Cape Town Water Strategy

*never waste a good crisis*

Presentation at Public Launch

**Michael John Webster** – Executive Director, Water and Waste

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Making progress possible. **Together.**
Cape Town’s water challenges are not unique, we are part of a global community facing significant climate-related challenges. A quarter of humanity face a looming water crisis.
Core goal: providing reliable, safe & affordable services to our 4 million customers

Formal areas
3.5 million people, 650,000 connections

Informal settlements
0.5 million people

Water Supply:
- 6 large dams
- 12 water treatment plants
- 24 reservoirs
- 11,000 km of pipelines
- 1,400 million litres/day peak production

Sanitation:
- 9,000 km of sewers
- 26 wastewater treatment works
- 3 sea outfalls

Water and Sanitation Department:
- 12 branches; 4,800 staff; 63 Depots
- R7.5 billion opex; R3 billion capex

R75 billion assets

Businesses, industry & institutions
40,000 customers
200 years of reliance on surface water sources

1834: 36 free flowing fountains
1840: municipal responsibility for water supply
1881: first restrictions 4 to 3hrs/day
1889: District waterworks co. formed
1892: Table mountain dams construction started
1912: Water rationing to 12hrs/day
1913: Greater CT municipality
1916: Water rationing to 4hrs/day
1956: Promulgation of Water Act
1997: Local government restructuring

Storage
Water Treated

1930s
1940s
1950s
1960s
1970s
1980s
1990s
2000s
2010s

Derg River
TWK
Upper Steenbras
Voelvlei
Wemmershoek
Steenbras
Steenbras
Steenbras

Woodhead tunnel
Woodhead dam
Hely Hutchinson, Victorian & Alexandra
De Villiers dam
Demand > supply
Demand > supply
Demand > supply
Demand > supply
Demand > supply
1834 1st reservoirs
Demand > supply
95% of Cape Town’s water comes from a national government controlled regional surface water scheme

<table>
<thead>
<tr>
<th>Six major dams:</th>
<th>Volume (million m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 national government dams</td>
<td>770</td>
</tr>
<tr>
<td>3 Cape Town dams</td>
<td>130</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>900</strong></td>
</tr>
</tbody>
</table>
The drought was a wake up call, but things could become even more difficult in future.

Cape Town’s largest dam, Theewaterskloof -- 10% full during the height of the drought.
The experience of Perth offers a warning and a lesson: Perth and Cape Town both rely on winter cold fronts for their rain.

When fronts pass south of Cape Town, there is no rain. Perth is just 2 degrees north of Cape Town.
Perth dam inflows have reduced by 85% and they have diversified their sources – ground water and desalination.

* GDP per capita (World Bank data, 2019)
The drought is not over…
A strategic response: using the crisis to clarify priorities

Our shared water future

Cape Town’s water strategy

Making progress possible. Together.
Five commitments in the Water Strategy

1. Safe access to water and sanitation **for all**

2. **Wise water use** through pricing, regulation, active citizenship, network management

3. **Sufficient, reliable water from diverse sources:** surface, ground, desalination, reuse (Water resilient by 2030)

4. **Shared benefits & managed risks** from regional water resources

5. **Water sensitive city** by 2040
Inspirations

Singapore

- Prioritise water security
- Becoming water sensitive
- Excellence in execution

Strong political leadership

Medellin, Colombia

- Prioritise social inclusion
- Integrated approach
- Innovation & adaptation

Singapore slums, 1965

Medellín homicide rate 1990-2018
Time-frames to implement strategy

20

Becoming water sensitive

*City-wide transformed relationship to water*

*Healthy water ways (inclusive and safe to use)*

*Stormwater as a resource*

10

Becoming water resilient

*Sufficient water from diverse sources*

*Robust regional water system*

*Wise use*

3

Building capability

*Creating the necessary capabilities to deliver on strategy commitments effectively*
Improving the daily water & sanitation experience of half a million people living in informal settlements

Commitment 1
Commitment 2: Maintaining wise water use

Total water use in Cape Town in liters per person per day
#1 WATER-SAVING CITY IN THE WORLD

International Water Association award in May 2018 for a 55% reduction in water demand between 2015 and 2017, without resorting to intermittent supply.

Awarded C40 Award for Adaptation in 2015 for Water Conservation and Demand Management

C4O CITIES

Commitment 2
More predictable restriction levels

NOTE – these are indicative dam levels for implementing restriction levels at the beginning of the hydrological year (November each year). Flexibility may be required sometimes, particularly in relation to the overall operation of the Western Cape Water Supply Scheme.

All information on restrictions will be updated on: www.capetown.gov.za/thinkwater
Commitment 3: Sufficient water from diverse sources
### Capital programme of R6 billion over 10 years

The City of Cape Town is committed to constructing over 300 MLD of additional capacity in the next 10 years to mitigate future droughts.

