

Water Conservation

Harbonim Camp, Hermanus, 23 Dec 2017

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SOUTH AFRICA



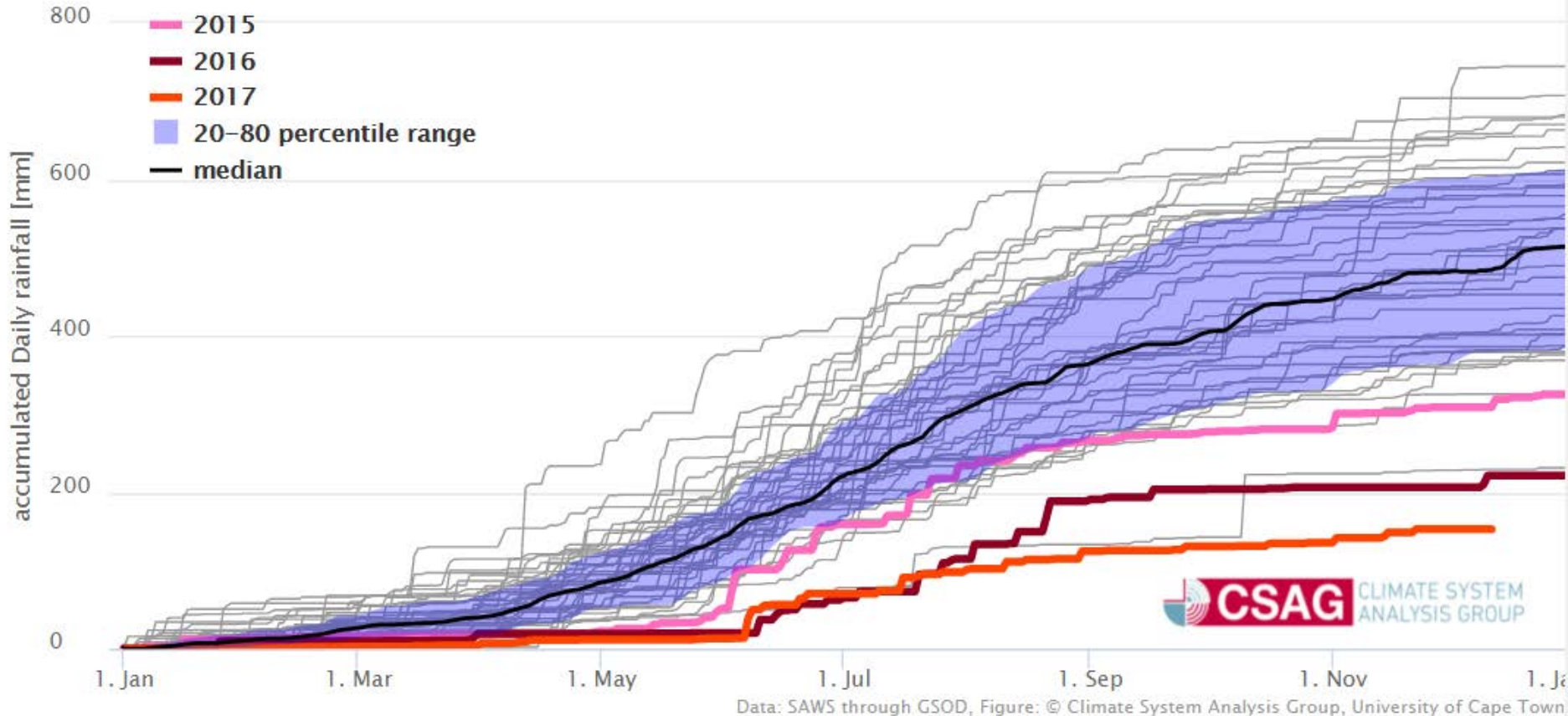
Format of presentation

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- Why water conservation?
- How is the City doing?
- Level 6 Water Restrictions
- Rainwater Harvesting
- Groundwater
- Water wise gardening
- Reduce pool water
- Reduce shower / bath water
- Reduce clothes washing water
- Low-flush toilets
- Greywater
- Making your house 'water sensitive'

What happened to the rain (1)? 2

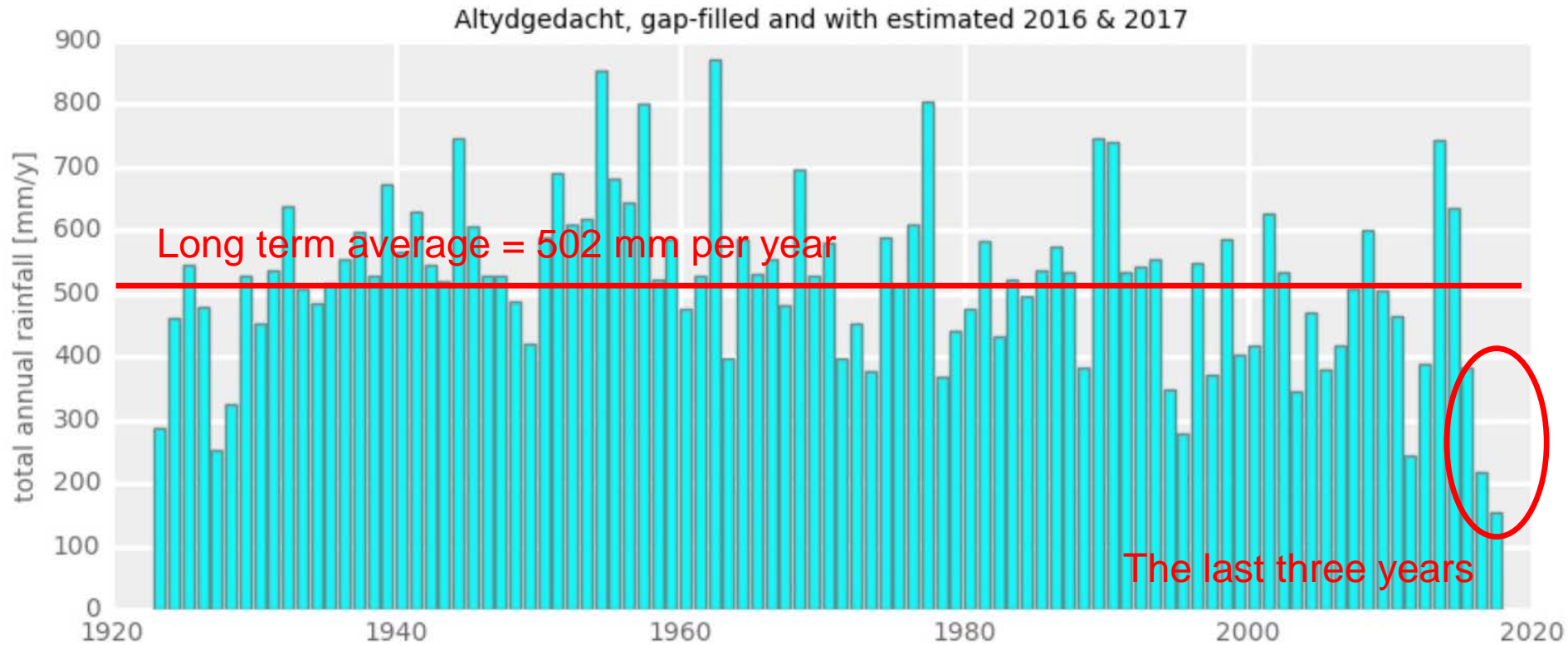
Accumulated daily rainfall at Cape Town Airport



