

SPC 16/09/01
EXCO 41/09/01

WATER DEMAND MANAGEMENT POLICY

RESOLVED that the Water Demand Management Policy be adopted.

Extract from report is attached [\[go to next page/s\]](#).

Previous policy decision: -

File Ref. No. **(HO 27/1/3)**

Extract:

EXECUTIVE COMMITTEE

DRAFT: WATER DEMAND MANAGEMENT POLICY

(As edited by the Trading Services Portfolio Committee Workshop on 21-06-2001)

1. **PREAMBLE**

Three Acts govern the development of a water demand management policy. These are the Water Services Act (Act 108 of 1997), the Municipal Systems Act (Act 32 of 2000) and the National Water Act, 1998 (Act No. 36 of 1998).

The Water Services Act (Act 108 of 1997) requires a Water Services Authority to develop and implement a policy which complies with the Act. The Act provides the guidelines for the setting of such a Policy. This Draft Water Demand Management Policy has been developed to comply with the Act.

The Municipal Systems Act governs the basic provision of services and affordability, while the National Water Act concerns the environmental, catchment and riverine aspects.

The policy reflects the particular priorities established for Cape Town and takes into account the local conditions within which water services are delivered. The policy deals with both bulk and distribution aspects of water supply services.

Policy principles and objectives are set out in terms of the Legal and Regulatory contexts pertaining to the efficient use of water.

2 **DEFINITIONS**

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 households, including informal households, to support life and personal hygiene.
Consumer	Any end user who receives water services from a water services institution, including an end user in an informal settlement
Development plan	A water services development plan required in terms of the Water Services Act
Domestic water use	Water use that is used predominantly for domestic purposes, including garden irrigation.

Industrial use	The use of water for mining, manufacturing, generating electricity, land-based transport, construction or any related purpose.
Other water use	All water use not defined as domestic, industrial and commercial water use.
Person	Includes a water services institution
Water services authority	Any municipality, including a rural or district council responsible for ensuring access to water services
Water supply services	The abstraction, conveyance, treatment and distribution of potable water, water intended to be converted to potable water or water for commercial use but not water for industrial use.

3. LEGISLATIVE CONTEXT

Although a number of Acts of Parliament refer to aspects concerning the supply of water to all consumers, it is essentially the Water Services Act, Act 108 of 1997, (the Act) which provides the foundation for serious water conservation interventions.

The key elements of those Sections impacting on water conservation are:

Conditions for provision of water services;
 Industrial use of water;
 Norms and standards for tariffs;
 Duty to provide access to water services;
 Contents of draft water services development plan;
 By-laws;
 Procedure for making regulations;
 General powers of Minister;
 Delegation of powers;
 Offences.

The above Sections of the Water Services Act provide the mandate for water conservation and water demand management.

The most relevant Clauses of the above Act impacting on water conservation are extracted, in chronological order:

Clause 4 **Conditions for provision of water services.–**

- (1) Water services must be provided in terms of conditions set by the water services provider.
- (2) These conditions must–
- (b) accord with conditions for the provision of water services contained in bylaws made by the water services authority
- (c) provide for –
- (iv) the circumstances under which water services may be limited or discontinued;

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- (v) procedures for limiting or discontinuing water services; and
- (vi) measures to promote water conservation and demand management

Clause 7 Industrial use of water

- (4) No approval given by a water services authority under this section relieves anyone from complying with any other law relating to–
 - (a) the use and conservation of water and water resources;

Clause 10 Norms and standards for tariffs. –

- (1) The Minister may, with the concurrence of the Minister of Finance, from time to time prescribe norms and standards in respect of tariffs for water services.
- (2) These norms and standards may–
 - (d) provide for tariffs to be used to promote or achieve water conservation.

Clause 11 Duty to provide access to water services. –

- (1) Every water services authority has a duty to all consumers or potential consumers in its area of jurisdiction to progressively ensure efficient, affordable, economical and sustainable access to water services.
- (2) This duty is subject to–
 - (e) the duty to conserve water resources;
 - (g) the right of the relevant water authority to limit or discontinue the provision of water services if there is a failure to comply with reasonable conditions set for the provision of such services.

Clause 12 Contents of draft water services development plan. –Every draft water services development plan must contain details–

- (f) of existing and proposed water conservation, recycling and environmental protection measures.

Clause 21 Bylaws. –

- (1) Every water services authority must make bylaws which contain conditions for the provision of water services, and which must provide for at least–
 - (g) the prevention of unlawful connections to water services works and the unlawful or wasteful use of water.
- (2) The Minister may provide model bylaws to be used as a guide for water services authorities.

EXECUTIVE COMMITTEE**18-09-2001****Clause 71 Procedure for making regulations. –**

- (1) The Minister must, before making regulations under this Act–
 - (d) on request, report on the extent to which a specific comment or comments have been taken into account, or, if a comment was not taken into account, provide reasons therefore.

Clause 72 General powers of Minister. –

- (1) The minister may–
 - (j) prescribe measures to be taken by water services institutions to conserve water;

Clause 73 Delegation of powers. –

- (1) Subject to subsection (2), the Minister may in writing delegate any power vested in him or her by or under this Act.
- (2) The Minister may not delegate the power–
 - (a) to make regulations;
 - (e) to prescribe policy;

Clause 82 Offences. –

- (1) No person may–
 - (a) continue the wasteful use of water after having been called upon to stop by the Minister, a Province or any water services authority;

Clause 83 State bound by Act. –This Act binds the State and its organs.**4. THE CAPE TOWN SITUATION****4.1 SCARCITY OF WATER**

The Department of Water Affairs and Forestry has identified the Western Cape Region as the first major urban region where the demand for water will exceed total potential yield and this will occur around 2030 depending on the urgency with which water demand management interventions are introduced.

Historically, when water became scarce, a new dam impoundment was built. However, with the completion of the proposed Skuifraam Dam, the more suitable dam sites will have been developed.

Furthermore, the next augmentation scheme, probably also at a cost of close to R1 billion, will already have to be under construction before Skuifraam produces water (late 2006 or early 2007).

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4.2 GROWTH IN URBAN DEMAND

Statistics from the City Engineer's Annual Reports indicate that between 1960 and 1998, the demand for water has escalated at double the rate in population increase. This growth-rate is extraordinary and suggests that realistic savings of the order of 20 per cent (*i.e.* about 200 Mℓ/d) could be achieved if adequate resources were available to address the problem. Skuifraam Dam is estimated to cost R800 million and will yield around 200 Mℓ/d.

