal domestic tariffs. This was done to encourage the indigent household to conserve water, as well as not consume water above 9kl, in line with the income of the household.

Wastewater Consumption Charges

It was proposed that, as of the 1st July 2007, wastewater charges will be for the user's account, and not the owner's account. This has the aim that the user, i.e. the tenant, be encouraged to save on costs, as opposed to the current system where the tenant have very little concern as regards to usage costs.

Comparison between 2005/06 and 2006/07 tariffs

Domestic Tariffs:

Consumption	Water Account		Sewer Account		Total Account			
	2005/6 -R-	2006/7 -R-	2005/6 -R-	2006/7 -R-	2005/6 - R -	2006/7 -R-	INCREASE - R -	INCREASE %
0-6	0	0	0	0	0	0	0	0
15	46.35	48.15	33.57	33.57	79.92	81.72	1.80	2.25%
30	137.55	144.15	50.07	51.57	187.62	195.72	8.10	4.32%
45	247.05	261.90	64.02	68.82	311.07	330.72	19.65	6.32%
60	360.9	385.65	76.02	85.32	436.92	470.97	34.05	7.79%
100	751.62	781.65	76.02	94.12	827.64	875.77	48.13	5.82%

Other uses:

Consumption	Water Account		Sewer Account		Total Account		
	2005/6 -R-	2006/7 -R-	2005/6 -R-	2006/7 -R-	2005/6 - R -	2006/7 -R-	Increase %
0							
200,00	1 400,00	1 480	770,00	790	2 170,00	2270	5%
800,00	5 600,00	5 860	2 570,00	2 650	8 170,00	8510	4%
2 500,00	16 900,00	17 820	5 645,00	5 855	22 545,00	23675	5%
10 000,00	63 150,00	66 445	11 070,00	11 605	74 220,00	78050	5%
25 000,00	152 400,00	160 195	21 570,00	22 855	173 970,00	183050	5%
75 000,00	448 650,00	462 695	39 070,00	46 605	487 720,00	509 300	4%

Maintenance Levy

A maintenance levy was introduced in the 2005/2006 financial year, with the funds raised through the levy (estimated at R12 million) being “ring-fenced”. The income resulting from this “levy” is used exclusively for refurbishment of the existing water and wastewater reticulation schemes in Ekurhuleni. The aim of these funds is to limit increased capital expenditure and increased reactionary maintenance expenditure.

In total, an overall average increase in maintenance levy of 5.07% has been proposed for domestic water consumption and 5% for industrial consumption. For wastewater, an increase of 6.4% for domestic consumption and 5.2% for industrial consumption has been proposed. The average increase on the total services account is 4.94% for domestic customers and 5% for other customers.

The additional increase is necessary due to a lack of funds on the operational budget, resulting in maintenance work being neglected.

7.3 CAPITAL EXPENDITURE

A three-year capital expenditure program has been prepared by the Ekurhuleni Manager: Water & Wastewater based on the requirements of the Service Delivery Regions and the Master Planning output. The tables below present summaries of the three year budget, giving the proposed expenditure summarised in terms of IDP Strategies, Metro objectives, Impact areas, Service Delivery Regions, etc. The detail list of all the projects is attached at the end of this document as Appendix B.

The total capital expenditure for the water and wastewater functions, as budgeted for the next three years, amounts to R268 388 790. This is a far cry from the approximately R 1 billion (5-years) that was reported in the previous WSDP (2002). The budget for the next financial year, from all funding sources, is R 107 703 000. Considering the size of the Metro and the service need, these funds are inadequate to ensure sustainable service delivery and the addressing of the backlog.

The situation is alleviated somewhat by the fact that the cost of provision of some of the bulk services is borne by Rand Water and ERWAT, while the installation of new reticulation services in new Housing Projects is budgeted under the project costs, currently under the budget of the Housing Department. With regard to five year expenditure program on bulk sanitation and treatment works, the proposed expenditure from ERWAT is shown in Table 21 below.

Table 13: Summary of Capital Expenditure – Expenditure per GFS Sub-Class

GFS Sub-Class	2006/2007	2007/2008	2008/2009	Project Total
Sewerage Sub-Total	31,989,000	30,670,790	31,430,000	94,089,790
Water Distribution Sub-Total	72,247,000	53,015,000	42,852,000	168,114,000
Water Storage Sub-Total	3,467,000	1,350,000	1,368,000	6,185,000
Total Budget	107,703,000	85,035,790	75,650,000	268,388,790

Table 14 : Summary of Capital Expenditure – Expenditure per Asset Sub-Type

Asset Sub-Type	2006/2007	2007/2008	2008/2009	Project Total
Sewerage Purification reticulation Sub-Total	31,989,000	30,670,790	31,430,000	94,089,790
Water Reservoirs & Reticulation Sub-Total	69,214,000	48,315,000	38,390,000	155,919,000
Office equipment Sub-Total	800,000	800,000	800,000	2,400,000
Vehicles, Plant & Equipment Sub-Total	4,200,000	4,200,000	4,200,000	12,600,000
Other Land and Buildings Sub-Total	1,500,000	1,050,000	830,000	3,380,000
Total Budget	107,703,000	85,035,790	75,650,000	268,388,790

Table 15: Summary of Capital Expenditure – Expenditure per Service Delivery Region

Service Region	2006/2007	2007/2008	2008/2009	Project Total
Alberton Sub-Total	3,300,000	3,560,000	4,180,000	11,040,000
Benoni Sub-Total	31,660,000	24,925,000	16,230,000	72,815,000
Boksburg Sub-Total	13,566,000	8,210,000	7,800,000	29,576,000
Brakpan Sub-Total	1,510,000	2,560,000	3,350,000	7,420,000
Daveyton Sub-Total	1,660,000	2,500,000	2,000,000	6,160,000
Edenvale Sub-Total	3,700,000	5,000,000	6,800,000	15,500,000
Germiston Sub-Total	16,019,000	12,150,790	9,183,000	37,352,790
Kempton Park Sub-Total	1,100,000	1,150,000	3,000,000	5,250,000
Nigel Sub-Total	1,700,000	1,030,000	700,000	3,430,000
Springs Sub-Total	2,710,000	3,600,000	5,870,000	12,180,000
Tembisa Sub-Total	18,757,000	7,950,000	4,707,000	31,414,000
Vosloorus Sub-Total	4,833,000	4,900,000	3,080,000	12,813,000
Corporate Sub-Total	7,188,000	7,500,000	8,750,000	23,438,000
Total Budget	107,703,000	85,035,790	75,650,000	268,388,790

Table 16: Summary of Capital Expenditure – Expenditure per Impact Category

Impact	2006/2007	2007/2008	2008/2009	Project Total
Improved service delivery – Sewerage	31,459,000	28,720,790	29,680,000	89,859,790
Improved service delivery – Water Distribution	64,607,000	47,855,000	41,872,000	154,334,000
Improved service delivery – Water Storage	3,467,000	1,350,000	1,368,000	6,185,000
Improved service delivery - Sub-Total	99,533,000	77,925,790	72,920,000	250,378,790
Reduction of Maintenance Losses	2,950,000	2,250,000	500,000	5,700,000
Management	50,000	710,000	730,000	1,490,000
Services to Households & Stands - Sewerage	480,000	1,700,000	1,500,000	3,680,000
Services to Households & Stands - Water	4,690,000	2,450,000	-	7,140,000
Services to Households & Stands - Sub-Total	5,170,000	4,150,000	1,500,000	10,820,000
Total Budget	107,703,000	85,035,790	75,650,000	268,388,790

Table 17: Summary of Capital Expenditure – Expenditure per Growth and Development Strategy Focus Area

GDS Focus Area	Good Governance	Services Infrastructure	Total
MI: Water and Wastewater - 2006/07	5,100,000	102,603,000	107,703,000
TOTAL	173,685,598	375,819,054	549,504,652
MI: Water and Wastewater - 2007/08	5,100,000	79,935,790	85,035,790
TOTAL	149,280,994	313,973,790	463,254,784
MI: Water and Wastewater - 2008/09	5,100,000	70,550,000	75,650,000
TOTAL	130,098,032	324,191,000	454,289,032

Table 18: Summary of Capital Expenditure – Expenditure per IDP Strategic Issue

IDP Strategic Issue	Housing development	Operational requirements	Other	Total
MI: Water and Wastewater - 2006/07	1,500,000	1,000,000	105,203,000	107,703,000
TOTAL	313,494,885	235,935,015	596,515,435	1,145,945,335
MI: Water and Wastewater - 2007/08	3,000,000	500,000	81,535,790	85,035,790
TOTAL	255,320,200	183,507,884	591,951,715	1,030,779,799
MI: Water and Wastewater - 2008/09	3,050,000	-	72,600,000	75,650,000
TOTAL	200,957,000	196,953,050	578,418,800	976,328,850

Table 19: Summary of Capital Expenditure – Expenditure per Metropolitan Priority Objective

Metro Priority	Good governance	Equipment	Infrastructure	Total
MI: Water and Wastewater - 2006/07	101,703,000	5,000,000	1,000,000	107,703,000
TOTAL	350,532,685	110,518,598	1,003,045,230	1,464,096,513
MI: Water and Wastewater - 2007/08	79,785,790	5,000,000	100,000	84,885,790
TOTAL	282,325,647	101,849,234	908,979,642	1,293,154,523
MI: Water and Wastewater - 2008/09	70,270,000	5,000,000	230,000	75,500,000
TOTAL	218,913,315	100,496,950	853,734,158	1,173,144,423

Table 20: Summary of Capital Expenditure – Expenditure per Ward Category

Ward Category	2006/07		2007/08		2008/09	
	MI: Water & Wastewater	TOTAL	MI: Water & Wastewater	TOTAL	MI: Water & Wastewater	TOTAL
Underdeveloped	R 47,353,000	R 575,075,497	R 30,945,000	R 517,468,591	R 20,250,000	R 463,700,775
Developed, Residential	R 9,150,000	R 80,507,500	R 8,600,000	R 55,440,500	R 4,300,000	R 50,401,966
Developed, Industrial, Commercial, CBD	R 1,800,000	R 30,703,000	R 200,000	R 25,439,000	R 2,500,000	R 32,521,000
Mixed Wards	R 41,812,000	R 294,718,293	R 36,890,790	R 245,784,199	R 39,250,000	R 270,838,351
Multi-ward Projects	R 3,788,000	R 621,775,586	R 4,600,000	R 568,457,726	R 5,550,000	R 557,052,066
Operational Equipment	R 3,800,000	R 95,024,247	R 3,800,000	R 87,974,716	R 3,800,000	R 77,330,000
Total	R 107,703,000	R 1,697,804,123	R 85,035,790	R 1,500,564,732	R 75,650,000	R 1,451,844,158

Table 21: Five Year Capital Expenditure on Sanitation - ERWAT Capital Programme**CAPITAL EXPENDITURE BUDGET 2005 - 2010**

		2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
DD3	Hartebeestfontein WcW : Upgrading	R 40 000 000	R 30 000 000			
DD6	Ancor WcW : Upgrading Inlett Works		R 5 000 000			
DD5	Benoni WcW : Utilisation Planning		R 200 000			
DD5	Daveyton WcW : Inlett Works		R 2 000 000	R 3 000 000		
DD5	J.P. Marais WcW : Sludge Handling			R 5 000 000		
DD5	Jan Smuts Dam WcW : Sludge Handling			R 100 000		
DD5	Herbert Bickley WcW : Anaerobic Digesters		R 2 000 000			
DD5	Ratanda WcW : Aerators & Drying Beds	R 700 000				
DD6	Waterval WcW : New Module	R 40 000 000	R 70 000 000	R 70 000 000		
DD6	Waterval WcW : Sludge Handling (Planning)	R 3 000 000	R 3 000 000	R 3 000 000		
DD6	Vlakplaats WcW : Disinfection		R 1 500 000			
DD6	Vlakplaats WcW : Bypass sewer	R 5 000 000	R 3 000 000			
DD6	Vlakplaats WcW : EO Sludge Filter	R 500 000				
DD7	Dekema WcW : Electrical Supply		R 1 000 000			
DD8	Dekema WcW : Sludge Ponds		R 310 000			
DD6	DD6 Regional Sewers : Increased Capacity					R 20 000 000

7.4 SOURCES OF FINANCE FOR CAPITAL EXPENDITURE

The sources of finance for capital expenditure on the water supply and wastewater functions are shown in Table 22 below. The table shows the budget allocation per year from the relevant funding sources, and for sake of comparison shows the relevant expenditure on housing from those same sources. As mentioned before, services to new housing are installed from these funds and include water and wastewater services. It is not possible to identify the proportion of this spending on these services.

The totals shown as EMM Totals, is the total Metro budget on all services from these sources.