Most recent value on: 2017-12-11

What happened to the rain (2)?

3



These are the resulting return intervals:

2-year (2016-2017) rainfall: 1150 years

3-year (2015-2017) rainfall: 628 years

4-year (2014-2017) rainfall: 63 years

5-year (2013-2017) rainfall: 10 years

Wow! Major trouble...

<http://www.csag.uct.ac.za/2017/08/28/how-severe-is-this-drought-really/>



Theewaterskloof Dam (main supply) 4



In good years

<https://hiveminer.com/Tags/africa%2Cdam>

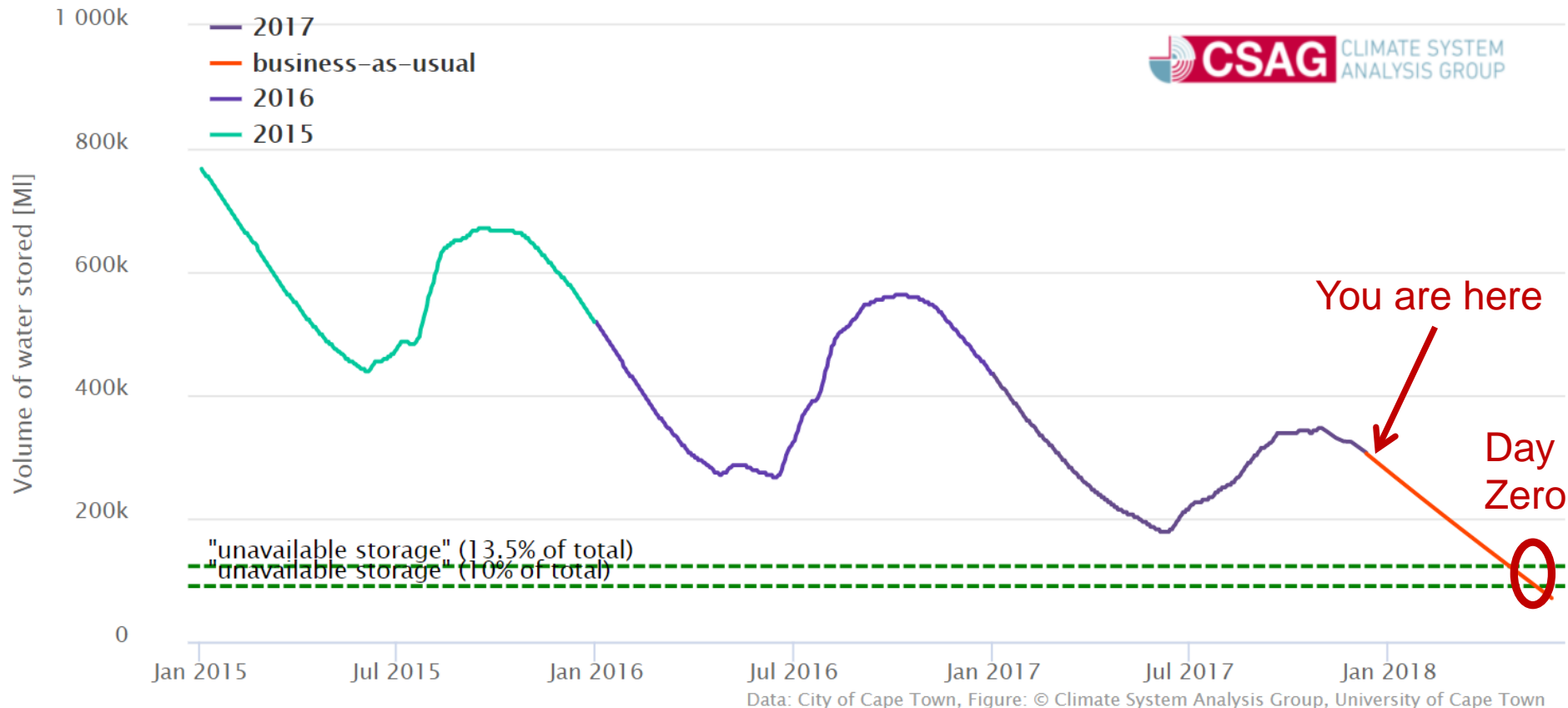


Now...

When is 'Day Zero'?