4.3 OPPORTUNITIES

Cape Town has historically answered any water shortage situation by selecting options to increase the water available to the system, but without proper consideration of the option of curbing the flow of water out of the system. While there has been significant progress in the last three years, many further opportunities should be explored and implemented.

4.4 WATER DEMAND MANAGEMENT STRATEGY

During 1997 the Cape Metropolitan Council accepted the following Policy Statement:

To develop and manage, in a participatory manner, the implementation of a socially beneficial, technically feasible, economically effective and ecologically sustainable water demand management strategy, which will reduce the (DWAF 1994) projected water demand in greater Cape Town by 10% (or more), by the year 2010.

In February 1998, the CMC established a Water Demand Management section to introduce initiatives to reduce the demand for water in the Cape Metropolitan Area.

With the view to achieving the above goal, one of the first tasks embarked upon by the new Section was to draft an appropriate **Strategy** and an accompanying **Programme** for implementation. This Strategy is currently in the process of being revised for acceptance by the Unicity.

The Strategy was supported by the creation of the Water Demand Management Assistance Programme (WADMAP) to assist MLC's with water conservation interventions. For 1998 the amount allocated was R2 million, rising to R10 million for 2000/2001.

5. LONG-TERM POLICY OBJECTIVES

It is crucial that the new City of Cape Town uses the current restructuring opportunity to draft a progressive new Water Demand Management Policy that will reflect the scarcity and precious nature of water in the Region. It is presumed that such a new policy will exceed the goals of the earlier policy.

The above considerations are important to address the long-term goals for the provision of potable water to Cape Town and to ensure the fundamental objectives below:

- * **Equity.** Universal access to quality water supplies, with a guaranteed minimum level of service, through a metered connection.
- * **Sustainability.** To ensure an acceptable level of assured water supply for future generations.
- * **Affordability.** To ensure that water services remain affordable.
- * **Reduce the projected demand for water by 20% (or more) by the year 2010.**

- * Encourage, educate, promote and where appropriate legislate the optimal use of water.
- * Maximise the use of alternative sources such as wastewater effluent, grey-water, rain water tanks, well-points and boreholes, etc.
- * Minimise the loss of water.
- * Ensure wise use of water by the municipality

6. LIMITATIONS

In view of the context outlined above, this water demand management policy has a number of limitations:

- * **Absence of an Integrated Development Plan.** This water demand management policy would form part of the Intergrated Water Development Plant in terms of the Water Services Act. This in turn forms part of the City's Integrated Development Plans and therefor needs to form a building block and integral part of the broader policy plans for city.
- * **Absence of a services delivery strategy.** The absence of an overall framework for service delivery in an integrated manner within the new City of Cape Town limits present draft policy.
- * While these limitations may influence the development of the policy, it is considered imperative that this process be commenced as a mater of urgency, given the looking risk of significant water shortages in this region.

7. POLICY PRINCIPLES

The following broad principles will inform the development of this policy and future implementation plans:

- * Water is a strategic, precious and scarce resource.
- * The waste of water shall not be tolerated.
- * All consumptive water use shall be measured and accounted for.

WATER DEMAND MANAGEMENT POLICY

GOVERNMENT NOTICE
DEPARTMENT OF WATER AFFAIRS AND FORESTRY

NO. 22355

8 June 2001

WATER SERVICES ACT, 1997

REGULATIONS RELATING TO COMPULSORY NATIONAL STANDARDS AND MEASURES
TO CONSERVE WATER

The Minister of Water Affairs and Forestry has under sections 9(1) and 73(1)(j) of the Water Services Act, 1997 (Act No. 108 of 1997), made the regulations in the Schedule.

SCHEDULE

DEFINITIONS

1. In these Regulations any word or expression to which a meaning has been assigned in the Act shall bear that meaning and, unless the context otherwise indicates –
- "effluent" means human excreta, domestic sludge, domestic waste-water, grey water or waste water resulting from the commercial or industrial use of water;
- "grey water" means waste water resulting from the use of water for domestic purposes, but does not include human excreta;
- "supply zone" means an area, determined by a water services institution, within which all the consumer connections are provided with water supply services from the same bulk supply;
- "the Act" means the Water Services Act, 1997 (Act No. 108 of 1997);
- "the National Water Act" means the National Water Act, 1998 (Act No. 36 of 1998);
- "user connection" means any connection through which a user can gain access to water services and includes any consumer installation and any bulk or communal connection.
- 'user sector' means the applicable category of users, being users categorised into at least either–
- (a) domestic;
 - (b) industrial; or
 - (c) commercial, sectors;
- "water efficient device" means any product that reduces the excessive use of water.

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BASIC SANITATION

2. The minimum standard for basic sanitation services is -
- (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.

BASIC WATER SUPPLY

3. The minimum standard for basic water supply services is –
- (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 or 6 kilolitres per household per month -
 - (i) at a minimum flow rate of not less than 10 litres per minute;
 - (ii) within 200 metres of a household; and
 - (iii) with an effectiveness such that no consumer is without a supply for more than seven full days in any year.

INTERRUPTION IN PROVISION OF WATER SERVICES

4. A water services institution must take steps to ensure that where the water services usually provided by or on behalf of that water services institution are interrupted for a period of more than 24 hours for reasons other than those contemplated in section 4 of the Act, a consumer has access to alternative water services comprising –
- (a) at least 10 litres of potable water per person per day; and
 - (b) sanitation services sufficient to protect health.

QUALITY OF POTABLE WATER

- 5.
- (1) Within two years of the promulgation of these Regulations, a water services authority must include a suitable programme for sampling the quality of potable water provided by it to consumers in its water services development plan.
 - (2) The water quality sampling programme contemplated in subregulation (1) must specify the points at which potable water provided to consumers will be sampled, the frequency of sampling and for which substances and determinants the water will be tested.
 - (3) A water services institution must compare the results obtained from the testing of the samples with SABS 241: Specifications for Drinking Water, or the South African Water Quality Guidelines published by the Department of Water Affairs and Forestry.
 - (4) Should the comparison of the results as contemplated in subregulation (3) indicate that the water supplied poses a health risk, the water services institution must inform the Director-General of the Department of Water Affairs and Forestry and the head of the relevant Provincial Department of Health and it must take steps to inform its consumers -

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- (a) that the quality of the water that it supplies poses a health risk;
- (b) of the reasons for the health risk;
- (c) of any precautions to be taken by the consumers; and
- (d) of the time frame, if any, within which it may be expected that water of a safe quality will be provided.