Table 22: Summary of Capital Expenditure – Expenditure per Funding Source

Funding Source	CRR	External Loans	MIG	PHB	Total
Housing	765,000	39,235,000	-	281,593,700	321,593,700
MI: Water and Wastewater	5,000,000	55,000,000	44,937,000	-	104,937,000
EMM TOTAL	273,408,698	395,605,302	357,767,288	281,593,700	1,308,374,988
Housing	780,000	39,860,000	-	205,200,000	245,840,000
MI: Water and Wastewater	5,000,000	55,960,000	24,075,790	-	85,035,790
EMM TOTAL	264,181,492	382,724,008	235,528,590	205,200,000	1,087,634,090
Housing	1,030,000	40,970,000	-	135,600,000	177,600,000
MI: Water and Wastewater	5,000,000	57,000,000	13,650,000	-	75,650,000
EMM TOTAL	231,824,850	450,279,150	216,520,000	135,600,000	1,034,224,000

7.5 AFFORDABILITY AND NON-PAYMENT

Since the formation of Ekurhuleni Metro Municipality and the implementation of standard unit tariffs throughout the service area, an affordability study has not been undertaken. It should be considered that such a study, to determine the extent of non-payment, the causes thereof, as well as the effect of tariffs on affordability, be undertaken.

7.6 AWARENESS PROGRAMMES/MEASURES TO IMPROVE PAYMENTS

The Marketing and Communications department has an existing awareness campaign for general municipal communication. It has been stated that an integrated Communications and Marketing campaign should be produced, which should incorporate the actions as being proposed and undertaken through the SIWDM plan.

While the SIWDM plan is still being finalised, it inter alia contains the following sections:

- Stakeholder management: Stakeholders are described as any person or organisation that may affect, or be affected, and are represented through a water committee, water user associations, catchments management agencies, non-governmental organisations and environmental forums. These organisations have the right to discuss, form opinions and contribute to decisions about how the water resources can be used and for what purposes.
- Education and awareness: Details of the content of this section is being drafted.
- Communication: As above
- Cooperative governance: As above
- Marketing: It is planned that marketing of water resource management plans will be done through education and awareness programs and the Marketing and Communications department. The details of the content of this section are still being drafted.

8 ORGANISATIONAL ARRANGEMENTS

The Ekurhuleni Metropolitan Municipality (EMM) is a relatively new municipality that was formed in 2000 through the joining of the several local municipalities of the former East Rand into one of the 6 metropolitan municipalities in South Africa.

As discussed in detail earlier, the provision of bulk services is undertaken by external service providers like Rand Water and Erwat. In the Ekurhuleni Metropolitan Municipality, the provision of water services happens under the auspices of the Executive Director: Municipal Infrastructure who makes up part of the top management structure of the Metro. More directly, these services are provided by two Directors in Water Services, namely Planning and Construction and Operations, each with his respective staff. Services are further delivered locally by three Regional Directors within the whole of Ekurhuleni. Thus the total service is delivered through a head office/corporate component, with operations delivered through the offices of three Service Delivery Regions (SDRs), i.e. the North, South and East regions respectively.

Though these are the formal organisational structures delivering water services, the total water services delivery process includes many other structures in an integrated fashion. To ensure the continuity of the WSDP process and the buy-in and participation of all role players, a WSDP forum was created in which all affected departments are represented. These include the departments of Health, Environment Planning, Finance, Marketing and Communications and the SDR's. The forum meets quarterly to discuss and resolve the issues of the day and progress with regard to water services.

While not yet fully functional, catchment management agencies are involved with catchment management. Their role and that of the River Forums are discussed in Chapter 9 below.

The Water Services Department also has to ensure that it participates in committees and work groups where the requirements i.t.o. water services are to be represented, e.g. the Dolomite Risk Management Steering Committee, consisting of representative officials of all the departments involved with risk management of dolomite. Water Services officials need to represent the department in the further structures concerned with this issue, i.e. the Dolomite Infrastructure Management Task Team, the Dolomite Awareness Task Team and Dolomite Emergency Reaction Task Team.

9 ENVIRONMENTAL ASPECTS

9.1 WATER RESOURCE PROTECTION

Rand Water is the major Bulk Water Services Provider for potable water in the Ekurhuleni Metro. While Rand Water is responsible to monitor the quality of the resources and to perform bulk resource planning and development, the DWAF is the custodian of water in South Africa and the responsibility for the protection of the water resource should be shared by all role players.

The Metro is also responsible to monitor the quality and protect the resources in the municipal boundaries of the Metro. While the quality of surface water is monitored on a monthly basis, very little attention is given to ground water protection and the role of different departments needs to be identified. Little attention is given to the effect of alien plants that draw water from water courses and invasive plants that have a negative impact on the water source, for example reeds, algae and hyacinths. These can also have a negative impact on the biodiversity of water sources, such as fish, micro organisms, habitat and invertebrates. The EMM must assist to insure that the water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all.

Strategic Integrated Water Resource Management Plan (SIWRMP)

During 2002, a State of the Environment Report (SoER) was compiled by the EMM with the purpose of providing environmental information to decision-makers to make informed decisions. The EMM embarked on a process to formulate a Strategic Integrated Water Resource Management Plan (SIWRMP). The purpose of the SIWRMP is to strike the right balance between development needs and service delivery, in the interest of human health and well-being, whilst ensuring environmental integrity in terms of stormwater management, waste management, pollution control, and resource conservation. Striking this balance is challenging and it requires all spheres of the government to participate. The SIWRMP will be utilised for protection, rehabilitation and management of the water resource within and around Ekurhuleni Metro Municipality.

This initiative by Ekurhuleni Metro Municipality certainly indicates a move in the right direction. During the recent gathering of the South African Cities Network (SACN), held at the City Hall in Nelson Mandela Metropolitan Municipality (NMMM) on 23 March 2006, a workshop was held. The aim of the workshop was to introduce the Integrated Water Resource Management Plan (IWRMP) Guideline discussion document to the larger local authorities and Department of Water Affairs and Forestry (DWAF) regional offices. It also aimed to gauge the response to the concept of an IWRMP.

During the workshop, in discussing the Strategic perspective: Water Services and Local Government, Fred van Zyl, DWAF Water Services, said the following:

“Local government’s responsibilities for water services are subject to national and provincial regulations. There are currently 283 local authorities in South Africa as at 23 December 2005 and 170 of these are water services authorities (WSA). Management capacity within these local authorities varies from well to poorly developed. Domestic and municipal water resource management is the responsibility of all municipalities but is not yet well institutionalised.

Local authorities have WRM accountability, which is reflected in the Municipal Systems Act, Act 32 of 2000. They also have multiple roles which need to be understood – local authorities are users, impactors, managers, facilitators, structural planners and coordinators.

Performance challenges of a local authority include: creating prosperity (social, economic and environmental), provision of water supply and sanitation services, ensuring effective WRM and ensuring viable and sustainable business.

The IDP and WSDP do not effectively address the following WRM issues:

- *Point and non-point pollution of water resources;*
- *Serious water losses;*
- *Institutionalisation of WRM;*
- *Recognition of water resources as an economic good;*
- *The implications of social, economic and environmental issues on water resources.*

Service provision needs to consider infrastructure and sustainability. The following [are some of the] issues of concern:

backlog figures also includes non functioning systems, which are operational problems rather than true backlogs.

WRM is not understood in local authorities hence WRM is not institutionalized and there is no coherent approach to implementation.

Key governance success factors and challenges in IWRM include political will, knowledge and ownership, a business management approach, sufficient resources, skills, teams, champions and an enabling environment, among others.”

The Ekurhuleni SIWRMP is still in the process of being finalised, with some chapters still being drafted. Chapters will include a strategy for protection of water resources within EMM, strategies and requirements for monitoring, sampling and pollution management, a discussion of the relevant by-laws and enforcement measures, the education and awareness plans, a disaster management plan, communication and marketing plans, as well as the proposed implementation programme of projects and the action plans.

9.2 RETURN FLOWS AND SURFACE WATER QUALITY

The effluent from the wastewater treatment works is discharged into tributaries of the Blesbokspruit, Kliprivier, Olifantsfontein and Hartebeesfontein. The East Rand Water Care Company (ERWAT) monitors the quality of effluent discharged into these rivers from the wastewater care works. All incoming flows and treated effluent are monitored and analysis results are provided to the Metro and DWAF on a continuous basis. Monitoring upstream and downstream from discharge points also takes place.

Within the boundaries of the EMM, the chemical and bacteriological quality of the stormwater and river systems is monitored on a regular basis, monitoring points are identified to include all possible impacts on the surface water. Discharge from wastewater care works, urban runoff, sewer blockages, industrial activities and mining activities are the major factor impacting on the water quality of surface water. The nitrification and salination of water resources are two of the major problems in the EMM boundary.

From a Health and Social Development point of view, the IPC is involved with the following types of motoring:

- Bacteriological (monthly),
- Chemical - on a complaints basis only,
- Physical parameters of streams (e.g. temperature, conductivity, dissolved oxygen, PH, etc.),
- Reporting of color change, algae, smell and littering around water sources.

9.3 WATER CONSERVATION MANAGEMENT

The Catchment Management Agencies (CMAs) are still not fully up and running. Currently the Department of Water Affairs and Forestry is still managing this function. The river forums are functioning and are reporting on monitoring and activities taking place in the catchments, although the forums do not have any legal powers. DWAF is in the process to develop a catchment management strategy. All the relevant departments in the EMM should be involved in the different river forums.

With regard to integrated pollution control and waste management, a master plan for the Kaalspruit is in the process of being developed.

As mentioned in Chapter 3 and Chapter 8 above, the proper management of risks in terms of the presence of dolomite in the area is extremely important. A Dolomite Risk Management System has been adopted by Council, whereby a Dolomite Risk Management Section is to be formed, supported through a variety of structures, i.e. the Dolomite Infrastructure Management Task Team, the Dolomite Awareness Task Team and the Dolomite Emergency Reaction Task Team. These structures will be representative of all departments involved and other service providers like Eskom, Telkom, etc. They will perform a variety of tasks, including:

- Management of the Dolomite Risk Management System
- Policy, Procedures, Guidelines, Standards and Database
- Insurance
- Inspections
- New Developments
- Preventative Maintenance
- Upgrading of Infrastructure
- Drainage of Erven
- Community Training and Awareness
- Response on occurrence of a sinkhole or doline

These structures will be overseen by a Dolomite Risk Management Steering Committee, consisting of representative officials of all the departments involved.

10 ISSUES

During the drafting of this WSDP, several issues were identified. These should receive attention and are listed below.

NOTE: The issues listed below do not follow from the comprehensive list of issues identified during the previous WSDP update. The issues identified previously have received attention and have been dealt with to various levels of detail. As most of these issues are addressed through the Master Planning exercise, the specifics will be updated and reported on through that process, which is currently underway.

Issues:

1. Information availability and validity: The WSDP Guidelines, and good management practice, demand the availability of up-to-date and valid data and information. These needs are becoming continuously more comprehensive, as the demands for performance management and – reporting keep escalating. The nature of the data and information required are varied in nature, from technical and operational data, demographic information, financial and social. It needs to be consistent in format and able to be analysed to determine trends, causes, effects, etc. Effort should be made to put comprehensive processes in place to ensure the regular gathering of data, data capturing and analysis, having up-to-date databases available, both in water services, socio-economics (incl. demographics) and finance.
2. Services Backlog: The total elimination of the “backlog” in the provision of services has long been a service delivery aim. This so-called backlog is in many ways a misnomer, as backlogs get eliminated while a new backlog continues to form due to growth elements, caused by a variety of factors such as migration and new development. This phenomenon needs to be recognised for what it is, a base of new customers, who needs to be provided with services within a reasonable time frame. Consideration should be given that a “backlog base” of certain magnitude should be recognised and acknowledged as a growth in the customer base.
3. Un-serviced CU: While a lot of accent is placed on the provision of new services to green-fields developments and due to growth, a survey is required to determine and confirm the extent of the un-serviced CU in existing areas. This would quantify the true backlog in service delivery and should receive priority attention.
4. Water Quality - Projects: As was described in Chapter 4, Water Quality and Chapter 9, the following projects need to be undertaken:
 - Assessment of ecological state of major rivers and streams,
 - Borehole census and ground water assessment,
 - Investigation of certain chemical spillages that may require further assessment in terms of their penetration abilities and effect on the environment.
 - The effect of alien plants that draw water from water courses and invasive plants that have a negative impact on the water source, needs investigation.
 - The nitrification and salination of water resources, two of the major problems in the EMM boundary need to be dealt with.
5. Water Quality - Integration: The responsibility for water quality is not solely that of the Municipal Infrastructure Department (Water Services Division), but should be shared by other departments. These responsibilities should be discussed, identified and

acknowledged at all management levels. Ways of assuring water quality in an integrated approach should become standard operating procedure.