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Big Six WCWSS dams



Most recent value on: 2017-12-11

<http://cip.csag.uct.ac.za/monitoring/bigsix.html>

1. **Preservation** restrictions: reduce daily use to 500Ml/day through pressure management and installation of water management meters on properties with excessive water use.
2. **Disaster** restrictions: water cut off to all except essential services. Water collection sites established across city.
3. **Full-scale (extreme) disaster** implementation: drinking water only.

<http://resource.capetown.gov.za/documentcentre/Documents/City%20strategies%2C%20plans%20and%20frameworks/Critical%20Water%20Shortages%20Disaster%20Plan%20Summary.pdf>

What does it mean?

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We need to restrict ourselves to 87 litres – or about four buckets full – per person per day for all uses now, or

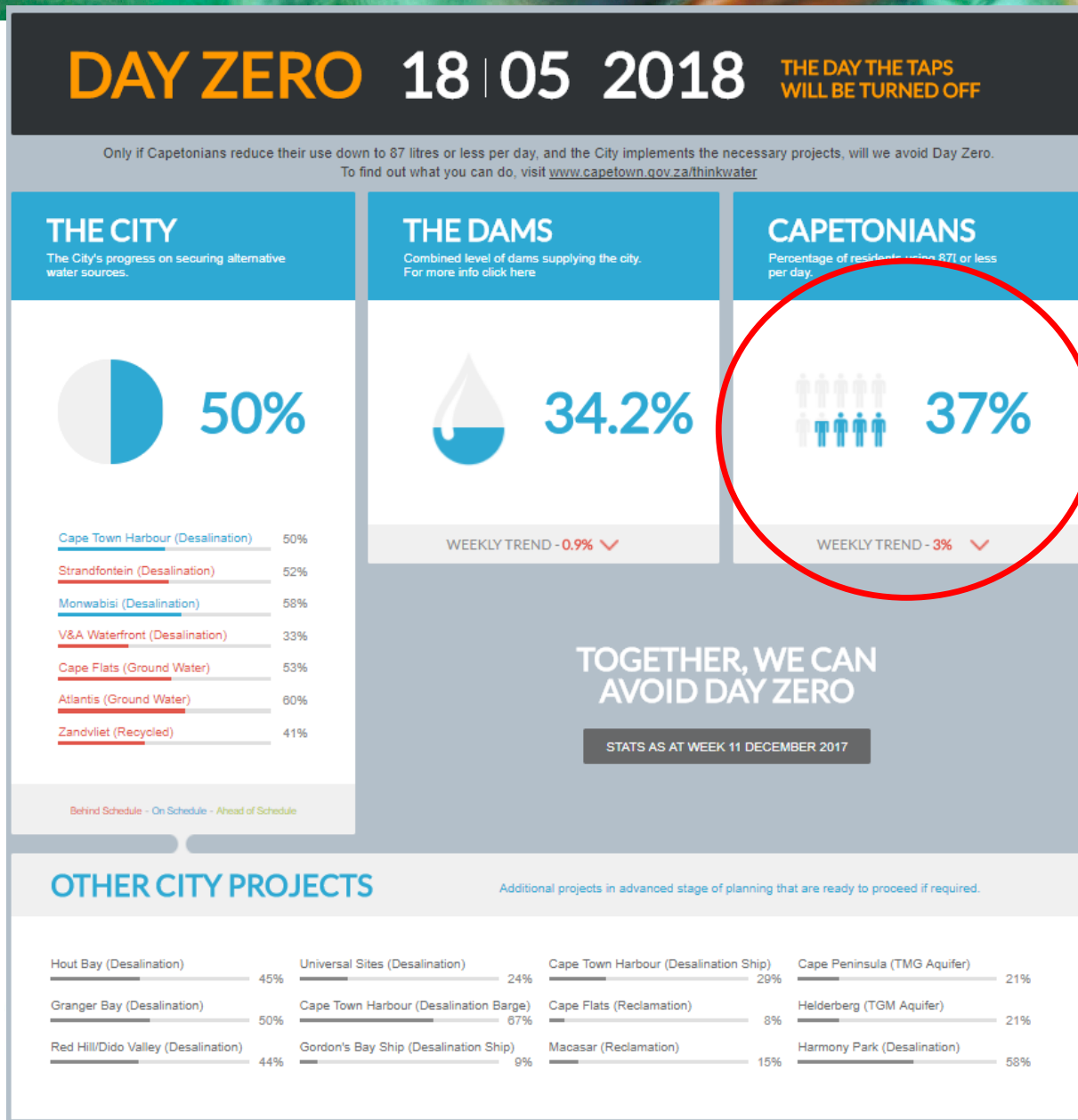
**We all need to cooperate if
‘Day Zero’ is to be avoided**

We will be restricted to 25 litres– or about one bucket full – per person per day which we will have to collect from central distribution points protected by the army...



The CoCT 'Water Dashboard'

