

## **CURRENT WATER RESOURCE SITUATION AND THE IMPLEMENTATION OF WATER RESTRICTIONS (23/09/2004)**

*Issued by the City of Cape Town to inform its citizens on the implementation of water restrictions*

### **Background**

The Western Cape is a water scarce area and the low summer rainfall means that sufficient storage has to be provided to store surplus winter water to supply the consumers of Cape Town with water during the dry summer months

Water resources in the Western Cape are normally assessed at the end of the hydrological year, after the normal winter rainfall period (end October) and at the onset of the winter rainfall period (end May). The assessment is done by means of a sophisticated statistical computer model, jointly set up by the City of Cape Town and the Department Water Affairs and Forestry. The model assesses the total demand for water in the region *i.e.* urban and agriculture over a number of years against the expected inflow into the various dams during drought years at various risks of occurrence. On the basis of the planning model results an informed decision can be made on the need for water restrictions and the required severity thereof in order to avoid failure of supply for the next successive years.

The rainfall and associated runoff into the major dams supplying the Cape Metropolitan Area has been well below average this winter. In the catchment of the Wemmershoek Dam, 493 mm of rain has fallen this year compared to the long term average for the same period of 852 mm (approximately 58% of long term average).

### **Water Restrictions**

In order to prepare for the possibility of imposing water restrictions this coming summer a set of water restriction measures were formulated, to be used dependent on the degree of water restriction imposed.

A Level 1 restriction would apply if a curtailment in water demand in the vicinity of 10 % was required. Similarly a Level 2 and Level 3 restriction would be applied if the curtailment in water demand was in the vicinity of 20% and 30% respectively. The water restriction measures (Restriction Notices) which would have to be imposed for a Level 1,2 and 3 restriction and the associated water and sanitation tariff increases for all three levels of water restrictions were submitted to Council on the 25/08/2004 for consideration. Following a Council resolution to impose water restrictions from 1 October 2004, the Water Restriction Notices and associated water and sanitation tariff increases were advertised for public comment on the 26/08/2004.

The state (as at 20<sup>th</sup> September 2004) of the main dams supplying the Cape Metropolitan Area as compared to the five previous years is reflected in Table 1 below. Because of the various sizes of the dams the best indicator is the overall percentage stored compared to the total accumulated capacity. This is the statistic shown in the bottom line of Table 1.

**STORAGE LEVELS ON 20 Sept 1999 - 2004**

DAM	BULK STORAGE						
	CAPACITY MI	% 1999	% 2000	% 2001	% 2002	% 2003	% 2004
WEMMERSHOEK	58,644	100.0	77.0	100.2	99.0	64.6	59.4
STEENBRAS LOWER	33,517	98.8	88.3	99.7	87.0	86.2	72.9
STEENBRAS UPPER	31,767	101.3	101.8	100.1	99.2	99.6	91.6
VOELVLEI	164,122	89.7	68.3	98.7	99.2	73.3	54.9
THEEWATERSKLOOF	480,250	100.6	87.7	101.2	101.3	75.4	54.0
<b>TOTAL STORED</b>	768,300	754,444	640,170	771,678	767,936	581,044	437,710
<b>% STORAGE</b>		98.2	83.3	100.4	100.0	75.6	57.0

Table 1

The two biggest dams in the Western Cape Water System are the Theewaterskloof Dam (stores 63% of the total storage capacity of all the dams) and the Voelvllei Dam (stores approx. 21% of the total). Due to Theewaterskloof's big storage capacity, the water levels in Theewaterskloof Dam play a significant role in determining whether or not water restrictions would have to be imposed and the Level of the Water Restriction to be imposed. Theewaterskloof is currently only 53% full. It is also important to note that Theewaterskloof Dam was designed with surplus storage capacity in order to accommodate droughts similar to the one currently being experienced. The level of water restriction that would be imposed would be dependent on the total of the volume of water stored from all the major dams supplying the Cape Metropolitan Area with water.