6. Water Quality – Various Issues:

- Several different detail issues pertaining to water quality (run-off and effluent) has been identified which needs to be addressed:
- During summer months, the drop in chlorine levels in the water at some of the EMM sampling points and the simultaneous increase in HPC (what does the acronym stand for) needs further investigation and resolution.
- Sewerage pollution sometimes occurs from blockages and failure of the Dunswart pump station, while another source of pollution was found, i.e. illegal connections of grease traps to the stormwater system. These sources of pollution need to be eradicated.
- A further example of pollution is at Jan Smuts dam, a shallow natural pan close to the Brakpan CBD, which has no natural outlet. The primary purpose of this water body is to act as a receiving pond for stormwater and as an outlet for treated effluent discharge from the Jan Smuts Water Care Works. Polluted inflow, the absence of natural stormwater and no outlet contribute to susceptibility to eutrophication and excessive enrichment with algal growth nutrients.
- The problems above are exacerbated by the cessation of maintenance due to changes in the institutional framework, which still has to be resolved.
- Detailed recommendations have been made in a previous report, which include obtaining analysis results from the master plan and making proper institutional arrangements for the management of the site. These measures need to be implemented as a matter of urgency, together with remedial steps to address the issues at the Steward Pan.

7. Water Quality Monitoring and Action: The quality of water flowing from within the metro boundary, such as rain water, underground water or streams and rivers passing through the Metro, has to be monitored. This should be both for monitoring of pollution and/or contamination and for quality recording and the maintaining of a quality database.

8. Furthermore, in the many cases where it is possible to trace the source the pollution, appropriate action should be taken.

9. Ground Water Quality - Monitoring and Protection: The Metro is also responsible to monitor the quality and protect the resources in the municipal boundaries of the Metro. While the quality of surface water is monitored on a monthly basis, very little attention is given to ground water protection and the role of different departments needs to be identified

10. Integration: While there has been great improvement in achieving some degree of integration, e.g. through the budgetary process and the WSDP Forum, there is still room for improvement in establishing processes/mechanisms for cooperation with other departments and role-players. There is still too much of a perception that the provision of water services is purely an engineering function.

11. Similarly, the issues as discussed above demonstrate the need for all departments to be involved in pollution prevention at all levels.

12. AIDS: The impact of AIDS is still unknown, both the current reality and the projection of the potential future impact of the calamity. Part of the problem is that, due to the nature of the problem, information is insufficient and the validity of information in doubt. The appropriate authorities and role-payers should urgently find ways of overcoming this problem. Consideration should be given to the undertaking of a formal investigation into the Aids phenomenon, as related to the potential effect on water demand.

13. **Tariffs:** One of the prime motivations for the implementation of the block tariffs was to provide an incentive to save water, vice versa to penalise consumers who wasted water. There has still never been a study done to determine the effect of tariffs on consumption. Such a study should be undertaken to determine the optimal approach to be taken in this regard.
14. **Affordability:** As discussed in Chapter 7, it should be considered that an affordability study be undertaken to determine the extent of non-payment, the causes thereof, as well as the effect of tariffs on affordability.
15. **Water Demand Management Strategy (WDMS):** In terms of the new Water Demand Management strategy, incorporated into the new Water Master Plan, the new five year Water Demand Management Program needs to be finalised.
16. **IWRMP:** The draft Strategic Integrated Water Resource Management Plan needs to be finalised and formalised. This integrated water services management approach, incorporating the vital elements of the SIWRMP, the WDMS above, the WSDP, Master Plans, etc. will ensure that generally accepted good management practice prevails with the buy-in and cooperation of all role-players.
17. **Economic Upliftment:** The Integrated Water Resource Management approach, amongst other elements, stresses the municipality's role in ensuring the economic viability of the local area. In order to ensure a viable Metropolitan Municipality, economic upliftment of the areas is essential. Plans and proposals in this regard needs to be developed and implemented to ensure, through economic upliftment, that water services delivery remains sustainable.
18. **Management and maintenance plan (MMP):** The compilation of management and maintenance plan (MMP) for the current telemetry systems within the municipality has to be completed.
19. **Indigent Leak Repair:** Projects were undertaken in the different regions to reduce the water leaks within the households of indigent customers, in order to reduce water losses within these properties. It is essential for the indigent leak repair list to be addressed regularly, to prevent build up of backlogs. Out-sourced service providers will have to be appointed to ensure implementation of the programme.
20. **Housing:** As discussed in various sections of the report, the possibility of a 230 000 unit housing project has been identified. The reality in terms of short to medium term housing provision needs to be clarified. The possibility of the implementation of such huge housing targets will be dependant on practical realities, of which the provision of water and other infrastructure service are of primary importance. Legal processes and procurement time frames also affect housing delivery, as does a variety of other processes. A realistic time frame needs to be agreed, to allow proper planning of water services. The issue will be addressed in the new master plan.
21. **Operational requirements:** Exceptional growth, due to factors such as Housing mentioned above, would have extraordinary demands on operational ability, as well as the cost implications thereof. These implications need to be identified, quantified and defined explicitly and would require approval concurrently with the capital implementation approvals.
22. **Economic Viability:** As reported, little is done to nourish and grow the economically active customer profile on which the viability of the Ekurhuleni depends. Policy in this regard needs to be reviewed to ensure the sustainability of the Metro.

23. Customer Profile: Deeper insight is required into customer preferences and research is required to add to the general information that is currently available. The research should be integrated with the wider research into customer information.
24. Rand Water – Storage Capacity: In terms of the new Bulk Service Agreement entered into with RW the storage capacity is to be determined per connection point. The individual connection point supply is still to be finalised.
25. Minimum Services Standards for Housing: The provision of reticulation services for new housing is undertaken by the Housing Department. A current risk is that there is no official minimum standard for water services according to which this service provision is implemented. While good communication currently ensures that acceptable standards are upheld, formal standards should be identified, agreed and approved, given that there are approximately 137 000 residential CU with none or inadequate wastewater services, while 480 000 are provided with waterborne sewer connections.

APPENDICES

APPENDIX A

SCHEDULE OF TARIFFS FOR RENDERING WATER & SANITATION SERVICES

A. EKURHULENI METROPOLITAN MUNICIPALITY: SCHEDULE OF TARIFFS FOR RENDERING OF WATER SUPPLY SERVICES AND INCIDENTAL CHARGES

The amounts due for water services for the 2006-2007 financial year BE PAID on dates as indicated on accounts which will be rendered from 1 July 2006.

1. ALL TARIFFS LISTED BELOW OR TO BE CALCULATED IN TERMS OF THIS SCHEDULE OF TARIFFS EXCLUDE VAT.

2. WATER TARIFFS

Charges shall be levied in respect of each separate connection for water (as defined in the Water Supply By-laws of the Council). It is further noted that the tariffs effective to consumption as from 01 July 2006 and accounts as from those generated in July 2006 on a pro rata basis where applicable, will be levied.

3. CONSUMPTION TARIFFS

All tariffs listed in items 3.1, 3.2, 3.4, 3.8, 3.9, 3.10, 3.11, 3.12, 3.13, if not excluded in terms of the agreement, shall be applied accumulatively.

3.1 Household use (Tariff Code WA0017)

Except where the tariffs listed in items 3.3 below are applicable, the tariffs listed in this item shall be payable where water, used solely for household purposes, has been supplied. The property zoned "Z.A.R", "general residential" or "residential 1,2,3,4 or 5 (residential 5 – for residential purposes only)" in terms of a town-planning scheme and which are used exclusively for that purpose, shall be applicable. In the case of hostels and old age homes, every 4 beds shall be deemed to be a residential unit. Any premises zoned "Residential 1" and which is used exclusively for residential purposes, is regarded as one residential unit.

- This tariff is only applicable for properties zoned as detailed in 3.1 above.
- In the event that a small business is run from a property zoned Residential as detailed above, **and** the connection size is either a 15mm or 20mm connection, the tariffs in the table below shall apply. Any connection which is greater than 20mm and the property is not exclusively used for residential use, shall be charged in the tariffs as detailed in 3.5 below
- That an additional 3 kl free basic consumption be granted to all registered indigent account holders.
 - The additional 3 kl is only applicable to registered indigents, as defined in the Indigent Policy, where the registered indigent is:
 - The owner of the property
 - The occupant of the property concerned
 - Has no other independent occupants on the property concerned

TARIFF SUMMARY	TARIFF R/KL
Number of residential units x (0 – 6 kl / month)	0
Number of residential units x (7 – 15 kl / month)	5.35
Number of residential units x (16 – 30 kl / month)	6.40
Number of residential units x (31 – 45 kl / month)	7.85
Number of residential units x (46 – 60 kl / month)	8.25
Number of residential units x (61 or more kl / month)	9.00

3.2 Institutional Uses (Tariff Code WA0009)

(State assisted public schools, public hospitals, churches and welfare organisations having been registered by the National Department of Social Development or its predecessors.)

The tariff payable in terms of this item is as follows:

TARIFF SUMMARY	TARIFF R/KL
Fixed Rate	R5,70

3.3 Informal Settlements (Tariff Code WA0008)

TARIFF SUMMARY	TARIFF R/KL
This item is applicable in cases where stands and/or dwelling units are supplied by means of a standpipe (no stand connection available)	R0, 00

3.4 The tariffs listed in this item are payable in respect of all uses not listed in items 3.1, 3.2 and 3.3 (Tariff Code WA0011)

These tariffs apply to e.g. the following uses: business, commercial, industrial, government, mining, private schools, crèches, sport clubs, private hostels and clinics.

TARIFF SUMMARY	TARIFF R/KL
0 – 200 kl / month	7.40
201 – 1 000 kl / month	7.30
1 001 – 2 500 kl / month	7.00
2 501 – 5 000 kl / month	6.90
5 001 – 2 5000 kl / month	6.70
25 001 – 50 000 kl / month	6.20
50 001 or more kl / month	6.15

In respect of each water connection provided to the premises on which a use as intended in this item, is being exercised, the relevant tariffs listed in this item shall be levied accumulatively.

3.5 Consumption by the Ekurhuleni Metropolitan Municipality owned properties, the following will apply:

- Properties used for Council business, the tariffs as listed in item shall apply;
- Properties used for residential purposes, the tariffs as listed in item 3.1 shall apply;
- Properties rented out, the applicable tariff in terms of the use of the property will apply.

3.6 Basic Charges

The tariff for basic charges is **R Nil**.

3.7 High Meter Readings

In case of exceptionally high meter readings of water consumption, due to bona fide leaks from a private internal pipeline, the Executive Director: Municipal Infrastructure, may determine that the excess consumption be levied at the levy Rand Water charges the Municipality (at that point in time, inclusive of the WRC levy), plus 15%

for a maximum period of three months, the commencement date of such period to be determined in the entire discretion of the said Executive Director. Proof of the leak being rectified in the form of a plumbers invoice and or reduction in consumption is required.

3.8 ERGO (for water supplied in terms of an existing agreement with the erstwhile Town Council of Springs) (Tariff Code WA 0023)

ERGO shall pay the following tariff: The cost payable to Rand Water by the Council plus 45.7% as administration charges.

3.9 Tariff payable by SAPPI for water supplied in terms of an agreement entered into on 18 October 1943 by the erstwhile Town Council of Springs (Tariff Code WA0024)

The cost as provided for in the agreement entered into on 18 October 1943: Rand Water Cost.

3.10 Sports Clubs with existing lease agreements with the Council (Tariff Code WA 0026)

The tariffs specified in the agreement shall apply until the expiry date of the relevant agreement. Thereafter, and unless amended, the tariffs listed in item 3.6 or specified in item 3.4.3, as the case may be, shall be payable.

3.11 Special tariff agreements / contracts with the Council

The tariffs specified per such agreement shall apply until the expiry date of the relevant agreement. Thereafter, and unless and until amended, the tariff(s) specified in the appropriate item contained in this schedule of tariffs shall be payable.

3.12 Water supplied to Johannesburg Water and other local authorities (Tariff Code WA0025)

The tariff(s) per kiloliter as determined in terms of the contracts, shall be payable.

3.13 Water supplied outside the Municipal Area at a tariff not listed in any other item of this schedule of tariffs (Tariff Code WA0027)

The tariffs payable shall be as set out in item 3.2 plus an administration fee of 10%.

3.14 Customer Audit

3.14.1 Where a customer Audit identifies residential and agricultural zoned properties used for business purposes, the adjustment to property tax and service charges from residential to business use will be effected from the date the audit was conducted.

3.14.2 The water consumption identified through a Customer Audit in respect of water meters not being incorporated in the Council's records will be calculated from the date the error was detected, providing a reading was obtained on such a date.

3.14.3 The City Manager in conjunction with the Executive Director: Municipal Infrastructure is authorized to adjust audited water meter factor errors for a maximum preceding period of three years at the applicable Rand Water cost per unit + 15% administration fee (Including WRC levy).

4. CONNECTION PIPES AND WATER CONNECTIONS OR UPGRADING OF UNAUTHORISED CONNECTIONS

Tariffs or charges payable in respect of the installation of connection pipes, water connections and fire hydrant connections:
(All tariffs exclude VAT).

4.1 Where a water or fire hydrant connection is supplied

(Note: Only combination meters are to be installed for connections larger than and including 80mm.)

4.1.1 Combination meters

MAIN METER SIZE	TARIFF
80mm	R14 200.00
100mm	R17 510.00
150mm	R28 100.00

4.1.2 Normal meters

Installation, including the connection into the reticulation pipeline, connection pipe to meter, stopcock, meter, meter box, with connecting pipe extending to boundary line and / or entrance to stand. (Including road crossing, if necessary):

METER CONNECTION	TARIFF
Domestic Connection	R1 900.00
25mm	R2 600.00
50mm	R8 300.00

Installation of water tap.