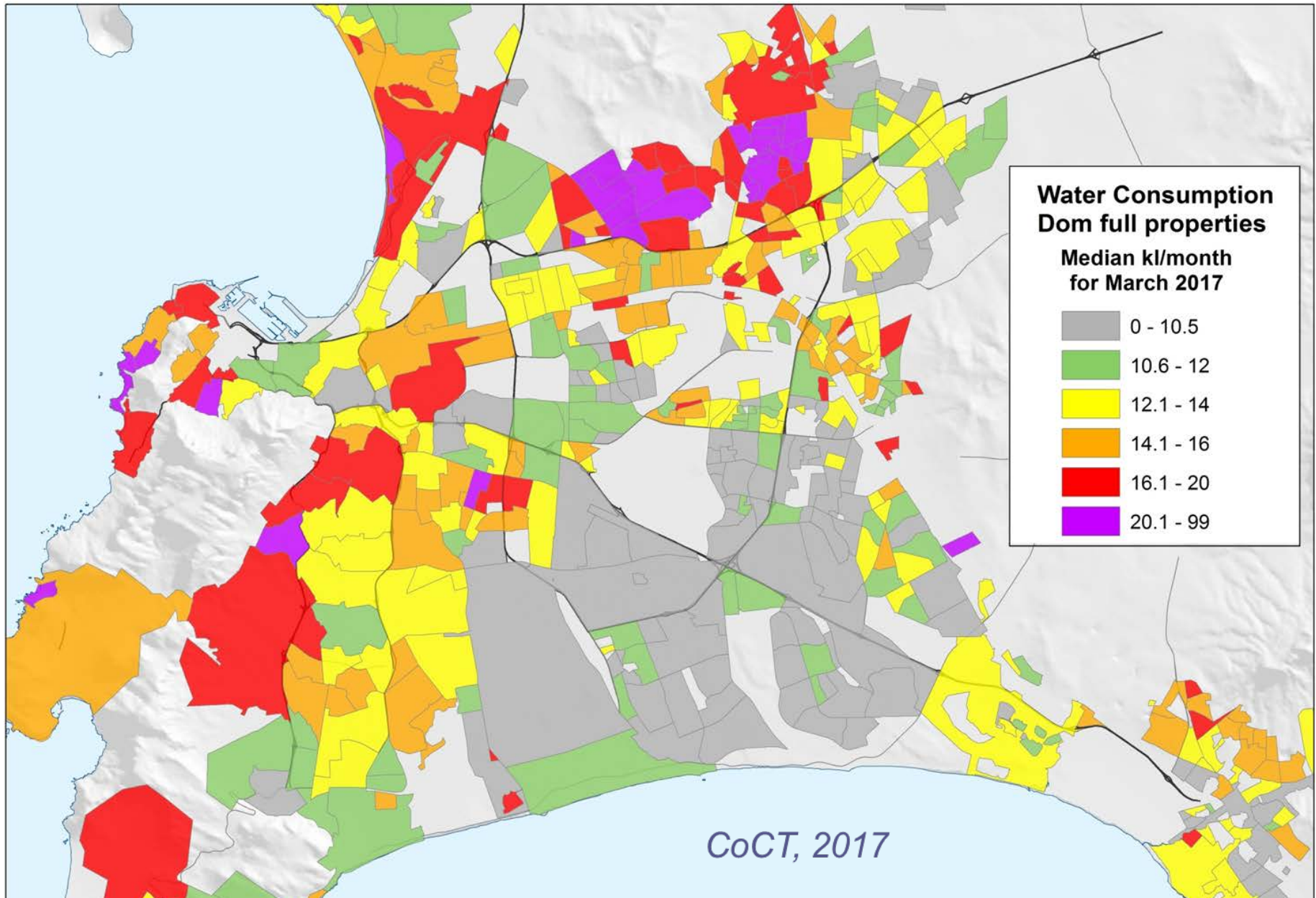
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http://coct.co/water-dashboard/?ca_source=Website&ca_medium=affiliate&ca_campaign=Home%20page%20trends%20-%20Day%20Zero%20Dashboard&ca_term=Day%20Zero%20Dashboard&ca_content=Day%20Zero%20Dashboard

Where are the 'water wasters'?

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CoCT Level 6 restrictions

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CITY OF CAPE TOWN

PUBLIC NOTICE IN TERMS OF SECTION 36(1) OF THE CITY OF CAPE TOWN WATER BY-LAW, 2010

In view of the ongoing dire drought situation, the Director: Water and Sanitation of the City of Cape Town hereby gives notice of level 6 water restrictions and measures as detailed herein.

In summary, key new restriction measures include:

- residential units consuming more than 10 500 litres per month will be prioritised for enforcement
- non-residential properties to reduce consumption by 45%
- agricultural users to reduce consumption by 60%
- the use of borehole water for outdoor purposes is discouraged in order to preserve groundwater resources




Please note that permission from the National Department of Water and Sanitation is required in order to sell or buy borehole/wellpoint water.

Failure to comply with this notice may constitute an offence in terms of the aforementioned By-Law (or as amended) and the accused will be liable to an admission of guilt fine and, in accordance with Section 36(4) of the Water By-Law, 2010 (or as amended), an installation of a water management device(s) at premises where the non-compliance occurs. The cost thereof will be billed to the relevant account holder.

This notice is effective from 1 January 2018.

5-6 people @ ±
50 / day each!

The City is
getting tough...

		WATER (Period 03/11/2017 to 02/12/2017 - 30 Days) (Actual reading)	11/4.09
		At 6 KELVIN ROAD, BERGVLIET / Erf 456	
		Meter no: 38323621 Consumption 8.000 kl / Daily average 0.267 kl	
*		Consumption charge (domestic)	
		(1) 5.9180 kl @ R 4.0000 (2) 2.0820 kl @ R 15.5700	56.09
			56.09
		REFUSE (Period 08/11/2017 to 06/12/2017) 29 Days	
		At 6 KELVIN ROAD, BERGVLIET / Erf 456	
*		Refuse charge (1 X 240IBIN X 1 Removals)	119.47
			119.47
		SEWERAGE (Period 03/11/2017 to 02/12/2017 - 30 Days) (Actual reading)	
		At 6 KELVIN ROAD, BERGVLIET / Erf 456	
*		Disposal charge	
		(1) 4.1420 kl @ R 3.8500 (2) 1.4580 kl @ R 13.1400	35.11
			35.11