Given the current gross storage of the major dams, the Department of Water Affairs and Forestry (DWAF) has informed the City of Cape Town that they have to limit their water usage from the major dams supplying the Cape Metropolitan Area by 20% (over a year) from 1 October 2004. The decision to limit water supply to the City was made by DWAF, after discussions with all water users from the Western Cape Water System as it was anticipated that the volume of water (% full) in the major dams supplying the Cape Metropolitan Area would fall between 54% and 69% by the end of October 2004. Figure 1 graphically depicts the decision making surrounding the imposition of the various restriction levels and tracks how the actual storage capacity in the major dams over the last two months has changed.

In order to achieve the saving in raw water required by DWAF, the City of Cape Town, after considering comments and objections received from the public, is imposing a Level 2 water restriction on its consumers from 1 October 2004. It is important to impose water restrictions on water users this coming summer in order to ensure the sustainable short to medium term utilization of the water resources of the Western Cape Water System.

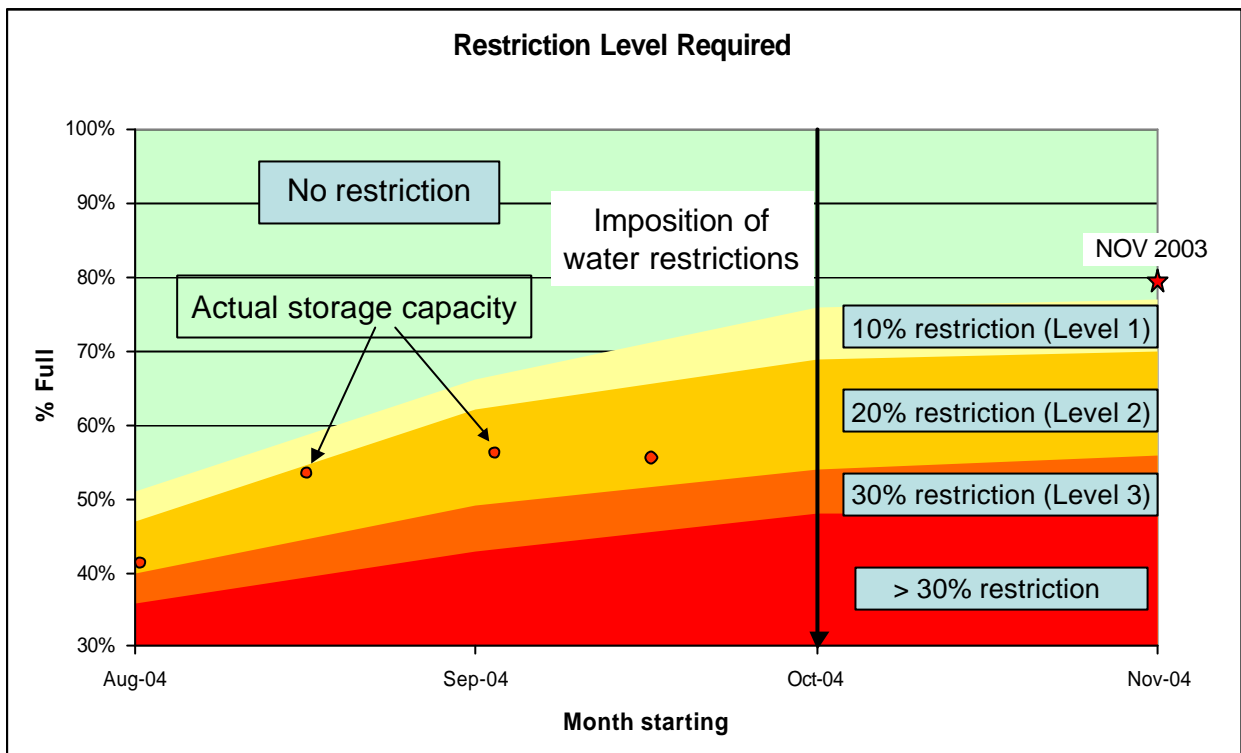


Fig 1

In terms of Council resolution C 20/08/04 “the Executive Mayor be authorised to take any further decision, perform any further power or duty in terms of Sections 2,3 and 4 of the *Water Services Bylaw To Limit or Restrict the Use of Water*”. In terms of this delegation, the Executive Mayor could modify or lift the water restrictions imposed should the restrictions imposed not be sufficiently effective in limiting water demand or should the degree of curtailment required (Level of Water Restriction) change as a result of late winter rainfall.