TAP SIZE	TARIFF
15mm – 25mm	R260.00

4.1.3 Where the normal water or fire hydrant connections mentioned in item 4.1 above (read with items 4.1.1 and 4.1.2) must be supplied within 14 days after approval of the application on special request, the tariff specified in item 4.1.1 and/or 4.1.2, as the case maybe, plus an additional amount of 15% of the relevant tariff(s) shall be payable.

4.2 Tariffs for charges payable in respect of the relocation of water meters

An owner of the premises will be charged for the relocation of a meter if the meter becomes inaccessible due to the installation of a fence or wall.

4.2.1 Relocation not further than 2 metres

METER SIZE	TARIFF
15mm	R500.00
20mm	R520.00
25mm	R640.00

4.2.2 Relocation further than 2 metres and up to 10 meters

METER SIZE	TARIFF
15mm	R740.00
20mm	R770.00
25mm	R890.00

4.2.3 Should any party require the installation of a stopcock to turn off the supply to a property, the charge for locating the stopcock, maintenance work in respect thereof or the replacement of the stopcock by the Council shall be as follows and shall be payable in advance by such party: R230.00 per event.

4.3 Tariffs for the installation of a second water meter

Installation of a second water meter in series with an existing water meter at the request of the owner of the premises.

METER SIZE	TARIFF
15mm	R885.00
25mm	R1 500.00

4.4 Special tariffs for government subsidized housing schemes

4.4.1 One connection pipe and water connection: Applicable tariff as per item 4.1.1 above.

4.4.2 2 to 20 connection pipes and water connections: Applicable tariffs as per items 4.1.1 and/or 4.1.2, as the case may be, per connection, less 10% discount.

4.4.3 21 to 50 connection pipes and water connections: Applicable tariffs as per items 4.1.1 and/or 4.1.2, as the case may be, per connection, less 20% discount.

4.4.4 51 or more connection pipes and water connections: Per quotation.

4.5 Temporary hydrant connections

4.5.1 Meter Deposits

SIZE OF METER FITTED: -	METER DEPOSIT
(a) 25mm connection	R2 500,00
(b) 50mm connection	R3 500,00

4.5.2 Consumption Deposits

SIZE OF METER FITTED: -	METER DEPOSIT
(a) 25mm connection	R 3 000,00
(b) 50mm connection	R 4 000,00

4.6 Temporary fitted builders connections

The tariffs below are applicable for builders only. The onus will be on the builder to inform Council that the construction is completed, and the connection is to be removed or transferred onto the owner's name.

4.6.1 Meter Deposits

SIZE OF METER FITTED: -	METER DEPOSIT
(a) 25mm connection	R2 500,00
(b) 50mm connection	R3 500,00

4.6.2 Consumption Deposits

SIZE OF METER FITTED: -	METER DEPOSIT
(a) 25mm connection	R 3 000,00
(b) 50mm connection	R 4 000,00

5. ILLEGAL CONNECTIONS AND OR CONSUMPTIONS AND DAMAGES TO SERVICES

- 5.1 Illegal use of the fire connection and/or use of unauthorised connections/ consumption: A fee of R5000 per unit representing water consumption and related administration costs.
- 5.2 Any damages to the network or connections: Actual cost of repairs + 15% administration fee per incident.
- 5.3 Neglect by an owner to repair a leaking fire connection within 48 hours after notification in terms of clause 8: Actual cost of repairs + 15% administration fee per incident.

6. CHARGES IN RESPECT OF SERVICES FOR WHICH NO TARIFFS ARE LISTED

In cases where a connection to or service in respect of the water system is required and for which a charge has not been listed above, the party applying for such connection or service shall pay the cost of such work plus an administration fee of 15%, such cost to be determined by the Executive Director: Municipal Infrastructure or his nominee in advance and such cost to be paid in advance.

7. INSPECTION FEES

- 7.1 In respect of a specific contravention of the Water Supply By-laws of the Council whether continuous or interrupted during a period of 12 months:

1 st inspection	No charge
1 st follow-up inspection subsequent to a notice of rectification	R 600,00
2 nd follow-up inspection subsequent to the notice of rectification intended above	R1 200,00
3 rd or subsequent follow-up inspection subsequent to the notice of rectification intended above	R3 000,00

- 7.2 In respect of locating Council meter chambers, private connections and acceptance by the Council of new water infrastructure, installations and connections during a period of 12 months:

1 st inspection on a site	No charge
1 st follow-up inspection on the site intended above	R 600, 00
2 nd follow-up inspection on the site intended above	R1 200,00
3 rd or subsequent follow-up inspection on the site intended above	R3 000,00

8. TESTING OF WATER METER

Tariffs payable by a party requesting the testing of a water meter for accuracy.

Replacement of meter and testing of the accuracy thereof by an accredited test bench.

SIZE OF METER	TARIFF
15mm	R310, 00
20mm	R310, 00
25mm	R375, 00
40mm	R400, 00
50mm	R825, 00
80mm	R880, 00
100mm	R1405, 00
150mm	R1465, 00

Note: In the event of a 20mm meter being removed from the site for testing purposes, it will be replaced with a 15mm meter.

9. READING OF METERS ON REQUEST

Should a person require that a meter be read at any time other than the time appointed by the Executive Director: Municipal Infrastructure or his nominee, a charge of R75, 00 shall be paid in advance for each such reading.

10. DISCONTINUATION AND RESTRICTION OF WATER SUPPLY AS CREDIT CONTROL MEASURE AND RE-INSTATEMENT OF SUPPLY

In the event of the water supply to a premises being cut off or restricted as a credit control measure, the consumer will be charged the following tariffs:

- 10.1 To deliver by hand at the premises being supplied with water, a notice addressed to the consumer instructing the consumer to settle the account within 14 days from the date of the notice: R30, 00.
- 10.2 To install a flow restrictor in order to restrict the flow through the connection to 30kl or less per month: R190, 00.
- 10.3 To disconnect the water supply by removing the connection pipe and / or T-piece or meter: R410, 00.

- 10.4 To remove the flow restrictor in order to re-instate full flow to the premises: R170, 00.
- 10.5 To re-connect the water supply where the connection pipe and /or T-piece or meter has been removed rates in 4.1.1 and 4.1.2 will be charged.

11. DISCONNECTION OF WATER SUPPLY AT THE OWNERS REQUEST

To disconnect the water supply by removing the connection pipe and meter:

SIZE OF METER	TARIFF
15mm	R250, 00
20mm	R250, 00
25mm	R300, 00
40mm	R400, 00
50mm	R700, 00
80mm	R750, 00
100mm	R1200, 00
150mm	R1300, 00

To re-connect the water supply where the connection pipe and /or T-piece or meter has been removed rates in 4.1.1 and 4.1.2 will be charged.

12. INCORRECT WATER ACCOUNT

In the event a miscalculation was made by the Council with the water charges rendered, on a Business account only, the rectified charges applicable shall be calculated as follows, upon approval by the Executive Director: Municipal Infrastructure:

The Charges applicable shall be the levy Rand Water charges the Municipality (at that point in time, including the WRC levy), + 15% levy, for the duration that the incorrect charges was rendered, up to a maximum of 36 months backdated.

13. DEPOSITS

- 13.1 The following deposits shall be applicable for all water connections, not listed in the table of 14.5. (The deposits are payable upon application of the connection. In the event an upgrade in connection is applied for, the deposit payable shall be the difference between the deposit already paid and the deposit applicable for that size connection):

SIZE OF METER	DEPOSIT
15mm	R300,00
20mm	R900,00
25mm	R900,00
40mm	R 2 000,00
50mm	R 2 000,00
80mm	R 5 000,00
100mm	R7 000,00
150mm	R8 700,00

- 13.2 The deposits in respect of Temporary Fire Hydrant Connections and Temporary Builders connection shall be those listed in 4.5.2 and 4.6.2 respectively.

- 13.3 In the case of defaulters, the deposit shall be calculated as the monetary value of the sum of the two highest consecutive consumptions, of the preceding 12 months of application of the service.
- 13.4 The deposit can be altered if the connection is upgraded or downgraded, retrospectively.
- 13.5 The following deposit to the amount of R50.00 shall be applicable for all residential water connections in the listed townships (The deposits will be levied on the account upon application for the connection and/or after signature of a user agreement) In the absence of an application and/or a signed user agreement, the registered owner/approved beneficiary will be regarded as the consumer of the services. The following deposit to the amount of R50.00 shall be applicable for all water connections in the listed townships (The deposits will be levied on the account upon application for the connection or after signature of a user agreement)

TOWNSHIP	REGION
Langaville Ext 6	East
Chris Hani Pr & Ext 1 & 2	East
Etwatwa Ext 30 and 31	East
Etwatwa Ext 32	East
Chief Albert Luthuli Ext 4	East
Etwatwa Ext 8,21 and 24	East
Etwatwa Ext 4,12,13 and 14	East
Kwa Thema Ext 3& 7 & Ekuthuleni	East
Tsakane Ext 19	East
Kwa Thema Ext 2	East
Kwa Thema Ext 6	East
Duduza Ext 3	East
TOWNSHIP	REGION
Daveyton Ext 12	East
Tsakane Ext 11	East
Tsakane Ext 5	East
Mayfield Ext 6	East
Mayfield Ext 7	East
Mayfield Ext 8	East
Etwatwa Ext 36	East
Etwatwa Ext 9 & 10	East
Geluksdal Ext 3	East
Chief Albert Luthuli Ext 2	East
Tsakane Ext 8,9,12,13,15,16,17 & 18	East
Langaville Proper, Ext 1,2,3,4,5	East
Tswelopele Ext 6	North

Tswelopele Ext 5	North
Esselen Park Ext 1 and 2	North
Inxweni	North
Tswelopele Ext 8	North
Tembisa Ext 23,24	North
Isekelo	North
Palm Ridge Ext 1 to 8	South
Katlehong South	South
Moleleki Ext 2	South
Vosloorus Ext 20	South
Zonkizizwe Proper, Ext 1 and 2	South
Reiger Park Ext 5	South
Windmill Park Ext 9	South
Vosloorus Ext 24	South
Zonkizizwe Ext 3	South
Zonkizizwe Ext 6	South
Tinasonke Ext 3	South
Villa Liza Ext 2	South
Eden Park Ext 5	South
Eden Park Ext 4	South

The following shall be noted:

- (i) The Ekurhuleni Metropolitan Municipality shall have the right to refuse to sell water services to any customer who has unsettled debt with the Municipality.
- (ii) The figures quoted in this Schedule of Tariffs DO NOT INCLUDE Value Added Tax.
- (iii) These tariffs shall be read in conjunction with the By-laws for the Supply of Water Services published by the Ekurhuleni Metropolitan Municipality.

B. EKURHULENI METROPOLITAN MUNICIPALITY: SCHEDULE OF TARIFFS FOR RENDERING OF SEWAGE DISPOSAL SERVICES AND INCIDENTAL CHARGES

The amounts due for water services for the 2006-2007 financial year BE PAID on dates as indicated on accounts which will be rendered from 1 July 2006.

1. ALL TARIFFS LISTED BELOW OR TO BE CALCULATED IN TERMS OF THIS SCHEDULE OF TARIFFS EXCLUDE VAT.

2. WASTEWATER AND INDUSTRIAL EFFLUENT TARIFFS

Charges shall be levied in respect of each discharge point for sewage (as defined in the Wastewater By-laws of the Council) whether such discharge point is a drain or the Council's sewage disposal system. It is further noted that the tariffs effective to consumption as from 01 July 2006 and accounts as from those generated in July 2006 on a pro rata basis where applicable, will be levied.

3. DOMESTIC EFFLUENT TARIFFS

All references in item 3 hereof to volumes expressed in kilolitres shall mean the volume of water supplied by the Council to the relevant premises during the period for which the relevant municipal account is compiled.

All tariffs listed in items 3.1, 3.2, 3.4, 3.11, 3.12, 3.13 if not excluded in terms of the agreement, shall be applied accumulatively.

3.1 Household use

Except where the tariffs listed in items 3.3 below are applicable, the tariffs listed in this item shall be payable where water, used solely for household purposes, has been supplied. The property zoned "Z.A.R", "general residential "or" residential 1,2,3,4 or 5 (residential 5 – for residential purposes only") in terms of a town-planning scheme and which are used exclusively for that purpose, shall be applicable. In the case of hostels and old age homes, every 4 beds shall be deemed to be a residential unit. Any premises zoned "Residential 1" and which is used exclusively for residential purposes, is regarded as one residential unit.