CONTROL OF OBJECTIONABLE SUBSTANCES

5. (1) A water services institution must take measures to prevent any substance other than uncontaminated storm water to enter -
- (a) any storm water drain; or
 - (b) any watercourse, except in accordance with the provisions of the National Water Act.
- (2) A water services institution must take measures to prevent storm water from entering its sewerage system.

DISPOSAL OF GREY WATER

7. A water services institution may impose limitations on the use of grey water if the use thereof may negatively affect health, the environment or available water resources.

USE OF EFFLUENT

8. (1) A water services institution must ensure that the use of effluent for any purpose does not pose a health risk before approving that use.
- (2) Any tap or point of access through which effluent or non-potable water can be accessed, must be clearly marked with a durable notice indicating that the effluent or non-potable water is not suitable for potable purposes.
- (3) A notice contemplated in subregulation (2) must be in more than one official language and must include the PV5 symbolic sign for non-potable water as described in SABS 1186: Symbolic Safety Signs: Part 1: Standards, Signs and General Requirements.

QUANTITY AND QUALITY OF INDUSTRIAL EFFLUENT DISCHARGED INTO A SEWERAGE SYSTEM

9. A water services institution is only obliged to accept the quantity and quality of industrial effluent or any other substance into a sewerage system that the sewage treatment plant linked to that system is capable of purifying or treating to ensure that any discharge to a water resource complies with any standard prescribed under the National Water Act.

WATER SERVICES AUDIT AS A COMPONENT IN THE WATER SERVICES DEVELOPMENT PLAN

10. A water services authority must include a water services audit in its annual report on the implementation of its water services development plan required in terms of section 18(1) of the Act.
- (2) A water services audit must contain details for the previous financial year and, if available, comparative figures for the preceding two financial years of –
- (a) the quantity of water services provided, including at least -
 - (i) the quantity of water used by each user sector;
 - (ii) the quantity of water provided to the water services institution by another water services institution;
 - (iii) the quantity of effluent received at sewage treatment plants; and
 - (iv) the quantity of effluent not discharged to sewage treatment plants and approved for use by the water services institution;
 - (b) the levels of services rendered, including at least -
 - (i) the number of user connections in each user sector;
 - (ii) the number of households provided with water through communal water services works;
 - (iii) the number of consumers connected to a water reticulation system where pressures rise above 900 kPa at the consumer connection;
 - (iv) the number of households provided with sanitation services through consumer installations connected to the sewerage system;
 - (v) the number of households with access to basic sanitation services;
 - (vi) the number of new water supply connections made; and
 - (vii) the number of new sanitation connections made;
 - (c) the numbers provided in compliance with paragraph (b) expressed as a percentage of the total number of connections or households;
 - (d) cost recovery, including at least -
 - (i) the tariff structures for each user sector;
 - (ii) the income collected expressed as a percentage of total costs for water services provided; and
 - (iii) unrecovered charges expressed as a percentage of total costs for water services provided;
 - (e) meter installation and meter testing, including at least –
 - (i) the number of new meters installed at consumer installations; and
 - (ii) the number of meters tested and the number of meters replaced expressed as a percentage of the total number of meters installed at consumer connections;
 - (f) the water quality sampling programme contemplated in regulation 5(1), the results of the comparison set out in regulation 5(3) and any occurrence reported in compliance with regulation 5(4); and

- (g) water conservation and demand management, including at least -
 - (i) the results of the water balance as set out in regulation 11;
 - (ii) the total quantity of water unaccounted for;
 - (iii) the demand management activities undertaken; and
 - (iv) the progress made in the installation of water efficient devices.

WATER AND EFFLUENT BALANCE ANALYSIS AND DETERMINATION OF WATER LOSSES

- 11. (1) Within two years of the promulgation of these Regulations, a water services institution must every month -
 - (a) measure the quantity of water provided to each supply zone within its supply area;
 - (b) determine the quantity of unaccounted for water by comparing the measured quantity of water provided to each supply zone with the total measured quantity of water provided to all user connections within that supply zone;
 - (c) measure the quantity of effluent received at each sewage treatment plant; and
 - (d) determine the quantity of water supplied but not discharged to sewage treatment plants by comparing the measured quantity of effluent received at all sewage treatment plants with the total measured quantity of water provided to all user connections.
- (2) A water services institution must -
 - (a) take steps to reduce the quantity of water unaccounted for; and
 - (b) keep record of the quantities of water measured and of the calculations made.

REPAIR OF LEAKS

- 12. A water services institution must repair any major, visible or reported leak in its water services system within 48 hours of becoming aware thereof.

MEASUREMENT OR CONTROL OF WATER SUPPLIED

- 13. (1) A water services institution must -
 - (a) within two years after promulgation of these Regulations, fit a suitable water volume measuring device or volume controlling device to all user connections provided with water supply services that are existing at the time of commencement of these Regulations; and
 - (b) fit a suitable water volume measuring device or volume controlling device to every user connection made after the commencement of these Regulations.

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- (2) If constructed or installed after promulgation of these Regulations, a suitable water volume measuring device or volume controlling device must be fitted to separately measure or control the water supply to every –
- (a) individual dwelling within a new sectional title development, group housing development or apartment building;
 - (b) individual building, having a maximum designed flow rate exceeding 60 litres per minute within any commercial or institutional complex; and
 - (c) irrigation system with a maximum designed flow rate exceeding 60 litres per minute that uses water supplied by a water services institution.
- (3) Where the water supplied is measured by way of a meter, that meter must comply with the Trade Metrology Act, 1973 (Act No. 77 of 1973), if of a size regulated under that Act.

CONSUMER INSTALLATIONS OTHER THAN METERS

14. Every consumer installation must comply with SABS 0252: Water Supply and Drainage for Buildings and SABS 0254: The Installation of Fixed Electric Storage Water Heating Systems, or any similar substituting re-enactment or amendment thereof if the consumer installation is of a type regulated by either standard.

PRESSURE IN RETICULATION SYSTEM

15. (1) A water services institution must design and maintain every water reticulation system installed after promulgation of these Regulations to operate below a maximum pressure of 900 kPa.
- (2) Where water pressure in a water reticulation system could rise above 900 kPa, a water services institution must install a pressure control device to prevent the pressure at any domestic consumer connection from rising above 900 kPa.

REPORTING OF NON-COMPLIANCE

16. A water services institution must have a consumer service to which non-compliance with these regulations can be reported.

Water restrictions were implemented on 1 November 2000 and are still in force. A R5.5 million awareness campaign was launched to promote the restrictions and keep the public informed of both progress and dam levels. Savings achieved are on target, reflecting the success of the awareness campaign.