### Management of Dams

A comprehensive statistical analysis which includes 400 possible inflow scenarios into the dams in terms of rainfall and runoff was carried out to determine the probability of the major dams filling. One of the possible inflow scenarios is a drought exceeding the worst drought in history in the Western Cape. The analysis also includes projected long term water demands from both urban and agricultural users. Based on this analysis the levels in the dams are managed through the curtailment of water demand in order to ensure that the dams will not empty and will recover over time. A progressively severe water restriction may have to be imposed should the drought continue or should less rainfall occur in future years. The modeling carried out this year showed that a 20% level of water restriction would have to be imposed this coming summer in order to manage the recovery of the dams over the next 2 to 3 years.

## Water and Sanitation Tariff Increase for Water Restrictions

In terms of the Municipal Systems Act, Local Authorities must set tariffs that will ensure cost recovery. During a period of water restrictions there will be a reduction in revenue from water sales. Water tariffs need to be increased to recover the anticipated loss in revenue. The average % increase in the tariff is significantly higher than the % reduction in water consumption for two reasons, namely 1) the water that will be saved during the restriction period is anticipated to be water that would have been sold at tariffs higher than the average cost of water and 2) the loss in revenue must be recovered from a lower consumption base.

This is aggravated by the steeply rising block tariff structure for domestic consumers which has been designed to encourage water conservation and to ensure affordability for the poor. A large portion of the domestic water sold is sold at less than the average cost of water.

The principles of cost recovery, ensuring affordability and water conservation inform the tariff process.

The tariffs have taken into account the fact that consumers with already low water consumption will have less capacity to save than those with higher water consumption. The tariffs have been designed so that higher consumers will be expected to save more than lower consumers in order not to pay more than their present bill.

The table below shows the impact of 20% restrictions on a water user that consumes 25kl per month. Should water restrictions be imposed without a tariff increase, and the consumer used 20% less water, the City would under recover approx. R27 on each these consumers. With the tariff increases for a Level 2 water restriction, the City still under recovers by approx. R11 per 25 kl consumer. In order to ensure full overall cost recovery the City starts incrementally over recovering from consumptions in excess of 28 kl per month.

### Consumer using 25 kl of water per month

Consumption Block	Consumption Description	No Saving in Consumption			20% Saving no tariff increase			20% Saving & tariff increase		
		Tariff	kl Used	Charge	Tariff	kl Used	Charge	Tariff	kl Used	Charge
1	0 kl -6 kl	R 0.00	6	R 0.00	R 0.00	6	R 0.00	R 0.00	6	R 0.00
2	+ 6kl - 12 kl	R 2.15	6	R 12.90	R 2.15	6	R 12.90	R 2.32	6	R 13.92
3	+12 kl - 20 kl	R 4.30	8	R 34.40	R 4.30	8	R 34.40	R 6.15	8	R 49.20
4	+20kl - 40kl	R 5.48	5	R 27.40	R 5.48	0	R 0.00	R 10.41	0	R 0.00
5	+40 kl - 60kl	R 6.67	0	R 0.00	R 6.67	0	R 0.00	R 13.34	0	R 0.00
6	60kl +	R 8.60	0	R 0.00	R 8.60	0	R 0.00	R 17.20	0	R 0.00
<b>Total</b>			<b>25</b>	<b>R 74.70</b>		<b>20</b>	<b>R 47.30</b>		<b>20</b>	<b>R 63.12</b>

## **Management and Enforcement of Water Restrictions**

A critical element when imposing water restrictions is the ability to manage the imposition of the water restrictions. This includes, the ability to deal with special exemptions, the ability to effectively monitor the imposition of the water restrictions and the ability to deal with consumers who contravene the provisions of the Water Restriction Notices.