- This tariff is only applicable for properties zoned as detailed in 3.1 above.
- In the event that a small business is run from a property zoned Residential as detailed above, **and** the connection size is either a 15mm or 20mm connection, the tariffs in the table below shall apply. Any connection which is greater than 20mm and the property is not exclusively used for residential use, shall be charged in the tariffs as detailed in 3.5 below.
- That an additional 3 kl free basic consumption be granted to all registered indigent account holders
- The additional 3 kl free basic consumption is only applicable to registered indigents, as defined in the Indigent Policy, where the registered indigent is:
 - The owner of the property
 - The occupant of the property concerned
 - Has no other independent occupants on the property concerned

TARIFF SUMMARY	TARIFF R/KL
Number of residential units x (0 – 6 kl / month)	R0,00
Number of residential units x (7 – 15 kl / month)	R3,73
Number of residential units x (16 – 30 kl / month)	R1.20
Number of residential units x (31 – 45 kl / month)	R1,15
Number of residential units x (46 – 60 kl / month)	R1.10
Number of residential units x (61 or more kl/month)	R0.20

In the case of hostels and old age homes, every 4 beds shall be deemed to be a residential unit. Any premises zoned “Residential 1” and which is used exclusively for residential purposes, is regarded as one residential unit.

3.2 Institutional Use (Tariff Code SE 0009)

State-assisted public schools, public hospitals, churches and welfare organisations having been registered by the National Department of Social Development or its predecessors.

The tariff payable in terms of this item is as follows:

TARIFF SUMMARY	TARIFF R/KL
Fixed Rate	R 3, 00

3.3 Informal Settlements (Tariff Code SE 0008)

TARIFF SUMMARY	TARIFF R/KL
This item is applicable in cases where stands and/or dwelling units are supplied with water by means of a standpipe (no stand connection available)	R0, 00

3.4 The tariffs listed in this item are payable in respect of all uses not listed in items 3.1, 3.2, 3.3, and 8.

These tariffs apply to e.g. the following uses: business, commercial, industrial, government, mining, private schools, crèches, sport clubs, private hostels, clinics. (Tariff Code SE0011)

TARIFF SUMMARY	TARIFF R/KL
0 – 200 kl / month	R3, 95
201 – 1 000 kl / month	R3, 15
1 001 – 2 500 kl / month	R1, 75
2 501 – 5 000 kl / month	R0, 80
5 001 – 25 000 kl / month	R0, 75
25 001 – 50 000 kl / month	R0, 70
50 001 or more kl / month	R0, 25

In respect of each sewer connection provided to the premises on which a use intended in this item is being exercised, the relevant tariffs listed in this item shall be levied accumulatively.

3.5 Basic Charges

The tariff for basic charges is **R Nil**.

3.6 High Water Meter Readings

In case of exceptionally high meter readings of water consumption, due to bona fide leaks from a private internal water pipeline, the Executive Director: Municipal Infrastructure, may determine that the following effluent tariff shall be levied as follows on the excess consumption for a maximum period of three months, the commencement date of such period to be determined in the entire discretion of the said Executive Director.

TARIFF SUMMARY	TARIFF R/KL
Fixed Rate	R1.10

3.7 Any premises where the Council does not supply water, but where the premises can be connected to the Council's sewage disposal system:

3.7.1 Residential / Domestic Uses (Tariff Code SE0025)

TARIFF SUMMARY	TARIFF R
Fixed Rate per month	R65.00

3.7.2 Institutional Uses (Tariff Code SE0026)

TARIFF SUMMARY	TARIFF R
Fixed Rate per month	R130.00

3.7.3 Informal Settlements (Tariff as per item 3.3)

3.7.4 Other Uses (Tariff Code SE0027)

TARIFF SUMMARY	TARIFF R
Fixed Rate per month	R450.00

3.8 Sports Clubs with existing lease agreements with the Council

The tariffs specified in the agreement shall apply until the expiry date of the relevant agreement. Thereafter, and unless amended, the tariffs listed in item 3.2 shall be payable.

3.9 Special tariff agreements / contracts with the Council

The tariffs specified per such agreement shall apply until the expiry date of the relevant agreement. Thereafter, and unless amended, the tariff(s) specified in the appropriate item contained in this schedule of tariffs shall be payable.

3.10 Service Rendered Outside the Municipal Area

3.10.1 Where water is supplied by the Council to the premises situated outside the municipality from which sewage is disposed into the sewage disposal system of the Council, the tariffs payable shall be as set out in item 3.2 plus an administration fee of 10%, unless a different tariff's or different tariffs are listed in this schedule for the relevant use in which event the latter tariff(s) plus an administration fee of 10% will apply.

- 3.10.2 Where water is not supplied by the Council to those premises situated outside the municipality and such premises dispose of sewage into the sewage disposal system of the Council, the tariffs payable shall be negotiated directly with the party concerned, by the Executive Director Municipal Infrastructure, plus an administration fee of 10% will apply.
- 3.11 In addition to any other tariffs payable in terms of this schedule of tariffs an amount of **R180, 00** per month shall be payable in respect of any discharge point discharging wastewater and /or industrial effluent into the Council's sewage disposal system through a grease, oil, silt or sand trap.
- 3.12 Discharge of certain effluent where an industrial discharge permit as intended in section 34 of the Council's Wastewater By-laws is required.
- 3.12.1 In cases where water is supplied and metered by the Council and such water is used exclusively in an industrial process for which a valid and applicable industrial effluent discharge permit has been issued in terms of section 34 of the Wastewater By-laws of the Council, the tariffs specified in item 3 hereof shall not apply. Where the permit referred to above has been issued the tariffs intended in item 8, as the case may be, will be payable from the first day of the month following the month in which the certificate is issued.
- 3.12.2 In cases where the quantity of water used in an industrial process, for which a permit as referred to in 3.14.1 hereof is required, cannot readily be determined or at reasonable cost be metered by the Council, the Executive Director: Municipal Infrastructure may, subsequent to receipt of a written application submitted to him and containing sufficient information for his purposes, in his entire discretion, estimate the average monthly consumption of water thus utilized and in such event the tariffs specified in item 3 shall apply to the balance of the monthly water consumption: Provided that such estimate as well as the application of the tariffs intended in item 3 hereof to the balance of the monthly water consumption, shall only be effective from the first day of the month following the month in which the paid estimate was made Where the permit referred to above has been issued the tariffs intended in item 8, as the case may be, will be payable from the first day of the month following the month in which the certificate is issued.
- 3.13 Discharge of certain effluent where no industrial effluent discharge permit as intended in section 3 of the Council's Wastewater By-laws is required.
- 3.13.1 In cases where:
- (i) The consumption of water supplied and metered by the Council exceed 150kl per month; and
 - (ii) Subsequent to receipt of a written application submitted to him, the Executive Director: Municipal Infrastructure has issued to the Chief Financial Officer of the Council, a certificate confirming that all such water is utilized exclusively for industrial/manufacturing purposes producing effluent which may be discharged into the sewer disposal system the Council without it being required to obtain permission as intended in section 34 of the Wastewater By-laws of the Council the tariffs specified in item 3 hereof shall not apply to the water thus consumed from the first day of the month following the month in which the certificate as foresaid was issued. Where the said certificate has not been issued, the tariffs specified in item 3 hereof shall be payable.

Where the certificate referred to above has been issued the tariffs intended in items 8.3.3 and 8.3.4, as the case may be, will be payable from the first day of the month following the month in which the certificate is issued.

3.13.2 In cases where:

- (i) The consumption of water supplied and metered by the council exceeds 150 kl per month; and
- (ii) Subsequent to receipt of a sufficiently detailed written application submitted to him, the Executive Director: Municipal Infrastructure has issued to the Chief Financial Officer of the Council, a certificate confirming that such water is mainly utilized for industrial/manufacturing purposes which produce effluent which may be discharge into the sewer disposal system of the Council without it being required to obtain permission as intended in section 34 of the Wastewater By-laws of the Council, the Executive Director: Municipal Infrastructure, may in his entire discretion, estimate the average monthly consumption of water utilized for the industrial/manufacturing purposes, and in such event the tariffs specified in item 3 shall apply to the balance of the monthly metered water consumption: Provided that such estimate as well as the application of the tariffs intended in item 3 hereof to the balance of the monthly water consumption, shall only be effective from the first day of the month following the month in which the said estimate was made.

Where the said certificate has not been issued, the tariffs specified in item 3 hereof shall be payable. Where the certificate referred to above has been issued the tariffs intended in items 8.3.3 and 8.3.4, as the case may be, will be payable from the first day of the month following the month in which the certificate is issued.

- 3.14 The initial application for the certificate as envisaged in item 3.15 or the estimate required in terms of item 3.14 shall be free of charge, and all subsequent applications, shall be accompanied by a non-refundable fee of **R300.00**.

4. SEWER CONNECTIONS OR UPGRADING OF UNAUTHORISED SEWER CONNECTIONS

- 4.1 Where a connection to the Council's sewage disposal system is to be installed, the following charge shall be levied and will be payable in advance: (The charge excludes VAT)

DESCRIPTION	AMOUNT
100mm diameter connection onto a 100mm or 150mm diameter pipe (no road crossing)	R3 400.00
150mm diameter connection onto a 150mm diameter pipe (no road crossing)	R3 990.00
100mm diameter connection requiring a road crossing, whether partial or whole	R7 880.00
150mm diameter connection requiring a road crossing, whether partial or whole	R9 500.00

- 4.2 Where connections are provided in lieu of a discontinued bucket system, vacuum tank service, ablution block, chemical toilets or such other facility as the Executive

Director: Municipal Infrastructure may determine, the charges listed in item 4.1 shall not be payable.

4.3 Special tariffs for subsidized housing schemes

4.3.1 One connection: Applicable tariff as per item 4.1 above.

4.3.2 2 to 20 connections: Applicable tariff as per items 4.1 as the case may be, per connection, less 10% discount.

4.3.3 20 to 50 connections: Applicable tariff as per items 4.1 as the case may be, per connection, less 20% discount.

4.3.4 51 or more connections: Per quotation.

4.4 Charges In Respect Of Services For Which No Tariffs Are Listed

In cases where a connection to or service in respect of the sewage disposal system is required and for which a charge has not been listed above, the party applying for such connection or service shall pay the cost of such work plus an administration fee of 15%, such cost to be determined by the Executive Director: Municipal Infrastructure or his nominee in advance.

5. OTHER SEWER CHARGES

6. INSPECTION FEES

6.1 In respect of a specific contravention of the Wastewater By-laws of the Council whether continuous or interrupted during a period of 12 months:

1 st inspection	No charge
1 st follow-up inspection subsequent to a notice of rectification	R 6 00,00
2 nd follow-up inspection subsequent to the notice of rectification intended above	R1200, 00
3 rd or subsequent follow-up inspection subsequent to the notice of rectification intended above	R3 000,00

6.2 In respect of locating Council manholes, private connections and acceptance by the Council of new sewer infrastructure, installations and connections during a period of 12 months:

1 st inspection on a site	No charge
1 st follow-up inspection on the site intended above	R 600, 00
2 nd follow-up inspection on the site intended above	R1200, 00
3 rd or subsequent follow-up inspection on the site intended above	R3 000,00

7. READING OF EFFLUENT METERS ON REQUEST

Should any party require that a meter be read at any time other than the time appointed by the Executive Director: Municipal Infrastructure or his nominee, a charge of R120, 00 shall be paid for each such reading.

8. INDUSTRIAL EFFLUENT

8.1 Industrial Effluent Discharge Permit (Section 34 of the Wastewater By-laws of the Council)

No charge.

8.2 In respect of industrial effluent, the highest of the tariffs calculated in terms of item 8.3.2 or specified in items 8.3.3 or 8.3.4 shall be payable.

8.3 Industrial Effluent Treatment and conveyance charge

8.3.1 Calculation of Industrial Effluent Treatment and conveyance charge

The following provisions apply with regard to and for purposes of calculating the treatment and conveyance charge provided for in paragraph 8.3.2:

- (a) In addition to any other charges provided for in these tariffs or in any other law, a charge calculated in accordance with the provisions of these tariffs shall be payable to the Council in respect of each month during which industrial effluent is discharged from any premises.
- (b) Each user of the Council's sewerage disposal system (hereinafter referred to as "the said user") discharging effluent into such system shall test such industrial effluent, on a regular schedule as provided for in the permit to discharge industrial effluent, and report the results to the Council.
- (c) The Council shall in its entire discretion conduct analysis of industrial effluent at random. The values obtained by the Council shall be taken as correct and used to calculate the treatment and conveyance charge. Whenever the Council takes a sample, one half thereof shall be made available to the said user, if required at the time when the sample is taken.
- (d) The average of the values of the different analysis results of 24 hourly composite or grab samples of the effluent, taken during the relevant month and as prescribed in terms of the permit referred to in subparagraph (b) above will be used to determine the treatment charge payable.

Should the said user not accept the values obtained from the said analysis intended in this sub-paragraph the said user may request further tests at the cost of the said user to be done by a laboratory acceptable to the Council and the said user.

- (e) In the total absence of a sample, the said user shall pay to the Council the higher of the amounts as determined per items 8.3.3 or 8.3.4 hereof per month plus such other applicable tariffs prescribed herein.
- (f) Should the said user fail to submit to the Council timeously the results required in terms of subparagraph (b) above, the results obtained by the Council from the last test results submitted in terms of the provisions of subparagraph (b) shall remain applicable: Provided further that the Council may apply the provisions of subparagraph (c) above for the purposes of calculating the charges payable: Provided further that should the result of the

formula in item 8.3.2 be less than the amount specified in items 8.3.3 or 8.3.4 the highest amount calculated will be payable for the relevant month.