A draft Water Demand Management Policy was presented to the Trading Services Portfolio Committee on 06-09-2001 and was further considered at a workshop held on 21-06-2001, at which the Committee made certain amendments. It was advertised for public comment and this closed on 02-08-2001. No comments were received. Contained in the Draft Policy are the following objectives;

- Equity. Universal access to quality water supplies, with a guaranteed minimum level of service, through a metered connection.
- Sustainability. To ensure an acceptable level of assured water supply for future generations.
- Affordability. To ensure that water services remain affordable.
- Reduce the projected demand for water by 20% (or more) by the year 2010.
- Encourage, educate, promote and where appropriate, legislate the optimal use of water.
- Maximise the use of alternative sources such as wastewater effluent, boreholes etc.
- Minimise the loss of water.

The Policy contained the following principles to inform the development of this policy and future implementation plans:

- Water is a strategic, precious and scarce resource.
- The waste of water shall not be tolerated.
- All consumptive water use shall be measured and accounted for.

3 INTEGRATED WATER RESOURCE PLANNING STUDY

Towards the end of 1999 the former Cape Metropolitan Council (CMC) also identified the need to adopt an integrated water resource planning approach to manage the future water demand in the Cape Metropolitan Area (CMA). In order to achieve this objective, the CMC appointed a consortium of Ninham Shand and Arcus Gibb in December 1999 to carry out an "Integrated Water Resource Planning" (IWRP) study. The aim of the IWRP Study was to investigate at pre-feasibility level various water demand management initiatives along with 3 water supply augmentation

schemes. The study would consider the technical, institutional, socio-economic, environmental and financial aspects of the options and make recommendations to the CMC on where to focus their resources and attentions with the aim of meeting and managing the water demand within the CMA.

The issue is not one of either you can build a dam or you can implement appropriate demand management interventions, but rather running a parallel approach. In such a “balanced approach” scenario, demand management optimizes the demand while at the same time essential resources are developed in order not to inhibit the economic growth of the region and to ensure a sustainable supply for the future.

The recommendations of the IWRP Study show that the implementation of initiatives known as Package 1 (i.e. Pressure Management, User Education, removal of Automatic Flushing Urinals, leakage repair and tariffs metering and credit control) and Package 2 (i.e. Private Boreholes, Water Efficient Fittings and the use of grey water) need to be accelerated in order to avoid more severe water restrictions being imposed by the City of Cape Town prior to the construction of Skuifraam Dam.

The more specific recommendations for all the options considered under Packages 1 and 2 are contained in Annexure “B” of this Report.

4 PURPOSE OF THE STRATEGY

This Water Demand Management Implementation Strategy is intended to ensure that the WDM Policy of the City is implemented effectively and efficiently leading to a saving of 20% or more of the projected consumption by 2010. It also serves to inform the Trading Services Portfolio Committee of Strategies proposed to achieve the desired level of water savings, some cost indications and possible time to fruition scenarios.

The strategy entails a high intensity programme for the next three years, after which a programme of ongoing maintenance and public education will be required. It is proposed that bi-annual reports on progress will be submitted to the Portfolio Committee for consideration. This monitoring role is particularly important, given the importance of the Strategy and the supporting role that is expected of the Committee.

A summary of the strategies is listed in Annexure “A”.

5. SPECIFIC STRATEGIES AND STRATEGIC OBJECTIVES

5.1- Identify Water Demand Management “Champions”.

The decision to reduce Cape Town’s projected water supply by 20 percent over the next few years will require strong leadership from the Trading Services Portfolio Committee where such decisions are taken. In order to demonstrate its commitment to such an objective, it is suggested that the Portfolio Committee will need to identify a number of “Champions” for WDM from within its own ranks. These Champions will

need to have the necessary passion and commitment to water conservation at heart. Specific roles need to be defined for these champions, such as assisting during Water Week, appearing at various functions, lobbying other departments to conserve water, and many others.

Strategic Objective 1. Identify “Champions” for Water Demand Management amongst Politicians and define their role of promoting WDM within the community and within the Municipality.

5.2- Raising the profile of Water Demand Management and clarifying roles of the managers within water.

The IWRP study highlighted the need to ensure that the proposed WDM measures are implemented as a matter of urgency. In order to achieve this, it is imperative that the management, co-ordination and monitoring of the WDM measures be given a significantly higher priority. As a key component of this strategy, it is proposed that each manager within the Water Services Cluster be given specific responsibilities in accordance with this strategy. The revised reporting lines will be addressed in the new structures that are developed as part of the city wide transformation.

Strategic Objective 2. Raise the profile and priority of WDM in the organization in order to achieve the objectives set out in the Policy and in this Strategy.

5.3- Prepare comprehensive Business Plans for specific WDM initiatives.

Each of the divisions within Water Services will prepare a business plan for that division’s responsibilities in this strategy. This will make certain that each of the initiatives is well planned, executed and reported on, thus ensuring a tightly managed progression of initiatives. The appropriate divisions within Water Services will be required to produce a business plan for each strategic objective in accordance with this strategy.

Strategic Objective 3. Prepare comprehensive Business Plans for each of the Water Divisions in respect of allocated Water Demand Management initiatives.

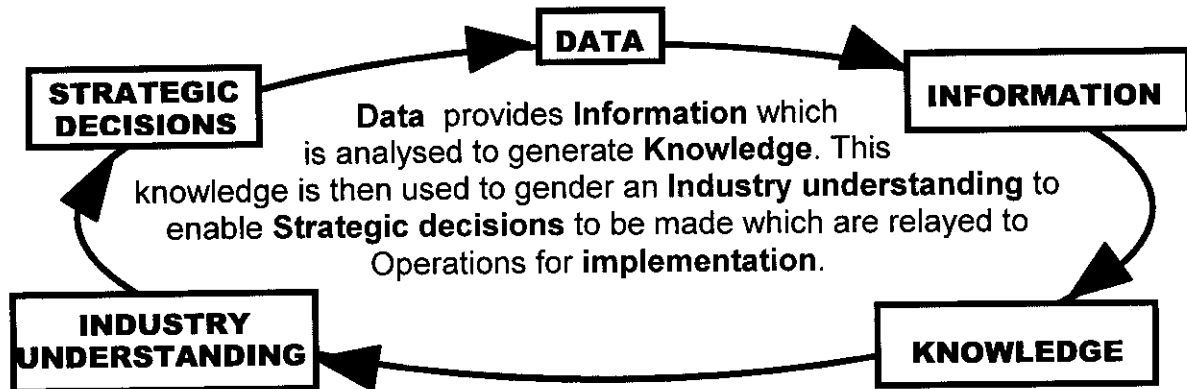
5.4- Bulk Meter Management for Accuracy

A bulk meter management system is required which will ensure the optimum accuracy of the large meters and the resultant income stream. This will include a testing and replacement programme.