Level 6 restrictions summary

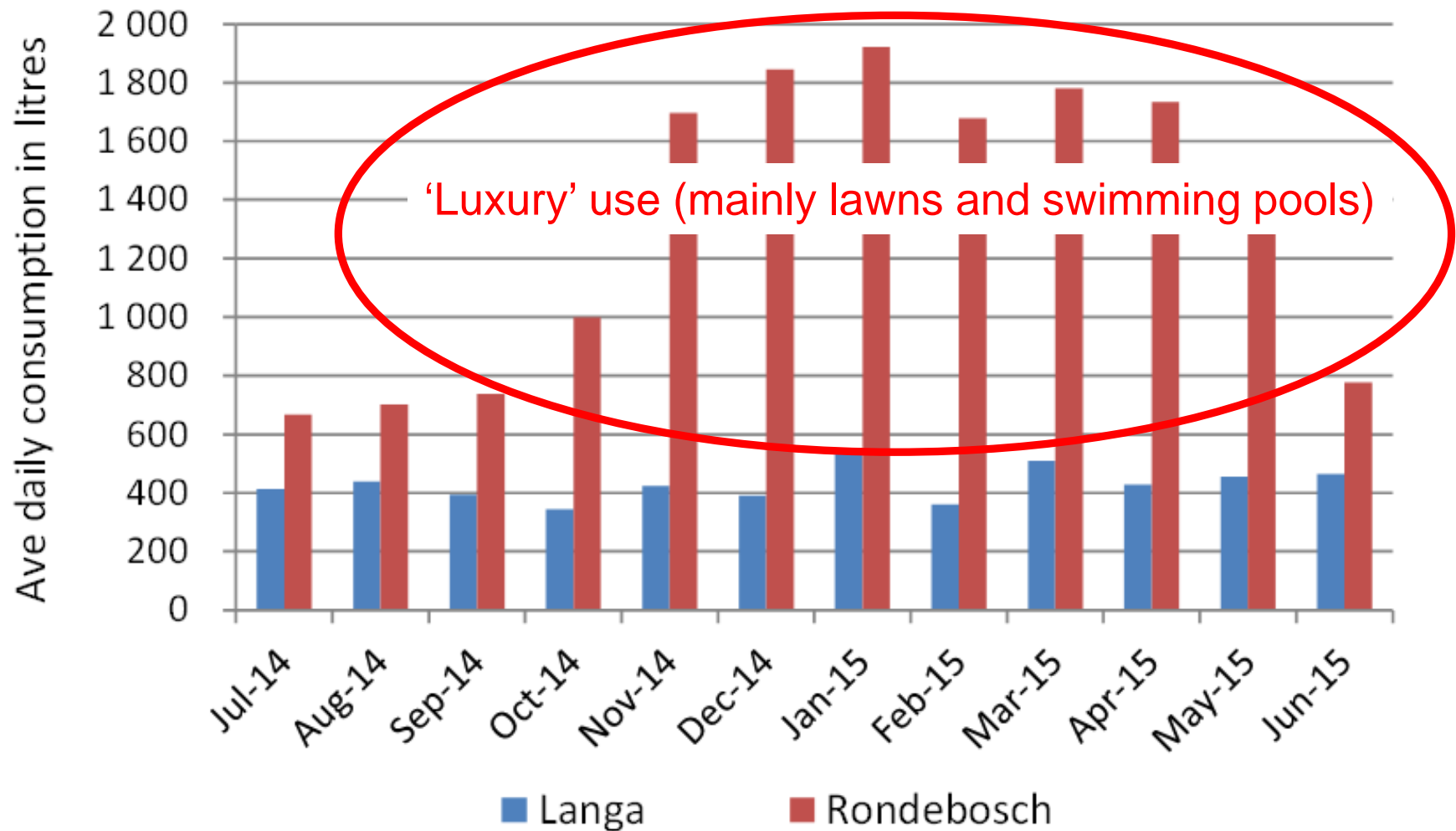
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- No watering/irrigation with municipal drinking water allowed.
- The use of borehole/wellpoint water for outdoor purposes, ..., is strongly discouraged
- All boreholes and wellpoints must be registered with the City
- No topping up...filling or refilling of swimming pools with municipal drinking water is allowed, even if fitted with a pool cover.
- The use of portable or any temporary play pools is prohibited.
- No washing of vehicles ... with municipal drinking water allowed.
- No washing or hosing down of hard-surfaced or paved areas with municipal drinking water allowed.

Level 6 restrictions summary (cont.) 12

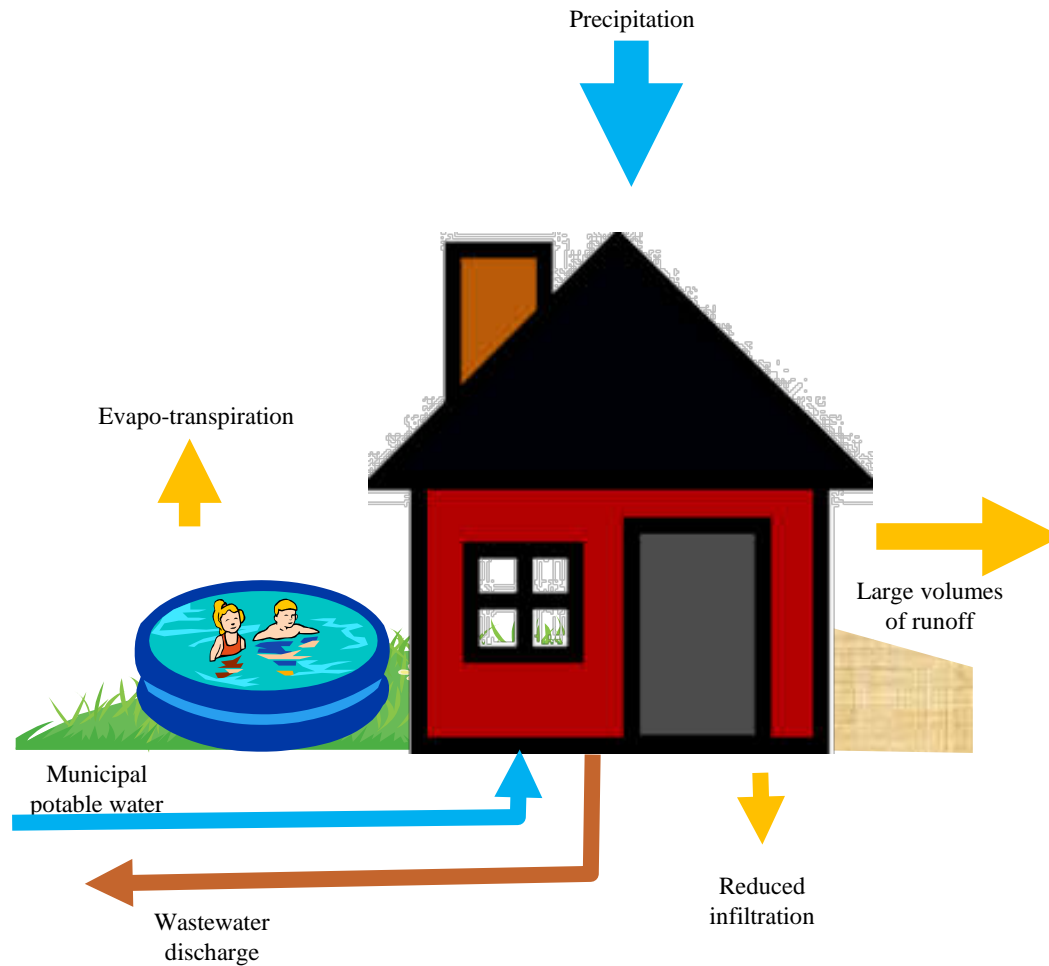
- The use of municipal drinking water for ornamental water fountains or water features is prohibited.
- Customers are strongly encouraged to install water efficient parts, fittings and technologies to minimise water use at all taps, showerheads and other plumbing components.
- Single residential properties consuming more than 10 500 litres of municipal drinking water per month will be liable to an admission of guilt fine and, in accordance with Section 36(4), an installation of a water management device(s) at premises where the non-compliance occurs. The cost thereof will be billed to the relevant account holder.
- You are encouraged to flush toilets (e.g. manually using a bucket) with greywater, rainwater or other non-drinking water.