- (g) In the absence of any direct measurement, the quantity of industrial effluent discharged during a period shall be determined by the Council taking into consideration the quantity of water consumed on the premises during that period, the quantity of the water consumed on the premises for domestic purposes, the quantity lost to the atmosphere during the process of manufacture and the quantity present in the final product produced on the premises.
- (h) If a meter metering the quantity of water consumed on the premises is proven to be defective, the appropriate adjustments shall be made to the quantity of effluent discharged when calculated as prescribed in subparagraph (g) and the defective meter shall be repaired or replaced as soon as possible.
- (i) For the purpose of calculation of the quantity of effluent discharged from each point of discharge of effluent as aforesaid, the total quantity of water consumed on the premises shall be allocated among the several points of discharge as accurately as is reasonably practical after consultation between the Council and the said users of the relevant premises.
- (j) The owner or occupier of premises where an effluent meter is installed shall ensure that the meter is calibrated annually.

8.3.2 Treatment and conveyance charge

In addition to any other fee or charges payable in terms of this schedule of tariffs, there shall be payable to the council, in respect of any premises on which any trade or industry is carried out and from which, as a result of such trade or industry or of any process incidental thereto, any effluent (hereinafter referred to as "industrial effluent") is discharged into the council's sewage disposal system, a treatment and conveyance charge, being an amount calculated on the industrial effluent discharged, the strengths and the permitted (allowed) concentrations of the industrial effluent discharged during the relevant month and in accordance with the following formula:-

$$T_i = \frac{C}{12} \left(\frac{Q_i}{Q_t} \right) \left[a + b \left(\frac{COD_i}{COD_t} \right) + d \left(\frac{P_i}{P_t} \right) + e \left(\frac{N_i}{N_t} \right) + f \left(\frac{SS_i}{SS_t} \right) \right]$$

Where:

- T_i = Charges due per month for the treatment and conveyance of industrial effluent.
- C = R198 670 500
- Q_i = sewage flow (as defined in the Council's Wastewater by-laws) originating from the relevant premises in kilolitres per day determined for the relevant month;
- Q_t = annual total sewage inflow (as defined in the Council's Wastewater By-laws) to the Council's sewage disposal system in kilolitre per day;
- COD_i = average chemical oxygen demand of the settled sample originating from the relevant premises in milligrams per litre determined for the relevant month;

COD_t = annual average chemical oxygen demand of the settled sewage in the total inflow to the Council's sewage disposal system in milligrams per litre;

P_i = average Ortho-phosphate concentration originating from the relevant premises in milligrams phosphorus per litre determined for the relevant month;

P_t = annual average ortho-phosphate concentration of the sewage in the total inflow to the Council's sewage disposal system in milligrams phosphorus per litre;

N_i = average ammonia concentration originating from the relevant premises in milligrams nitrogen per litre determined for the relevant month;

N_t = annual average ammonia concentration of the sewage in the total inflow to the Council's sewage disposal system in milligrams nitrogen per litre;

SS_i = average suspended solids concentration originating from the relevant premises in milligrams per litre determined for the relevant month;

SS_t = annual average suspended solids concentration of the sewage in the total inflow to the Council's sewage disposal system in milligrams per litre;

a = portion of the fixed cost of treatment and conveyance;

b = portion of the costs directly related to the removal of chemical oxygen demand;

d = portion of costs directly related to the removal of phosphates;

e = portion of the costs directly related to the removal of ammonia;

f = portion of the costs directly related to the removal of suspended solids.

For calculating of the treatment charges according to the above formula the following system values will apply:

Q_t	466520
COD_t	592
P_t	5,6
N_t	25,6
SS_t	312
- a	0,79
- b	0,26
- d	0,16
- e	0,15
- f	0,14

8.3.3 Volume Charge

Where the discharging of effluent per volume per month as indicated in the table below occurs, the appropriate tariff set out in the table below shall be payable and the said appropriate tariff shall also apply where a certificate has been issued as intended in item 3.15 hereof.

VOLUME OF EFFLUENT DISCHARGED	TARIFF R/KL EFFLUENT
0 – 200 kl effluent / month	R3,80
201 – 1 000 kl effluent / month	R3,50
1 001 – 2 500 kl effluent / month	R3,20
2 501 – or more kl effluent / month	R1,75

8.3.4 Minimum charges: Effluent

R590, 00 per month

8.4 Additional Tariff Payable In Respect of the Discharge of Effluent having a Value Contrary to the Discharge Limits

8.4.1 The acceptable discharge limits are as specified in Schedule “A” hereof.

8.4.2 Where effluent contrary to the limits specified in Schedule “A” is discharged, treatment and conveyance charges being the higher of R0, 66 per kilolitre industrial effluent discharged during the relevant month or R650, 00 per month for each individual parameter deviating from the acceptable parameters specified in Schedule “A”, shall be payable to the Council in addition to all other charges payable to the Council in terms of this schedule of tariffs.

9. **VACUUM TANK SERVICES**

All existing and new customers receiving or requiring a vacuum tank service will be required to register with the Council prior to any service being rendered, at the relevant Service Delivery Centre.

Where the Council, in its entire discretion, is willing to provide a vacuum tank service, the following charges shall be levied and payable: -

Note: In the event the quality of the effluent does not conform to the standards as determined in Section 8 above, the Council reserves to right not to collect the effluent, or impose a penalty for the non conforming quality of effluent. In the event a penalty is imposed, the amount will be to the sole discretion of the Executive Director (Municipal Infrastructure). In the event Council exercises its right not to collect the non conforming effluent, the user will be obliged to treat the effluent, so as to conform to the standards set out in Section 8, and all costs in this regard will be for the users account.

9.1 Domestic Sewerage (Tariff Code : SUVAC2)

In cases where the premises can, but is not connected to the Council’s sewage disposal system, in the case of domestic sewerage, and the existing sewerage reticulation is adjacent to the said erf.

The user of the vacuum tank service pays a charge of R630,00 per call out irrespective of the quantity of wastewater removed for that call out.

For the purposes of item 9 “Domestic Sewage” shall mean sewage removed from residential premises, as defined in 3.1 above, including agricultural holdings and farm portions (only if such holdings or farm portions are primarily used for residential purposes), sport fields and old age homes.

9.2 Other Sewerage (Tariff Code : SUVAC3)

In cases where the premises can, but is not connected to the Council’s sewage disposal system, in the case of the property zoned all other uses, excluding uses as defined in 3.1 above, and the existing sewerage reticulation is adjacent to the said erf.

The user of the vacuum tank service pays a charge of R960,00 per call out irrespective of the quantity of wastewater removed for that call out.

In cases where the premises **cannot** be connected to the sewer disposal system (where the existing sewer reticulation is not adjacent to the said erf):

9.3 Domestic Sewage (Tariff Code : SUVAC4)

A charge of R150.00 per callout (max of 5kl), thereafter R150.00 per trip .

For the purposes of item 9 “Domestic Sewage” shall mean sewage removed from residential premises, as defined in 3.1 above, including agricultural holdings and farm portions (only if such holdings or farm portions are primarily used for residential purposes), sport fields and old age homes.

9.4 Other Sewage (Tariff Code :SUVAC5)

In the case of the property zoned all other uses, excluding uses as defined in 3.1 above, and the existing sewerage reticulation is not adjacent to the said erf.

A charge of R325 per callout (max of 5kl), thereafter R325 per trip.

10. **DISCHARGING OF WASTEWATER INTO RETICULATION BY A PRIVATE CONTRACTOR**

The contractor is required to enter into a license agreement, with a monthly fee of R1000,00 payable for permission to discharge into the mainlines and R75.00 for every discharge of 5kl made. The main lines will be identified by the Chief Area Engineer or his representative and only those may be used as the discharge point. Any deviation from the agreed point of discharge will result in a penalty of R2000.00 being levied, per incident. The company will be required to enter into a license agreement to discharge.

The Council reserves the right to take samples of the discharge at any time, and if the quality is deemed to be outside the standards as defined in Section 8 above, a penalty may be enforced, and the council reserves the right to terminate the contractor’s permission to discharge into the reticulation. The penalty in the event of non conforming quality of effluent discharged shall be to the sole discretion of the Executive Director: Municipal Infrastructure.

11. DISCHARGING OF WASTEWATER INTO RETICULATION BY COUNCIL APPOINTED ANNUAL CONTRACTOR

The contractor is required to enter into a license agreement, with a monthly fee of R1000,00 payable for permission to discharge into the mainlines. The main lines will be identified by the Chief Area Engineer or his representative and only those may be used as the discharge point. Any deviation from the agreed point of discharge will result in a penalty of R2000.00 being levied, per incident. The company will be required to enter into a license agreement to discharge.

12. SEWER CHARGES FOR TENANTS ACCOUNT

A Notice period of 12 months is hereby given, that as of the 1st July 2007, the sewer charges will be for the occupier's account, being the tenant or owner, whichever is applicable. Any changes required to be effected to the account, is to be submitted in writing by the owner, by no later than 1st February 2007, to the Finance Department. Occupier means in relation to any premises:

- The person in actual occupation thereof
- The person legally entitled to occupy the premises
- The person having the charge or management of the premises.

The following shall be noted:

- The Ekurhuleni Metropolitan Municipality shall have the right to refuse to sell water services to any customer who has unsettled debt with the Municipality.
- The figures quoted in this Schedule of Tariffs DO NOT INCLUDE Value Added Tax.
- These tariffs shall be read in conjunction with the By-laws for the Supply of Wastewater Services published by the Ekurhuleni Metropolitan Municipality.

APPENDIX B

LIST OF PROJECTS ON THREE YEAR *MULTI-YEAR BUDGET FOR WATER SERVICES*

Appendix B - List of projects on three year multi-year budget for Water Services

List of all Projects

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Replacement of midblock supply lines in Thokoza (counter funding)\	Alberton	-	700,000	500,000	1,200,000	Sewerage Purification & Reticulation	Sewerage
Upgrade of Voorpos Sewer outfall line between Natalspruit and Huntersfield area	Alberton	-	200,000	500,000	700,000	Sewerage Purification & Reticulation	Sewerage
Kingsway Sewer Pumpstation	Benoni	300,000	0	0	300,000	Sewerage Purification & Reticulation	Sewerage
Modderfontein 76 IR: Portion 32 bulk sanitation (C089 - counterfund))	Benoni	-	800,000	1,000,000	1,800,000	Sewerage Purification & Reticulation	Sewerage
Modderfontein 76 IR: Portion 32 bulk sanitation (C089)	Benoni	2,810,000	0	0	2,810,000	Sewerage Purification & Reticulation	Sewerage
Replace Apex sewer rising main (Phase 3)	Benoni	500,000	0	0	500,000	Sewerage Purification & Reticulation	Sewerage
Phasing out of Dunswart pump station (Outfall sewer) (counterfunding)	Benoni	3,000,000	3,000,000	4,000,000	10,000,000	Sewerage Purification & Reticulation	Sewerage
Phasing out of Dunswart pump station (Outfall sewer)	Benoni	100,000	1,000,000	2,000,000	3,100,000	Sewerage Purification & Reticulation	Sewerage
Upgrading of Benoni sewer pump station/s	Benoni	-	200,000	0	200,000	Sewerage Purification & Reticulation	Sewerage
Extension of Rynfield water and sewer network	Benoni	100,000	200,000	200,000	500,000	Sewerage Purification & Reticulation	Sewerage
Benoni Magoba Village sanitation-Phase 2 (counter funding)	Benoni	-	500,000	600,000	1,100,000	Sewerage Purification & Reticulation	Sewerage
Construct sewer pumpstation for the Bullfrog pan area	Benoni	-	0	330,000	330,000	Sewerage Purification & Reticulation	Sewerage
Relining of Sihoko Street sewer line	Benoni	-	0	200,000	200,000	Sewerage Purification & Reticulation	Sewerage
Eliminate Sunward Park sewer pump station	Boksburg	700,000	100,000	200,000	1,000,000	Sewerage Purification & Reticulation	Sewerage