The very cornerstone of water demand management is measurement. What is not measured cannot be managed effectively.

“TO MEASURE IS TO KNOW”

Any decision-making process commences with data. The better the data the better the decision.



Generally, water meters tend to ‘run slow’ as they age. This means that more water flows in to the system than the meter registers. When attempting to determine a water balance, (that is comparing the volume of water put into supply with the volume of water delivered to customers), any extra, unregistered, water will first have to be lost before any discrepancies are recorded.

A distinction is made between small domestic water meters and large, ‘bulk-water’, meters. A National Standard, SABS 0259 Parts 1, 2 and 5, covers the accuracy requirements of water meters with a nominal diameter of up to 100 mm. It is in the interest of the City to also maintain the accuracy of water meters not covered by SABS 0259.

A programme to improve large (bulk) water meter accuracy will be developed, comprising:

- Ψ List details of all existing meters by age or date of installation
- Ψ Draft a programme for replacement based on long-term asset management and best practice (sample testing) etc
- Ψ Thereafter, implement a meter replacement programme to ensure optimized accuracy and cost benefit.

Similar principles apply to all other meters such as district and revenue meters.

Strategic Objective 4. Implement a bulk meter management system to ensure accuracy of measurement.

5.5- Municipal policy on Wise Water Use

Municipalities need to lead by example. Excessive flushing times and volumes can be reduced, wasteful fittings should be adjusted, repaired or replaced and a responsible approach by municipal Parks and Forests departments to irrigating road medians, verges, parks and sports fields must be implemented.

To achieve the full potential savings, a Policy on water conservation will be developed to optimize water efficiency within the municipality to include buildings (rented and owned), Amenities and Parks and Forests Departments

A target date to complete the municipal Policy is December 2001.

Strategic Objective 5. Draft a municipal policy to ensure wise water use within the Municipality.

5.6- Water Services Bylaw

The previous transition to form the seven MLC's, brought together a number of individual local authorities, each with its own bylaws. After amalgamation, the Cape Town MLC republished its Bylaw (2 Feb 1996) which was also adopted by Tygerberg. Other MLC's, like South Peninsula, inherited up to five different bylaws from the local authorities that went to make up the new MLC

A new, consolidated Water Services Bylaw is proposed which will incorporate all the requirements of the Water Services Act, including water demand management. Some wasteful practices and devices, such as Automatic Flushing Urinals (AFUs), will be prohibited as wasteful use of water, which is an offence in terms of the Water Services Act. In this regard, the washing down of pavements and the washing of cars with hosepipes will have to be addressed.

Draft by-law ready by December 2001

Strategic Objective 6. Develop an appropriate Water Services Bylaw to legislate the optimal use of water, incorporating the essential water demand management requirements to limit the inefficient and wasteful use of water.

PACKAGE ONE

5.7- Leakage and Wastage Minimization through, inter alia, District Metering and Pressure Management

The SABS 0306: Code of Practice: Management of Potable water in Distribution Systems, describes a cascade approach to district metering such that the entire Region would be divided into suitably sized areas (Zones) of up to 2 000 service points.

Previously, the CMC: Bulk Water sold water to the six Administrations (MLC's) via a network of bulk revenue meters. With the new integrated approach, although these meters will no longer be required as 'revenue' meters, their role as water management meters is crucial for water balance purposes. To manage the supply of

water across the City, will require a specialist metering unit, or section, to log, read, manage analyse and maintain the network of strategic water management meters. The SABS Code of Practice categorises these existing meters as District and Sub-district meters.

Supplementary to the existing bulk water meters, between 700 and 1000 district metered areas (DMA's) will be required, of which roughly half would be more urgent than the others.

The costs vary according to size and equipment fitted and would be between R30 000 for smaller, simpler, installations to around R150 000 for large installations incorporating pressure management. Average figures might be around R40 000 per installation for reticulation Zones and R90 000 for the larger district and sub-district bulk meters.

Total costs might be $100 \times R90\ 000 = R\ 9\ 000\ 000$ for Districts/sub-districts, and $600 \times R40\ 000 = R24\ 000\ 000$ for distribution Zone meters.

Due to budget constraints and the size of this project, a process of prioritisation will determine where meters will be installed. Considerable time and manpower will be required to determine the current situation, to design and maintain the Demand Management areas.

A specialist unit or contractors will be required to obtain information on flow patterns by the introduction of a logging program. This information will advise Managers on actions to take to achieve water savings. Some strategic measuring points will be monitored by sophisticated telemetry systems.

Pressure management can be divided into ongoing pressure management and a permanent reduction of pressure for a specific area. All water networks are pressurised to ensure a required level of service. Water loss through leaks in the network or in private installations will be more where the pressure in network is high. Pressure management requires detailed investigations and analysis to ensure that the level of service is not affected. Reducing pressure is recognised as a significant water saving intervention even though it does not repair leaks. It is also seen as an action to reduce the risks of leaks to occur.

Intelligent or Smart Pressure Management which reduces the pressure in a network when water use is minimum has been implemented in certain areas. The success of a pilot project resulted in the implementation of one of the bigger projects in South Africa (Currently under construction in Khayelitsha).

It is important to note that pressure management is just another mechanism to reduce water loss and it is not the answer to all problems encountered in networks.

The Convenor: Water & Sewer Reticulation (Planning) will co-ordinate the planning of this strategy.

Strategic Objective 7. Leakage and waste minimization through the planning, design, construction, operation and monitoring of suitably located District Metering Areas and pressure management systems.

5.8- User education through Water Conservation Awareness Programmes and Projects

Education and awareness promotions are recognised as an important aspect to managing the demand for water. The R5,5m water restrictions awareness campaign, which achieved its objective of a 10% saving, needs to be analyzed in respect of the effectiveness of the various methods in order to maximize future funding of such campaigns. This awareness campaign recently won the Green Trust Award for water education campaigns. A schools unit will be built-up that will develop a programme and capacity to promote water awareness to all the 800 plus schools in the region.

A Joint 'Awareness Campaign Committee' comprising members from each Administration and other interested parties has been formed to manage events such as the highly successful National Water Week. The purpose is to develop all programmes on a Regional level, using professional people wherever possible.

For demonstrations at schools and elsewhere, various promotional materials have been produced. Promotions are planned by professionals and video visuals professionally produced. A substantial number of display and demonstration fittings and devices have been collected for use at local functions and events.