Ave daily use: 'Rich' versus 'Poor' 13



The water wasteful 20th Century house

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Know how much water you are using

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Two approaches to rainwater harvesting: store and directly use (left), infiltrate for later extraction via well-point (above)

Groundwater is often available

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Depending on where one lives, it is often possible to tap into the groundwater using a wellpoint (pump at surface) or borehole (pump at the bottom of the hole). This water, however, is often contaminated and cannot generally be used for drinking purposes. It is best used for watering the garden, topping up the swimming pool or flushing toilets. Beware of dissolved iron which will stain (rust!).



<http://www.adsm.com/water-services/borehole-evaluation/>




Avoid planting anything that requires watering (other than, perhaps, to get established. In particular...

Avoid lawn

Don't water the verges

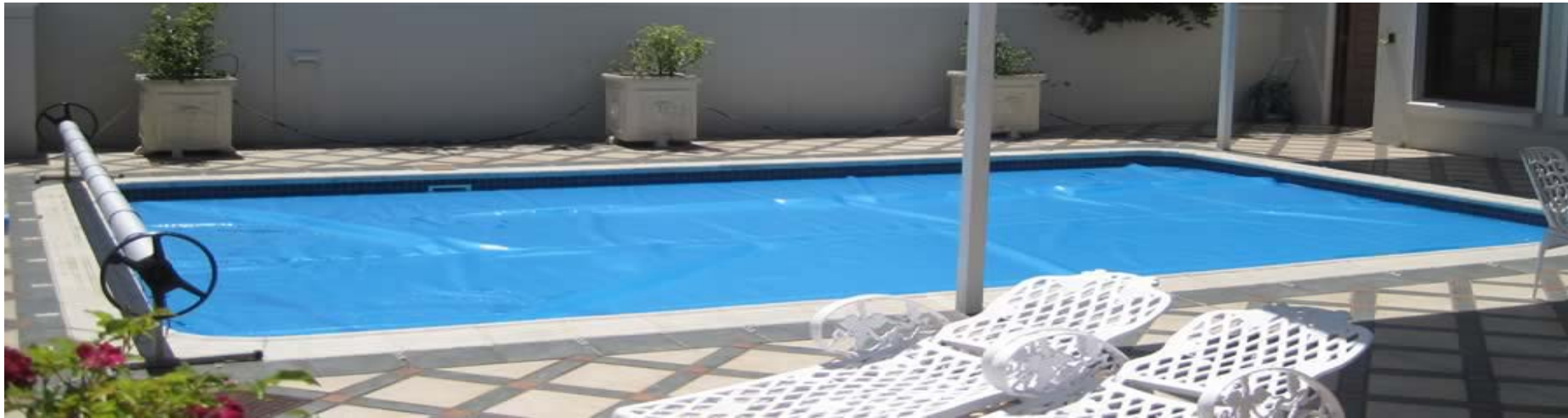
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The verge doesn't belong to you, it belongs to the Council; use water-wise plants if you must 'pretty it up'

Use a pool cover

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<http://www.poolcoverssa.co.za/solar-2000-pool-blankets.htm>

A study undertaken by Siebrits (2012) investigated the impact of swimming pools on residential water demand in CoCT and found that they increase household water use by ... 8.85 kℓ/month on average

A large proportion of this is evaporation...

Don't let the tap run unnecessarily 21





Bad

Keep showers to under 2 minutes; use a bowl to catch as much of the water as possible. Use this to flush the toilet.

Good



Don't wash the car with water

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Clothes washing machine

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Only wash clothes once the drum is full. Select the most 'water-wise' programme.

Install low-flow toilets

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Use bathwater to flush toilet

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If you must bath, only use just the minimum amount of water possible. Allow family members to use the same water (use a tiny bit of hot water to keep warm). Use water to flush the toilet.

Use a bucket to transfer water. It helps to swish around the sides (like the normal flush)

Avoid unnecessary flushing

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‘If it’s yellow,
let it mellow.

If it’s brown,
flush it down’



Combining greywater with rainwater

You can successfully combine greywater and harvested rainwater to irrigate your garden. Certain greywater system suppliers can install a trickle feed from a rainwater tank to introduce water into the greywater system at a very slow rate. Ask your system supplier what services and follow-up maintenance are included in their package.