All the Magistrates in the Cape Metropolitan Area have agreed to a spot fine (Admission of guilt) of R1 000 throughout the City in terms of the Water Restriction Bylaw. Repeat offenders could be summonsed and liable for prosecution resulting in a fine of up to R10 000 or imprisonment up to six months or both. Water Services have staff with law enforcement status i.e. Water Inspectors, Water Pollution Officers and Water and Sanitation Officers who will be able to monitor compliance with the final notice and issue spot fines.

A strategy is being developed in conjunction with the City's Community Services Department (Parks and Forests) in order to ensure the City's compliance with the water restrictions.

Contraventions can be reported to the 24 hour number 086 010 3054. This number also serves as a help line.

## **Communications Strategy**

A Communications Strategy has been developed in conjunction with the Department of Water Affairs and Forestry (DWAFF) in order to raise public awareness and commitment to the required water savings targets during restrictions. The Strategy is one component of the Water Demand Management Strategy and is in line with the City's Corporate Communications Strategy.

## **Application for Exemptions**

All applications for exemptions must be directed in writing to one of the offices listed in the Final Restriction Notice. Exemptions will only be granted if warranted and must be approved by the Director: Water Services or senior staff sub-delegated for this purpose.

## **The City's Water Demand Management Strategy**

The City is in the process of developing a 10 point plan for achieving greater water conservation within the Cape Metropolitan Area (CMA). The purpose of the plan is to compliment the City's Water Demand Management Strategy and water restriction measures imposed during the water restriction period. The ten point plan aims to secure optimal efficiency, equity and sustainability in the supply and use of water.

The ultimate objective is to reduce the demand for water and thereby ensuring a sustainable and affordable supply of water for future generations.

### **How to save water in the home**

Generally, the highest domestic water use area is the garden, followed by toilet flushing and bathing/showering, these areas therefore hold the greatest potential for water saving. To help you become more water-wise, a few suggestions are listed below, which may be used successfully all year round, but are especially relevant in a restrictions period.

#### **Tips for your garden:**

- ◆ Only water lawns and gardens before 10:00 and after 18:00
- ◆ Consider re- using bath and sink water to water plants and/or lawns
- ◆ Indigenous plants shrubs and trees are the sensible choice in a water scarce area like Cape Town
- ◆ Mulching your flower beds retains the moisture in the ground and keeps back the weeds
- ◆ Using 2 buckets of water to wash the car can save up to 300l each time
- ◆ Fit a pool cover to restrict water lost through evaporation, therefore top-ups needed less frequently
- ◆ Use a broom to sweep driveways clean, not a hose
- ◆ Check garden taps and hoses for leaks, and repair

#### **Tips for your home:**

- ◆ Close the tap when cleaning teeth (saves up to 20l) or shaving (saves up to 45l)
- ◆ A bath uses an average of 160l, a 5 minute shower uses 60l - so shower rather than bath, but if you have to bath, then only run a small one or share your bath
- ◆ Rinse glasses, cutlery and vegetables in a basin of water, rather than under a running tap (you may then use this water in pot plants or in the garden)
- ◆ A toilet leak can waste up to 30l an hour - check if your toilet is leaking by adding a few drops of food dye to the cistern – if the colour seeps into the bowl, you have a leak which should be fixed as soon as possible
- ◆ Ensure all taps are fully closed – a dripping tap (1 drip per second) could waste up to 30l a day (that is equivalent to 10 000l a year!).
- ◆ Check your house for leaks by turning off all taps, wait at least half an hour (for tanks and cisterns to fill up), then check your water meter. If the dial is moving this means that water is running to waste somewhere, you probably have a leak, which may be underground
- ◆ Replace tap washers regularly and fit tap aerators to restrict and spread the flow, this saves water yet feels like you are using the same amount of water
- ◆ Installing a 'Hippo' bag or by cutting off the top half of a 2 litre plastic bottle and placing this under the ball-cock in the cistern, could save you up to 7 300l each year. If finances allow, it would be preferable to install a dual-flush toilet.

- ◆ Ensure washing machines and/or dishwashers have a full load before running
- ◆ Only put the amount of water in the kettle that you need – do not boil a kettle full, if not required