Consideration will be given to offering 'water audit' advice to property owners and managers (all user categories), to promote water savings as a service to our valued customers

Strategic objective 8. Promote the optimal use of water by consumers through education awareness programmes and projects.

5.9- The removal and prohibition of all Automatic Flushing Urinals (AFUs)

Some wasteful practices and devices should be prohibited as wasteful use of water, which is an offence in terms of the Water Services Act. In this regard, automatic flushing urinals have been referred to as "the ultimate water wasters". Although banned in terms of the current Cape Town Water Bylaws, automatic flushing urinals are still very prevalent, especially in older buildings and in Government institutional buildings such as schools, police stations, prisons, official residences, etc. About 70% of all the water passing through these water wasters passes through while the building is unoccupied. The removal of these wasteful devices is one of the short-term actions that can be taken to reduce water demand. They require very short lead times to replace, are immediately effective and are considered to be a 'quick fix' action. A recent report has estimated the number of AFU's still functioning in the City

area in excess of 5000, wasting as much as 2% of the total annual average daily water supply.

The prohibition of AFUs will be achieved through the new Water Services Bylaw.

Strategic objective 9. The removal and prohibition of all Automatic Flushing Urinals (AFUs)

5.10- Plumbing (leakage) repair projects (PRPs)

A balanced approach will be sought for householders to take responsibility for their water consumption.

Two major projects, Khayelitsha (Tygerberg) and Ikapa (Cape Town), have already been underway for three years or more. These projects are essentially short-term measures to limit the excessive losses occurring at the cost of the wider consumer body. The long-term solution should be that of universal metering and billing with appropriate credit control and customer management. The repair of private plumbing should ideally be the responsibility of the householder.

Each Administration will prepare a list of areas where such projects still need to be implemented, including manpower and budgetary requirements. An estimate of costs, water and financial savings, will be included. Some important aspects are:

- Ψ measures to ensure that degeneration does not occur,
- Ψ occupants of repaired houses undertake to pay for services, and
- Ψ ongoing repairs become the responsibility of the home-owner.

Strategic Objective 10. Minimize water losses in low-income housing through targeted plumbing repairs and education programmes.

5.11- Tariffs, metering and credit control

Although a rising block-rate tariff was first introduced into Cape Town in 1973, a common five step rising block-rate tariff came into effect in the Cape Metropolitan Area on 1 July 2001. In this tariff the supply of the first six kilolitres of water is zero rated for all metered domestic consumers. The Consumptive Water Tariff Policy was approved by Council in March and complies with the Draft Water Demand Management Policy.

Even in a perfect system there will be a discrepancy between the volume of water that is put into supply and the volume that is delivered to consumers. There are numerous reasons why all the water does not reach the consumers. The actual difference, loosely referred to as the Unaccounted For Water (UAW), varies widely from one Administration to another and between areas within an Administration.

The aim is to continuously reduce UAW through improving meter accuracy, fixing leaks and the elimination of book entry errors, meter reading errors and estimates, illegal and unmetered connections, etc. These are ongoing functions of any water supply authority. A major aim of this strategy is to improve confidence in the UAW figures and to prioritise tasks needing attention.

Universal metering of all consumers is a requirement of the Water Services Act and a Principle contained in the Draft WDM Policy Principles. A plan for the implementation of universal metering, indicating how it will happen, who will do it and what budget is available, will be developed. The Plan will include a programme to render accounts to all consumers and how customers will be encouraged to pay for their services.

Targets will be set for an annual decrease of the overall UAW figure. One KPI will be the ratio: Water purchased vs water billed to consumers. This ratio will be determined for each DMA and reported on.

Strategic Objective 11. Continually optimize tariff structures, ensure universal metering and billing and a rate of payment which makes financial viability certain.

5.12- Maximize the use of alternative sources of water

5.12.1 Alternatives for Consumers to consider:

Some areas within the Cape Metropolitan Area lend themselves to the exploitation of on-site alternative sources of water such as, use of 'grey-water", rainwater, well-points and boreholes.

Prohibitions and limitations exist on many such applications in many areas. For example rainwater tanks were outlawed in 1927 as they were often badly built, unsightly and created health hazards. The use of rain water for potable use is not normally permitted and interconnection between private and municipal systems is also not permitted.

An expert group will be assembled to revisit the many alternative options for harnessing alternative sources of water. The group will make recommendations on each option studied, stating the special conditions that should apply in each case.

Areas suitable for well-points/borehole exploitation will be mapped and consumers encouraged to make use of such resources.

5.12.2 Alternatives for Council to consider:

The City is currently disposing upwards of 500 Ml/day of treated sewage effluent into the rivers and ultimately the sea. Most Administrations do supply suitably treated effluents for irrigating facilities such as golf courses, sports fields and other recreational and landscaping uses. Much work still has to be done, however, a recommendation to achieve a zero effluent discharge during the summer months was accepted by the previous Water & Waste Committee.

Although many of the local springs dry up in summer, better utilization of springs can never the less be made, especially those that are in close proximity to storage facilities or customer properties. In-stream and estuarine needs will be taken into consideration.

Strategic Objective 12. Maximize the use of alternative sources of water.

5.13- Water Efficient Appliances

The onus to select water efficient fittings should not only rest with the consumer. Wasteful fittings are invariably cheaper and often have a similar esthetic appearance as water efficient fittings.

The control of fittings must be done Nationally. To achieve this aim it will be necessary to mobilize the development of National Performance Requirements by the SABS. The Head: Water will make representations, through the auspices of the Trading Services Portfolio Committee, to the SABS, to expedite a National Performance Standard for fittings, appliances and devices.

Once the national regulations are promulgated, they may be enforced through a number of measures.

The retrofitting of households needs to be investigated with a view to assisting the householder. Various rebate incentives are possible.

Strategic Objective 13. Make strong representations to the SABS to draft a National Performance Standard for water fittings, appliances and devices.

6. RESOURCES

The overall estimated budget for Packages One and Two as reflected in Annexure A is R107million. Only some R13m is available on the current year's budget. In order to achieve the savings required and minimize the risk of serious shortages, there will have to be a commitment to budgeting the required amounts in the next budget cycle. The business plans for each of the projects will reveal the more detailed budgetary requirements for the following two years.

7. CONCLUSION

The successful implementation of Water Demand Management requires considerable commitment from all the role-players involved. Engaging the public in this commitment represents the supreme challenge and in this regard, everyone needs to be involved.

This strategy will form part of the Water Services Development Plan which will be serving before the Portfolio Committee in November/December.