Useful information

CITY OF CAPE TOWN CALL CENTRE

Tel: 0860 103 089

Water conservation tips and information, alternative water usage, bursts, blockages and water by-law transgressions

BOREHOLE WATER ASSOCIATION OF SOUTHERN AFRICA

Tel: 011 447 0851

For a list of borehole contractors in your area

DEPARTMENT OF WATER AFFAIRS

Tel: 012 336 8125/8046

Aquifer/groundwater quality information

KIRSTENBOSCH BOTANICAL GARDEN

Tel: 021 799 8783

Water-wise gardening tips/information

WATER BY-LAW

Government Gazette 6378: 01/09/06

WATER AND SANITATION



CITY OF CAPE TOWN | IIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

GREYWATER RE-USE



Greywater is the dirty water from showers, baths and washing machines NOT kitchen sinks or toilets



Be part of the solution and
install a greywater system today!



CITY OF CAPE TOWN | IIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU



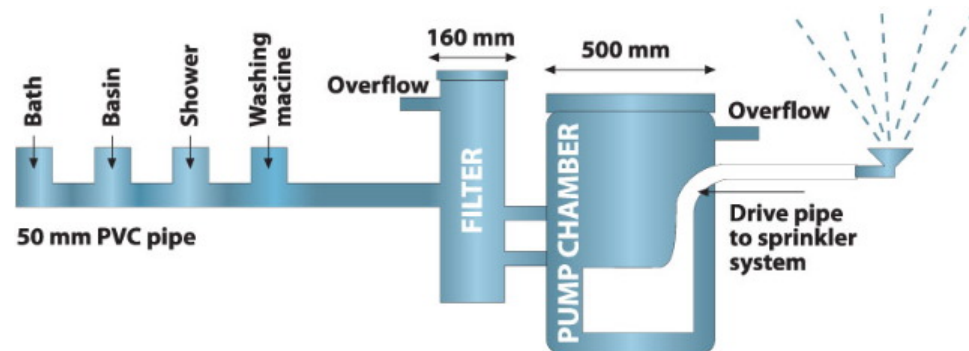
Be part of the solution
Our water, our pride

Simple home-based greywater systems 29

Photos courtesy of Kevin Winter



<http://www.waterrhapsody.co.za/grey-water-systems/grey-water-faq/>



Domestic greywater on the 'cheap'! 30



A simple way of keeping plants in pots alive – but be careful, always cook before eating anything irrigated with greywater as it contains high levels of bacteria etc...

Combined rain- and greywater harvesting 31



Greywater can be extremely dangerous

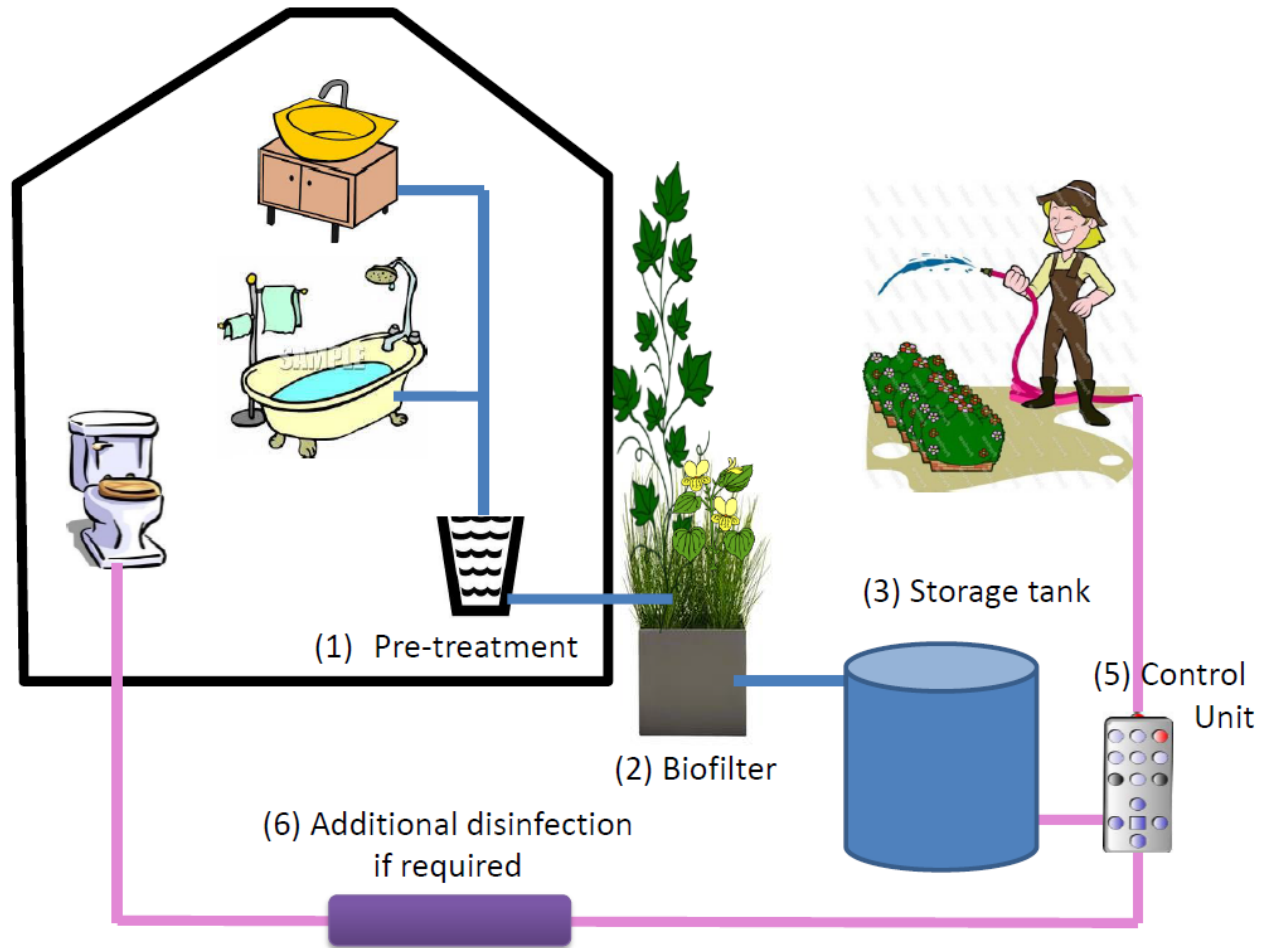
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Reference	Eriksson <i>et al.</i> , 2003		Rose <i>et al.</i> , 1991			Cassanova <i>et al.</i> , 2001
Source	Composite	Shower	Laundry wash	Laundry rinse	Composite	Composite
Concentration (mg/l unless otherwise stated)	Range		Range			Range
Faecal coliforms (CFU/100ml)		6.0×10^3	126	25	1.82×10^4 - 7.98×10^8	5.63×10^5
Faecal Streptococci (Enterococci) (CFU/100ml)						2.38×10^2
<i>E. coli</i> (CFU/100ml)	<100-2800					