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Upgrade and replace of sewerline between Brakpan av and Power str (Boksburg)	Boksburg	-	600,000	200,000	800,000	Sewerage Purification & Reticulation	Sewerage
Upgrade and replace of sewerline between Angelo and ReigerPark	Boksburg	200,000	200,000	200,000	600,000	Sewerage Purification & Reticulation	Sewerage
Lillianton Outfall sewer (H281)	Boksburg	1,000,000	1,870,000	1,000,000	3,870,000	Sewerage Purification & Reticulation	Sewerage
Main sewer link from Sunward Park Extension 19	Boksburg	50,000	0	0	50,000	Sewerage Purification & Reticulation	Sewerage
Main sewer link from Sunward Park Extension 20 and surrounding areas, including elimination of pump station	Boksburg	100,000	200,000	0	300,000	Sewerage Purification & Reticulation	Sewerage
Install main sewers in Bardene, block East of First str, West of Trichardts, South of Viewpoint	Boksburg	100,000	100,000	700,000	900,000	Sewerage Purification & Reticulation	Sewerage
Replace and repair of Dawn Park outfall sewer	Boksburg	-	500,000	400,000	900,000	Sewerage Purification & Reticulation	Sewerage
Installation of sewer mains and connections in Vosloorus	Boksburg	-	150,000	150,000	300,000	Sewerage Purification & Reticulation	Sewerage
Boksburg east Industrial Main Sewer (Tiger Brand Foods)	Boksburg	3,500,000	1,500,000	2,000,000	7,000,000	Sewerage Purification & Reticulation	Sewerage
Upgrading of sewer pumpstations in Casseldale, Daggafontein, Ou lokasie and Styx	Brakpan	200,000	300,000	300,000	800,000	Sewerage Purification & Reticulation	Sewerage
Provide sewer network Langaville x 7	Brakpan	-	0	0	0	Sewerage Purification & Reticulation	Sewerage
Sanitation project roll out (P2) MIG	Corporate	1,000,000	1,000,000	1,000,000	3,000,000	Sewerage Purification & Reticulation	Sewerage
Sanitation project roll out (Phase 2)	Corporate	-	0	0	0	Sewerage Purification & Reticulation	Sewerage
Water and sewer refunds	Corporate	50,000	50,000	50,000	150,000	Sewerage Purification & Reticulation	Sewerage
Provision of new outfall sewer to serve the Chris Hani Township	Daveyton	300,000	1,500,000	1,000,000	2,800,000	Sewerage Purification & Reticulation	Sewerage

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Upgrade Bedfordview sewer network	Edenvale	1,000,000	1,000,000	1,000,000	3,000,000	Sewerage Purification & Reticulation	Sewerage
Illiondale Outfall sewer	Edenvale	100,000	0	0	100,000	Sewerage Purification & Reticulation	Sewerage
Illiondale Outfall sewer (counter funding)	Edenvale	300,000	2,500,000	4,300,000	7,100,000	Sewerage Purification & Reticulation	Sewerage
Upgrading of Voorpos sewer outfall line between Natalspruit and Huntersfield area (Counterfunding)	Germiston	4,200,000	1,000,000	200,000	5,400,000	Sewerage Purification & Reticulation	Sewerage
Elsburg outfall sewer (H385) (Phase 2 and 3)	Germiston	2,400,000	500,000	0	2,900,000	Sewerage Purification & Reticulation	Sewerage
Elsburg outfall sewer (H385) (Phase 2 and 3 - counterfunding)	Germiston	-	200,000	200,000	400,000	Sewerage Purification & Reticulation	Sewerage
Upgrade and replace Dekema outfall sewer (More specific)	Germiston	-	300,000	2,000,000	2,300,000	Sewerage Purification & Reticulation	Sewerage
Elimination of Klippoortjie sewer pump station	Germiston	-	300,000	200,000	500,000	Sewerage Purification & Reticulation	Sewerage
Construct sand trap and splitter box at Crywagenpark Germiston	Germiston	50,000	0	0	50,000	Sewerage Purification & Reticulation	Sewerage
Upgrade sewer pump stations	Germiston	-	50,000	100,000	150,000	Sewerage Purification & Reticulation	Sewerage
Upgrade Magagulu Heights, Zonkizizwe sewer pumpstation in Katlehong	Germiston	200,000	200,000	200,000	600,000	Sewerage Purification & Reticulation	Sewerage
Construct access road to Magagula Heights sewer pumpstation	Germiston	-	280,000	0	280,000	Sewerage Purification & Reticulation	Sewerage
Upgrade/replacement of the link sewer between Delmore and Angelo connection into the Rondebult outfall sewer	Germiston	100,000	750,000	500,000	1,350,000	Sewerage Purification & Reticulation	Sewerage
Upgrade Tedstoneville koppies sewer to Dekema outfall sewer (Phase 1)	Germiston	100,000	765,000	500,000	1,365,000	Sewerage Purification & Reticulation	Sewerage
Replace Rondebult outfall sewer (H102)	Germiston	2,010,000	3,305,790	900,000	6,215,790	Sewerage Purification & Reticulation	Sewerage
Upgrading of Outfall Sewers in Vosloorus (H440)	Germiston	2,293,000	500,000	0	2,793,000	Sewerage Purification & Reticulation	Sewerage
Lillianto Outfall sewer. Eliminate existing sewer pumpstations in the area - saving to operational costs	Germiston	1,000,000	100,000	230,000	1,330,000	Sewerage Purification & Reticulation	Sewerage

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Bredell(High road) bulk sewer system	Kempton Park	-	0	0	0	Sewerage Purification & Reticulation	Sewerage
Phasing out of Blaauwpan sewer pumpstation	Kempton Park	100,000	100,000	500,000	700,000	Sewerage Purification & Reticulation	Sewerage
Phasing out of sewer pump stations	Kempton Park	-	250,000	0	250,000	Sewerage Purification & Reticulation	Sewerage
Water and Sewer Reticulation - Welgedacht Proper (Counter funding)	Springs	180,000	200,000	500,000	880,000	Sewerage Purification & Reticulation	Sewerage
Upgrading of sewer rising mains Grootvlei P/S, Zincor P/S, Daggafontein	Springs	100,000	500,000	620,000	1,220,000	Sewerage Purification & Reticulation	Sewerage
Water and Sewer Reticulation - Welgedacht Proper	Springs	200,000	1,000,000	1,450,000	2,650,000	Sewerage Purification & Reticulation	Sewerage
Upgrade the outfall sewer serving Sethoga Hostel which often overflows	Tembisa	1,000,000	-	-	1,000,000	Sewerage Purification & Reticulation	Sewerage
Replacement of Tembisa main outfall sewer at Teanong	Tembisa	1,596,000	0	0	1,596,000	Sewerage Purification & Reticulation	Sewerage
Upgrade of small bore sewers to 150mm dia pipe	Tembisa	-	200,000	500,000	700,000	Sewerage Purification & Reticulation	Sewerage
Upgrading of Outfall Sewers in Vosloorus (counterfunding)	Vosloorus	500,000	1,200,000	500,000	2,200,000	Sewerage Purification & Reticulation	Sewerage
Install new sewer pump station at Spruitview (more specific)	Germiston	50,000	0	0	50,000	Sewerage Purification reticulation	Sewerage
Upgrade Quinine road sewer	Kempton Park	300,000	300,000	0	600,000	Sewerage Purification reticulation	Sewerage
South Eastern Outfall Sewer - Springs	Springs	200,000	500,000	500,000	1,200,000	Sewerage Purification reticulation	Sewerage
Office Equipment (Corporate)	Boksburg	200,000	200,000	200,000	600,000	Office equipment	Water Distribution
Office Furniture (Corporate)	Boksburg	200,000	200,000	200,000	600,000	Office equipment	Water Distribution
ICT Equipment (Corporate)	Corporate	400,000	400,000	400,000	1,200,000	Office equipment	Water Distribution
Water Services Vehicles (Coporate)	Corporate	2,100,000	2,100,000	2,100,000	6,300,000	Other vehicles	Water Distribution

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Specialised vehicles (Corporate)	Corporate	800,000	800,000	800,000	2,400,000	Other vehicles	Water Distribution
Upgrade of the Brakpan depot	Brakpan	200,000	150,000	150,000	500,000	Other Land and Buildings	Water Distribution
Additions to standby quarters (Germiston)	Germiston	100,000	100,000	100,000	300,000	Other Land and Buildings	Water Distribution
Building of new and upgrading of Depots (Northern Region)	Kempton Park	200,000	0	0	200,000	Other Land and Buildings	Water Distribution
Upgrade and repair of Vosloorus 'depot' building	Vosloorus	1,000,000	800,000	580,000	2,380,000	Other Land and Buildings	Water Distribution
Construct new Daveyton depot	Benoni	-	0	0	0	Other Land and Buildings	Water Distribution
Specialized Equipment (Corporate)	Corporate	1,300,000	1,300,000	1,300,000	3,900,000	Plant equipment	Water Distribution
Network renewals / extensions (Alberton)	Alberton	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Upgrading: Installation of above ground fire hydrants in Katlehong	Alberton	-	600,000	400,000	1,000,000	Water Reservoirs & Reticulation	Water Distribution
Replace water connections and meters in Randhardt, Brackendowns, Mayberry Park, Generaal Alberts Park	Alberton	100,000	500,000	500,000	1,100,000	Water Reservoirs & Reticulation	Water Distribution
Lining of High pressure water mains in Alrode (Garfield road)	Alberton	1,500,000	200,000	0	1,700,000	Water Reservoirs & Reticulation	Water Distribution
Replace water meters and connections in Tokoza	Alberton	-	400,000	500,000	900,000	Water Reservoirs & Reticulation	Water Distribution
Construct water network Tokoza x 6	Alberton	-	260,000	280,000	540,000	Water Reservoirs & Reticulation	Water Distribution
Replacement of midblock supply lines in Thokoza	Alberton	1,200,000	0	0	1,200,000	Water Reservoirs & Reticulation	Water Distribution
Upgrade/replace reservoir telemetry equipment Palm Ridge supply zone	Alberton	-	200,000	500,000	700,000	Water Reservoirs & Reticulation	Water Distribution
Replace galvanized water connections: Northern parts of Thokoza - Penduka, Tintwa	Alberton	-	0	500,000	500,000	Water Reservoirs & Reticulation	Water Distribution
Benoni Magoba Village sanitation (CMIPH344) - Phase 1	Benoni	2,690,000	2,450,000	0	5,140,000	Water Reservoirs & Reticulation	Water Distribution

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Etwatwa X19 - Upgrading of Water Network	Benoni	3,210,000	6,500,000	3,000,000	12,710,000	Water Reservoirs & Reticulation	Water Distribution
Relining of Lakeside Mall outfall sewer Benoni	Benoni	5,000,000	5,000,000	500,000	10,500,000	Water Reservoirs & Reticulation	Water Distribution
Isolation of Midblock waterlines: Phase 8 (Where ???)	Benoni	-	500,000	500,000	1,000,000	Water Reservoirs & Reticulation	Water Distribution
Construct new water line for Actonville	Benoni	100,000	0	600,000	700,000	Water Reservoirs & Reticulation	Water Distribution
Putfontein 26 IR Ptn 106 bulk water Phse 6 (counterfunding)	Benoni	1,830,000	0	0	1,830,000	Water Reservoirs & Reticulation	Water Distribution
Construct main water ring in Etwatwa (Phase 3)	Benoni	2,300,000	1,000,000	300,000	3,600,000	Water Reservoirs & Reticulation	Water Distribution
Isolate midblock water lines in Daveyton (Phase 6)	Benoni	200,000	300,000	200,000	700,000	Water Reservoirs & Reticulation	Water Distribution
Putfontein 26 IR Ptn 106 bulk water Phse 6	Benoni	3,770,000	0	0	3,770,000	Water Reservoirs & Reticulation	Water Distribution
Complete water ring feed Modder East 72 IR Portion 1 (Phase 2)	Benoni	-	0	500,000	500,000	Water Reservoirs & Reticulation	Water Distribution
van Ryn water tower (C092) counterfunding	Benoni	2,000,000	825,000	0	2,825,000	Water Reservoirs & Reticulation	Water Distribution
Upgrading of water pump stations (Rynfield and van Ryn pump stations)	Benoni	200,000	0	0	200,000	Water Reservoirs & Reticulation	Water Distribution
Supply Line and Watertank - Steve Biko Informal Settlement (Ebumnadini)	Benoni	-	150,000	0	150,000	Water Reservoirs & Reticulation	Water Distribution
Rehabilitation of Etwatwa X9 Reservoir	Benoni	200,000	0	0	200,000	Water Reservoirs & Reticulation	Water Distribution
Booster Pump for Knoppiesfontein Reservoir	Benoni	-	200,000	200,000	400,000	Water Reservoirs & Reticulation	Water Distribution
Rehabilitation of 450dia steel pipe and Cathodic Protection - Eiselin Str	Benoni	200,000	200,000	400,000	800,000	Water Reservoirs & Reticulation	Water Distribution
Upgrading of 500dia waterpipe supplying Knoppiesfontein Reservoir	Benoni	300,000	0	0	300,000	Water Reservoirs & Reticulation	Water Distribution