Authors:

C Chapman and the Water Services Interim Management Team

CITY OF CAPE TOWN – WATER DEMAND MANAGEMENT IMPLEMENTATION STRATEGY - SUMMARY				
10 September 2001				
STRATEGY ITEM	RESPONSIBLE	TOTAL BUDGET IWRP Study	CAPITAL BUDGET 2001/2002	OPERATING BUDGET 2001/2002
1. Identify high profile "Champions".	MWS	-		
2 Raising the profile of WDM * Assign specific responsibilities within Water Services * Policy & Strategy formulation and monitoring * WDM requirements in Water By Law * Mobilise donor funding	MWS WDM			R3 500 000
3 Business plans for each division responsibility	All			
4 Bulk Meter Management for Accuracy * Set up testing and replacement programme	BW	R600 000	R900 000	
5 Municipal policy on Wise Water Use * Ensure that all AFUs are removed * Ensure wise water use in Parks	WDM		R400 000	
6 Water Services By-law * WDM input into by-law	Retic (Plan) WDM			
PACKAGE ONE				
7. Leakage and Wastage minimization * Set up water auditing, data management & reports * Planning district metering & pressure manage't * Prioritise and install district meters * Set up leakage detection projects & programmes * Installation of PRV's and controllers * Monitor/analyse results	Retic (Plan) Retic (Ops)	R55 000 000	R4 000 000	
8. User Education in Water Conservation * Publicity research, planning and execution * Partnerships with schools, libraries, PAWC, etc. * Ongoing promotion of Water wise gardening * Formalise 'exhibition' collection * Establish an advisory 'Help Unit' * National Water Week	WDM & CARM	R5 000 000	R1 900 000	R2 250 000
9. Prohibit and remove Automatic Flushing Urinals * Prohibit through by-law * Remove all Automatic Flushing Urinals (AFU's)	WDM	R1 000 000	R750 000	
10. Plumbing (leakage) repair projects (PRP) * Plan & prioritise areas and budget funding * Fast track existing and new PRP's * Strategy to limit degeneration thro education, etc	Retic (Plan) Retic (Ops) & CARM	R45 000 000	R2 000 000	
11. Tariffs, metering and credit control * Universal metering and billing * Revisit commercial/industrial tariff structure * Set target consumptions city-wide * Meter testing and replacement programme	CARM Retic (Plan) Retic (Ops)	Ongoing	R2 000 000	
PACKAGE TWO				
12. Alternative sources of water * Mapping and assessment of all large irrigation and industrial needs on GIS * Matching needs with effluent availability a) Municipal control * Maximise wastewater reuse * Maximise use of local springs * Install parks boreholes b) Consumer control * Promotion of alternative sources with guidelines * Identify/map areas for well-points * Assist schools, parks and sports clubs * Grey Water SABS guidelines in preparation	WDM (CARM)	Ongoing	R600 000	
13. Water Efficient Fittings * Raise awareness of water saving devices * Setting standards (SABS) and training plumbers * Legislate efficient fittings in water by-law * Mobilise state & provincial departments to retrofit * Create programmes and incentives to retrofit	WDM	Ongoing	R450 000	
Budget Totals:		R106 600 000	R13 000 000	R5 750 000

Note: The budget figures are guidelines at this stage until the respective business plans are finalised.

Abbreviations: Manager Water Services (MWS), Bulk Water (BW), Water Demand Management (WDM), Reticulation - Water & Sewers – Operations (Retic (Ops)), Reticulation - Water & Sewers – Planning (Retic (Plan)), Customer and Revenue Management (CARM).

**SUMMARY OF WATER DEMAND MANAGEMENT RECOMMENDATIONS EMANATING OUT OF
THE "INTEGRATED WATER RESOURCE PLANNING" STUDY**

LEAKAGE AND WASTE MINIMISATION (PRESSURE MANAGEMENT)

The following recommendations are made with respect to Pressure Management:

1. Expedite the implementation of pressure management in areas already identified with a high potential saving.
2. Decide on the approach for the implementation of pressure management *i.e.* departmentally or by contract and to ensure that sufficient staff are available.
3. Prioritise the installation of District Metered Areas (DMAs).
4. Identify all potential areas to be logged in the future.
5. Implement a process to inform the communities of pressure management.

USER EDUCATION THROUGH WATER CONSERVATION AWARENESS PROGRAMMES AND PROJECTS

The following recommendations are made with respect to User Education:

1. Take care in the choice of words and general terminology used for the integrated user education and increased public awareness campaign (require positive slant and terminology).
2. Increase publicising of existing and new Water Demand Management (WDM) policies, municipal by-laws and regulations.
3. Train staff in-house and comply departmentally with regulations.
4. Lead by example in the implementation of the WDM options investigated in the Integrated Water Resource Planning Study and ensure that they comply with all existing regulations on water efficient use.
5. Identify a unique slogan and mascot for CCT's integrated WDM campaign
6. Identify local "champions" to publically promote CCT's WDM campaign.
7. Continue and expand the successful media campaign launched by the City to promote public education and water restrictions.
8. Consider the production of a video on WDM initiatives and means to achieve water efficient use.
9. Build on the current hospitality information packages aimed at efficient water use at households and non-residential organisations.
10. Expand the CCT/CMC Administration's existing website. The CCT's website address should be shown on monthly water bills of users.
11. Appoint publicity staff.
12. Establish an integrated consumer advisory service.
13. Target a specific month of the year (onset of summer) for participatory increased public awareness campaigns.

14. Promote water-wise gardening.
15. Take cognisance of all WDM measures when drafting bulk supply agreements with other Water Service Authorities.
16. Prohibit the hosing down of paved areas (this should be included in the proposed by-laws).
17. Continue and expand involvement of schools in the Cape Metropolitan Area (CMA) in water conservation.
18. Recommend initiation of liaison and co-ordination with South African Bureau of Standards (SABS) and the local plumbing industry, and manufactures and suppliers of water saving devices.
19. Increase co-ordination, possibly entailing lectures and workshops, with architects, quantity surveyors and building industries on water efficient fittings and water efficient use.
20. Approach the Department of Education and Public Works to actively participate in Water Demand Management Programmes.
21. Encourage the establishment of environmental training centres.
22. Encourage the training of community leaders.
23. Establish retrofitted of buildings on strategic locations in the CMA.
24. Utilise libraries for long term displays of information on water efficient use.
25. Incorporate WDM issues in the City wide newsletter.
26. Monitor continuously the impact of WDM, and give feedback on user education and public awareness campaign.