For formal fully serviced residential houses – greywater in informal settlements will have very different characteristics

Greywater recycling system

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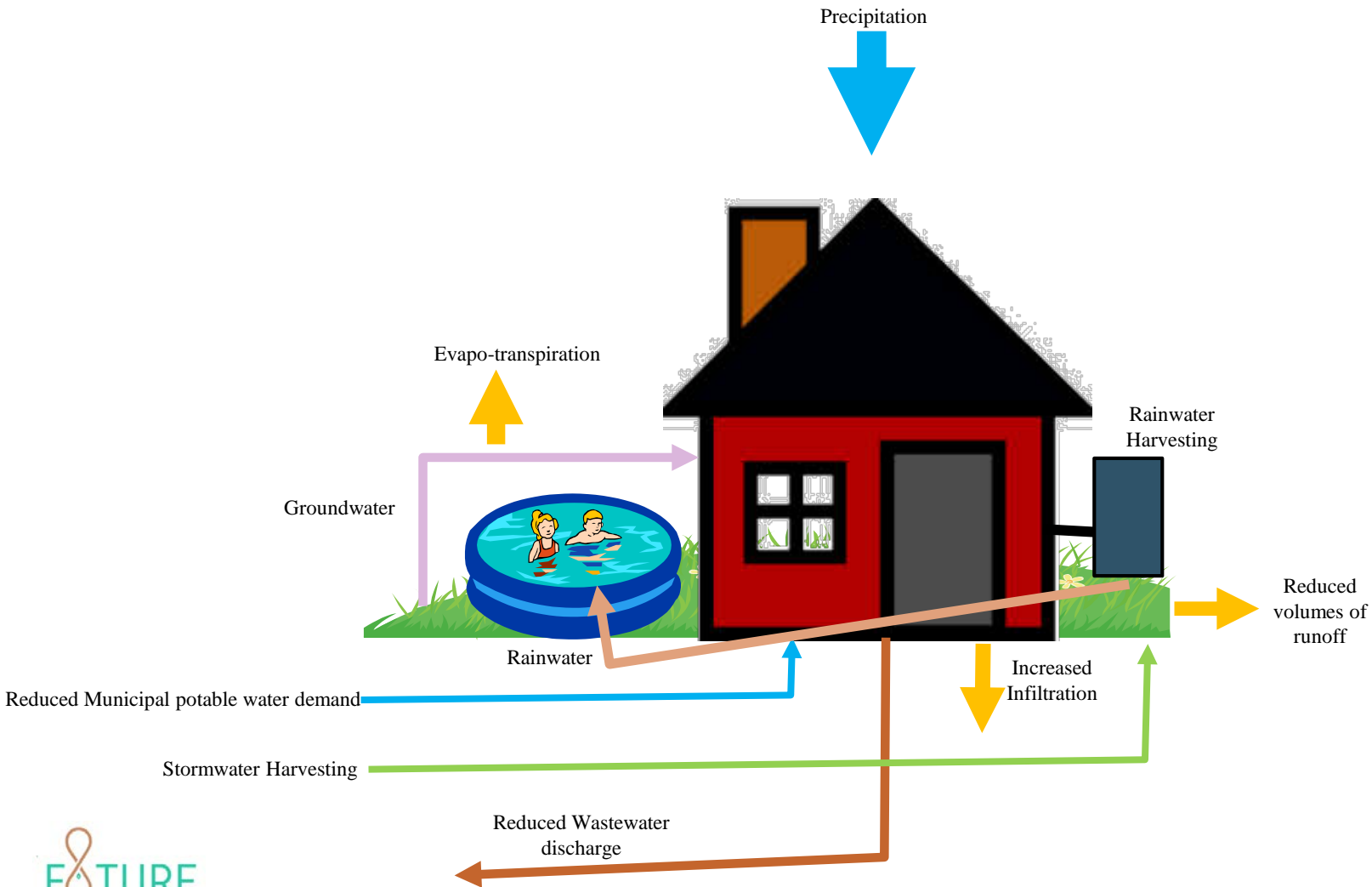


1. Fix the leaks
2. Ensure installation of 'low flow' devices (showers, washing machines etc.) throughout
3. Install low flush toilets (some newer designs need hardly any – or no – water at all)
4. Collect and store as much rain/stormwater runoff as is reasonably possible with your limited space; use for garden watering or flushing toilets

5. Install greywater watering systems – ensure that the water is not left to stand for more than 24 hours. Be careful when handling greywater. Do not eat fruit or vegetables irrigated with greywater without first cooking
6. Do not allow any plants that need watering once established (ideally indigenous; alternatively plants that are adapted to CT climate). Avoid lawns.
7. Use a pool cover if you have a pool. You may not use municipal water to fill / top it up

The water sensitive 21st Century house

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Questions?

<http://www.futurewater.uct.ac.za/>