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Rehabilitation of valves, hydrants and air release valves in Daveyton and Etwatwa	Benoni	-	300,000	0	300,000	Water Reservoirs & Reticulation	Water Distribution
Isolation of Midblock waterlines: Phase 4	Benoni	100,000	300,000	0	400,000	Water Reservoirs & Reticulation	Water Distribution
Isolation of Midblock waterlines: Phase 9	Benoni	-	0	0	0	Water Reservoirs & Reticulation	Water Distribution
Isolation of Midblock waterlines: Phase 10	Benoni	-	500,000	500,000	1,000,000	Water Reservoirs & Reticulation	Water Distribution
Installation of watermeters in Etwatwa X9 & 10	Benoni	150,000	0	0	150,000	Water Reservoirs & Reticulation	Water Distribution
Implement a valve and hydrant repair programme (Benoni)	Benoni	-	500,000	700,000	1,200,000	Water Reservoirs & Reticulation	Water Distribution
Network renewals / extensions (Daveyton)	Benoni	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Installation of standpipes and removal of water tanks Gabon, Barcelona, Magoba, Sam Ntuli	Benoni	2,000,000	0	0	2,000,000	Water Reservoirs & Reticulation	Water Distribution
van Ryn water tower (C092)	Benoni	100,000	0	0	100,000	Water Reservoirs & Reticulation	Water Distribution
Augment water bulk supply Rondebult MIG	Boksburg	3,160,000	0	0	3,160,000	Water Reservoirs & Reticulation	Water Distribution
Construct new water supply for Madeley supply zone (15th to Atlas road)	Boksburg	-	640,000	500,000	1,140,000	Water Reservoirs & Reticulation	Water Distribution
Network renewals / extensions (Boksburg)	Boksburg	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Repair joints on main water supply to CBD (Commissioner street)	Boksburg	-	0	0	0	Water Reservoirs & Reticulation	Water Distribution
Bulk supply for new developments from Dawn Park reservoir (Extend 400mm dia pipe)	Boksburg	-	200,000	1,000,000	1,200,000	Water Reservoirs & Reticulation	Water Distribution
Installation of water mains and appurtance in Vosloorus	Boksburg	-	150,000	150,000	300,000	Water Reservoirs & Reticulation	Water Distribution

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Extent the bulk water pipeline Villa Liza to Mapleton	Boksburg	506,000	100,000	400,000	1,006,000	Water Reservoirs & Reticulation	Water Distribution
Installation of new supply from Rand Water to Dawn park reservoir	Boksburg	2,850,000	1,000,000	0	3,850,000	Water Reservoirs & Reticulation	Water Distribution
Replace main water supply in Commissioner street	Boksburg	500,000	0	0	500,000	Water Reservoirs & Reticulation	Water Distribution
Construct new reservoir and pumpstation: Dalpark X13	Brakpan	-	210,000	200,000	410,000	Water Reservoirs & Reticulation	Water Distribution
Construct new reservoir and pumpstation: Middelweg Rand Collieries	Brakpan	210,000	200,000	500,000	910,000	Water Reservoirs & Reticulation	Water Distribution
Ring Connections Water Network in Brakpan CBD, Brakpan North, Brendhurst, Dalpark and exts	Brakpan	200,000	200,000	200,000	600,000	Water Reservoirs & Reticulation	Water Distribution
Installation of zone meters in Springs and Brakpan	Brakpan	-	100,000	500,000	600,000	Water Reservoirs & Reticulation	Water Distribution
Replace steel water leads under roads Strubenvale, Wright Park, Selection Park, Springs CBD and Casseldale	Brakpan	-	500,000	500,000	1,000,000	Water Reservoirs & Reticulation	Water Distribution
Provide water network Langaville x 7	Brakpan	-	0	0	0	Water Reservoirs & Reticulation	Water Distribution
Upgrade/Eliminate Rockville pumpstation	Brakpan	200,000	400,000	500,000	1,100,000	Water Reservoirs & Reticulation	Water Distribution
Network renewals / extensions (Brakpan)	Brakpan	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Isolation of water zones from high and low pressure zones	Corporate	538,000	0	0	538,000	Water Reservoirs & Reticulation	Water Distribution
Water Demand Management and Pressure Management	Corporate	-	500,000	1,500,000	2,000,000	Water Reservoirs & Reticulation	Water Distribution
Install combination meters in Industrial areas	Corporate	-	400,000	500,000	900,000	Water Reservoirs & Reticulation	Water Distribution
Installation of bulk meters	Corporate	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Replace isolating valves (and zone metering)	Corporate	200,000	100,000	200,000	500,000	Water Reservoirs & Reticulation	Water Distribution

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Provide emergency water supply - standpipes and sinkholes	Corporate	300,000	350,000	300,000	950,000	Water Reservoirs & Reticulation	Water Distribution
Provision of water to Informal Settlements	Corporate	-	0	0	0	Water Reservoirs & Reticulation	Water Distribution
Replace connection leads indigent properties	Corporate	-	0	100,000	100,000	Water Reservoirs & Reticulation	Water Distribution
Etwatwa x19-Upgrading of Water Network(counterfunding)	Daveyton	-	1,000,000	1,000,000	2,000,000	Water Reservoirs & Reticulation	Water Distribution
Daveyton ward 55 relocate midblock water lines	Daveyton	700,000	0	0	700,000	Water Reservoirs & Reticulation	Water Distribution
Network renewals / extensions (Edenvale)	Edenvale	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Upgrade bulk supply and water reticulation in Bedfordview	Edenvale	1,000,000	1,000,000	1,000,000	3,000,000	Water Reservoirs & Reticulation	Water Distribution
Upgrade waternetwork - Kloof street (Bedfordview)	Edenvale	400,000	0	0	400,000	Water Reservoirs & Reticulation	Water Distribution
Upgrade waternetwork - Van Buuren road (Bedfordview)	Edenvale	400,000	0	0	400,000	Water Reservoirs & Reticulation	Water Distribution
Augment water bulk supply to Roodekop housing development MIG	Germiston	-	200,000	0	200,000	Water Reservoirs & Reticulation	Water Distribution
Construct KAL bulk water for housing development	Germiston	-	0	0	0	Water Reservoirs & Reticulation	Water Distribution
Upgrade Tedstoneville koppies sewer to Dekema outfall sewer (Phase 2)	Germiston	-	500,000	500,000	1,000,000	Water Reservoirs & Reticulation	Water Distribution
Construct KAL bulk water for housing development (counterfund)	Germiston	-	0	0	0	Water Reservoirs & Reticulation	Water Distribution
Replace water pipelines in Germiston CBD area	Germiston	-	500,000	500,000	1,000,000	Water Reservoirs & Reticulation	Water Distribution
Network renewals / extensions (Germiston)	Germiston	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Germiston CBD Commissioning of existing water mains	Germiston	-	500,000	500,000	1,000,000	Water Reservoirs & Reticulation	Water Distribution
Separate of low pressures by rezoning within CBD	Germiston	-	300,000	300,000	600,000	Water Reservoirs & Reticulation	Water Distribution

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Transfer water pipelines from mid-block to street front in Primrose	Germiston	250,000	200,000	200,000	650,000	Water Reservoirs & Reticulation	Water Distribution
Augment water bulk supply to Roodekop housing development	Germiston	-	400,000	400,000	800,000	Water Reservoirs & Reticulation	Water Distribution
Augment water bulk supply to Rondebult (H133-counterfund)	Germiston	2,766,000	0	100,000	2,866,000	Water Reservoirs & Reticulation	Water Distribution
Augment water bulk supply to rondebult	Germiston	-	0	0	0	Water Reservoirs & Reticulation	Water Distribution
Upgrading installation of valve markers in Katlehong	Germiston	-	150,000	253,000	403,000	Water Reservoirs & Reticulation	Water Distribution
Kempton Park Klifontein 12 IR Portion 20 (H345)	Kempton Park	-	0	2,000,000	2,000,000	Water Reservoirs & Reticulation	Water Distribution
Bredell (High road) bulk water system	Kempton Park	-	0	0	0	Water Reservoirs & Reticulation	Water Distribution
Network renewals / extensions (Kempton Park)	Kempton Park	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Upgrading of water pumpstations at Zulu, Xhosa, Rhokan booster and Persida	Nigel	200,000	130,000	200,000	530,000	Water Reservoirs & Reticulation	Water Distribution
Network renewals / extensions (Nigel)	Nigel	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Dedicated water supply line to new Nigel prison (Eastern region) Council funds	Nigel	-	0	0	0	Water Reservoirs & Reticulation	Water Distribution
Replace water supply line to Marievale military base (Phase 1)- Eastern region	Nigel	1,000,000	400,000	0	1,400,000	Water Reservoirs & Reticulation	Water Distribution
Kwa-Thema: Upgrading of waternetwork (C025 - counterfund)	Springs	200,000	200,000	0	400,000	Water Reservoirs & Reticulation	Water Distribution
Upgrading water pumping main from Selcourt Pumpstation (D092 - counterfund)	Springs	200,000	500,000	1,800,000	2,500,000	Water Reservoirs & Reticulation	Water Distribution
Isolate Midblock water lines in Kwa-Thema	Springs	200,000	200,000	500,000	900,000	Water Reservoirs & Reticulation	Water Distribution

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Replace Water Network: Grootvaly Small Holdings	Springs	-	500,000	500,000	1,000,000	Water Reservoirs & Reticulation	Water Distribution
Kwa-thema:Upgrading of waternetwork(C025)	Springs	1,430,000	0	0	1,430,000	Water Reservoirs & Reticulation	Water Distribution
Install bulk meters & prvs Tembisa	Tembisa	2,591,000	100,000	0	2,691,000	Water Reservoirs & Reticulation	Water Distribution
Relining of reservoir feed for Tembisa reservoir	Tembisa	1,000,000	1,000,000	0	2,000,000	Water Reservoirs & Reticulation	Water Distribution
Relocate midblock water pipelines and install meters (Phomolong)	Tembisa	1,750,000	1,750,000	0	3,500,000	Water Reservoirs & Reticulation	Water Distribution
Tembisa Water Demand Management and Pressure Management	Tembisa	-	200,000	200,000	400,000	Water Reservoirs & Reticulation	Water Distribution
Relocate midblock water pipelines and install meters (counterfunding) - Phomolong	Tembisa	700,000	800,000	500,000	2,000,000	Water Reservoirs & Reticulation	Water Distribution
Relocate midblock water pipelines in Tembisa (H101 - counterfund)	Tembisa	368,000	0	0	368,000	Water Reservoirs & Reticulation	Water Distribution
Relining of reservoir feed for Tembisa reservoir (counterfunding)	Tembisa	1,593,000	1,000,000	200,000	2,793,000	Water Reservoirs & Reticulation	Water Distribution
Replacement of existing water line - Brian Mazibuko	Tembisa	200,000	0	800,000	1,000,000	Water Reservoirs & Reticulation	Water Distribution
Replacement of existing main water lines - Isekelo and Other Areas	Tembisa	-	100,000	800,000	900,000	Water Reservoirs & Reticulation	Water Distribution
Network renewals / extensions (Tembisa)	Tembisa	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Install Clayville ring feed and install zone meters	Tembisa	300,000	0	0	300,000	Water Reservoirs & Reticulation	Water Distribution
Install bulk metrs & PRVs Tembisa (counterfunding)	Tembisa	-	500,000	539,000	1,039,000	Water Reservoirs & Reticulation	Water Distribution
Upgrade reservoir feed for Olifants Reservoir	Tembisa	500,000	0	0	500,000	Water Reservoirs & Reticulation	Water Distribution
Tembisa relocate midblock water MIG funding	Tembisa	3,192,000	1,000,000	100,000	4,292,000	Water Reservoirs & Reticulation	Water Distribution

Project Name	CCC	2006/2007	2007/2008	2008/2009	Project Total	Asset Sub-Type	GFS Sub-Class
Relocate midblock water pipes and meters in Vosloorus	Vosloorus	2,533,000	1,000,000	1,000,000	4,533,000	Water Reservoirs & Reticulation	Water Distribution
Indigent water leak repair in Vosloorus (Ongoing repairs to indigents as registered)	Vosloorus	-	0	0	0	Water Reservoirs & Reticulation	Water Distribution
Network renewals / extensions (Vosloorus)	Vosloorus	500,000	500,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Relocate midblock water pipes and meters in Vosloorus	Vosloorus	-	1,000,000	500,000	1,500,000	Water Reservoirs & Reticulation	Water Distribution
Upgrading of mains due to new developments in Zonkiziwe First avenue from 22nd to 12th new 250 mm dia	Vosloorus	300,000	300,000	0	600,000	Water Reservoirs & Reticulation	Water Distribution
Upgrade indigent water system	Vosloorus	-	100,000	0	100,000	Water Reservoirs & Reticulation	Water Distribution
Daveyton Ward 55 relocate midblock water lines (counterfunding)	Daveyton	660,000	0	0	660,000	Water Reservoirs reticulation	Water Distribution
Upgrading: Installation of LH closing valves in Katlehong	Germiston	-	400,000	500,000	900,000	Water Reservoirs & Reticulation	Water Storage
Upgrading: Installation of valves markers in Katlehong	Germiston	-	150,000	300,000	450,000	Water Reservoirs & Reticulation	Water Storage
New water pressure tower / pumpstation for Tembisa reservoir	Tembisa	2,102,000	0	0	2,102,000	Water Reservoirs & Reticulation	Water Storage
New water pressure tower / pumpstation for Tembisa reservoir (counterfunding)	Tembisa	1,365,000	800,000	568,000	2,733,000	Water Reservoirs & Reticulation	Water Storage
Budget Totals		107,703,000	85,035,790	75,650,000	268,388,790		