AUTOMATIC FLUSHING URINALS (AFU's)

The following recommendations are made with respect to AFU's:

1. Promulgate and implement consolidated municipal by-laws requiring all existing AFUs in the Cape Metropolitan Area (CMA) to be retrofitted within a period of two years. Furthermore, the installation of AFUs in new buildings is to be prohibited.
2. Encourage the replacement of AFUs prior to the expiry date of the two year period allowed in the proposed legislation.
3. Communicate the proposed by-laws as part of an integrated public awareness campaign on water demand management issues, providing info on the potential benefits to water consumers in terms of reduced water consumption and water bills should they replace AFUs. For the interim, encourage the switching off of AFUs during night times and over weekends when buildings are typically not occupied.
4. Liaise with national and provincial government departments, in particular the Department of Public Works and the Department of Education, to expedite the replacement of AFUs in government buildings and public schools.
5. Investigate the possibility of charging an interim tariff per AFU until replaced.

LEAKAGE REPAIR (Plumbing Repair Projects)

The following recommendations are made with respect to leakage repair/plumbing repair:

1. Expedite the implementation of a leakage/plumbing repair programme in areas already identified with high unaccounted-for-water (UAW).
2. Obtain detailed information on the UAW for all the zones within Tygerberg, Oostenberg, South Peninsula and Central Administration to identify zones with the highest potential for the implementation of plumbing repair programmes.
3. Decide on the approach for the implementation of leakage repair programmes *i.e.* departmentally or by contract and ensure that sufficient staff are available
4. Follow a comprehensive public education process in the area to inform on water wastage and procedures to be followed when household and reticulation leaks occur.
5. Implement a programme to ensure that a UAW of less than 15% is achieved per zone. Define zones for each area based on the present UAW, the number of public open spaces to be irrigated, *etc.* Depending on the geography and characteristics of an area, zones should follow SABS 0306 recommendations.

TARIFFS, METERING AND CREDIT CONTROL

The following recommendations are made with respect to tariffs, metering and credit control:

1. Consider increasing the number of steps in the residential water tariff. Additional steps will help facilitate income management.
2. Consider changing the existing flat tariffs for the commercial and industrial sectors, and other non-residential water uses, to alternative tariff structures to promote water demand management.
3. Continue monitoring price elasticities of users in the CMA.
4. Increase user education in respect of components of water tariffs.
5. Apply universal metering and billing.
6. Audit annually the metering, meter reading, and billing system to identify areas for improvement.
7. Apply verification, calibration and testing of all meters.
8. Institute a planned meter maintenance/replacement programme for all District Meter Areas and user meters.
9. Apply informative billing.
10. Improve credit control and debt management.
11. Consider restricting the water supply to non-paying users (this should be carried out in terms of the requirements of the Water Services Act).
12. Charge a re-connection fee.
13. Practice consistency in the application of credit control and water cut-off policies
14. Promote a culture of payment.

ALTERNATIVE SOURCES (USE OF BOREHOLES AND USE OF GREY WATER)

The following recommendations are made with respect to use of private boreholes:

1. Actively promote the use of private wellpoints and boreholes for the purpose of garden watering in the CMA.
2. Indicate where private wellpoints, boreholes or groundwater are used, the usage of which is to be indicated by a sign (eg. "Borehole water) to be clearly visible from the street. This should be included in any proposed by-laws.
3. The CCT should develop promotional material based on groundwater surveys.

The following recommendations are made with respect to the promoting of grey water use. No definite health regulations or water quality guidelines for gardening water exist in South Africa. However, there is a current SABS project in progress to produce a Code of Practice for Grey-water Usage (SABS 0323 : 200X).

1. Make representations to the relevant authorities to ensure that these issues are dealt with in a conservative way and in accordance with international practices.
2. Withhold the active promotion of grey-water use until the SABS standard is published.

WATER EFFICIENT FITTINGS

The following recommendations are made with respect to water efficient fittings:

1. Increase public awareness of the availability of water saving devices for retrofitting and new installations at private households and non-residential organisations.
2. Increase public awareness and availability of the DWAF publication titled "A to Z of Water Saving Devices", on performance standards for water efficient fittings issued by the DWAF's National Water Conservation Campaign.
3. Update the training course material used for the training of plumbers to include aspects related to retrofitting and new installations with water saving devices at private household and non-residential organisations (water conservation plumbers) as well as an overview of the pros and cons of alternative water saving devices.
4. Consider Municipal By-Laws to control all new installations of water fittings at residences and non-residential buildings.
5. Approach SABS to compile performance standards for water devices/fittings/appliances.
6. Approach (IDPSA) Institute of Plumbers to compile an information booklet aimed at maintenance managers and caretakers which contains guidelines on the planning of a regular and effective maintenance programme for plumbing fittings.
7. Establish an advice bureau to liaise with consumers. Maintain a direct enquiry line to cater for enquiries from the public.
8. Expand selected plumbing repair projects, which could include the retrofitting of toilets, taps and showerheads.
9. Lead by example and retrofit all Unicity owned premises and encourage retrofitting in rented premises.
10. Introduce a municipal by-law requiring flow controllers/aerators/sprays with flow rates not exceeding 5ℓ/min to be fitted to all basin taps (hand-wash basins) in all public facilities and non-residential buildings.

11. Liaise with national and provincial departments, particularly the Department of Public Works, to promote and advise on the implementation of retrofit programmes at government and local authority buildings in the CMA.
12. Use trained personnel on plumbing repair projects to install, as opposed to the mere distribution of, water saving devices from depots to private household. An opportunity should be afforded to select water saving devices, eg. showerheads, from a range of acceptable high efficiency low-flow showerheads to cater for personal preferences. Home owners would, however, be expected to pay the incremental costs associated with more expensive water saving devices.
13. Investigate the feasibility of implementing subsidised/retrofit schemes for private households.
14. Allow only products listed by the Joint Acceptance Scheme for Water Installation Components (JASWIC).
15. Consider the implementation of rebate programmes for water saving device aimed at both the private household, non-residential organisations and retailers/plumbing companies.

USE OF TREATED WASTEWATER FOR INDUSTRIAL USE

The following recommendations are made with respect to the use of treated wastewater for industrial use.

1. Undertake a detailed survey of all the industries, and consumers with irrigation potential, whereafter this option should be re-assessed.
2. Carry out a further study to assess the quality required by the industries and the quality produced at the wastewater treatment works.

WATER RESTRICTIONS

The following recommendation are made with respect to the water restrictions.

1. Consider the application of a separate water tariff, to be applied during times of water restrictions.
2. Ensure the continued equitable, fair and consistent application and monitoring of the existing water restrictions regulations.