#### Table 1: Committed New Water Programme over Ten Years - Provisional Yields and Costs

<table>
<thead>
<tr>
<th>Intervention*</th>
<th>First water</th>
<th>Effective yield</th>
<th>Total capex</th>
<th>Unit capex**</th>
<th>Operation cost***</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mℓ/day</td>
<td>Million kℓ pa</td>
<td>R million</td>
<td>Rm/Mkℓ</td>
<td>R/kℓ</td>
</tr>
<tr>
<td>Demand management</td>
<td>2019</td>
<td>70</td>
<td>26</td>
<td>410</td>
<td>6</td>
</tr>
<tr>
<td>Alien vegetation clearing</td>
<td>2019</td>
<td>55</td>
<td>20</td>
<td>610</td>
<td>31</td>
</tr>
<tr>
<td>Management of WCWSS</td>
<td>n/a</td>
<td>27</td>
<td>10</td>
<td>610</td>
<td>~1-2</td>
</tr>
<tr>
<td>Cape Flats aquifer ph 1</td>
<td>2020</td>
<td>20</td>
<td>7,3</td>
<td>610</td>
<td>31</td>
</tr>
<tr>
<td>Table Mountain Group ph 1</td>
<td>2020</td>
<td>15</td>
<td>5,5</td>
<td>375</td>
<td>25</td>
</tr>
<tr>
<td>Cape Flats aquifer ph 2</td>
<td>2021</td>
<td>25</td>
<td>9,1</td>
<td>450</td>
<td>18</td>
</tr>
<tr>
<td>Atlantis aquifer</td>
<td>2021</td>
<td>10</td>
<td>4</td>
<td>290</td>
<td>29</td>
</tr>
<tr>
<td>Table Mountain Group ph 2</td>
<td>2022</td>
<td>15</td>
<td>5,5</td>
<td>335</td>
<td>23</td>
</tr>
<tr>
<td>Table Mountain Group ph 3</td>
<td>2022</td>
<td>20</td>
<td>7,3</td>
<td>326</td>
<td>16</td>
</tr>
<tr>
<td>Berg River augmentation</td>
<td>2023</td>
<td>40</td>
<td>15</td>
<td>1 360</td>
<td>20</td>
</tr>
<tr>
<td>Water reuse ph 1</td>
<td>2024</td>
<td>70</td>
<td>26</td>
<td>1 650</td>
<td>33-40</td>
</tr>
<tr>
<td>Desalination ph 1</td>
<td>2026</td>
<td>50</td>
<td>18</td>
<td>5 806</td>
<td></td>
</tr>
<tr>
<td><strong>Total, including WDM</strong></td>
<td></td>
<td></td>
<td></td>
<td>5 806</td>
<td></td>
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<tr>
<td><strong>Total new supply</strong></td>
<td></td>
<td></td>
<td></td>
<td>5 396</td>
<td></td>
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Moving away from reliance on surface water

**CURRENT WATER RESOURCES SPLIT**
- Groundwater: 4%
- Surface water: 96%

**2040 WATER RESOURCES SPLIT**
- Desalination: 11%
- Groundwater: 7%
- Reuse: 7%
- Surface water: 75%
Groundwater implementation well underway

Cape Flats Managed Aquifer Recharge (20-48 MLD)

Table Mountain Group Aquifer (15-45 MLD)

Atlantis Managed Aquifer Recharge Scheme (10 MLD Expansion)
Reuse Demonstration Plant
(10 MLD)
Faure New Water Scheme
(70 – 100 MLD / R1,6 b)
Temporary desalination plants

Strandfontein Temporary Desalination Plant (7 MLD)

Monwabisi Temporary Desalination Plant (7 MLD)
Permanent Desalination
(50-150 MLD / R 6-7 b)

- Scoping and Pre-Feasibility Studies on sites completed.

- Feasibility studies in progress
  - Detailed investigations
  - Conceptual designs
  - Preferred site selection

- EIA process to be followed

- Committed to first water by 2026
The popular Weekly Water Dashboard has been refreshed to provide additional information on our various water sources.

Additional ways to share more information under development.
Commitment 4: Reducing regional water resource risks

City is working with key stakeholders and partners to reduce regional water risks and is managing an invasive plant clearing programme.
Commitment 4

Clearing alien invasive vegetation

Removing thirsty alien vegetation in catchment areas increases water flow yields into our dams.
Commitment 5: **Transition to Water Sensitive City**

*Cape Town will optimise and integrate the management of water resources to improve resilience, competitiveness and liveability for all of its people.*

- Optimises and integrates all water resources (surface, ground, waste and storm water)

- Values water and increases efficiency of use through water sensitive urban design

- Maintains healthy waterways and coastal waters: inclusive & safe use
The state of our rivers

E-coli levels in rivers (2019, % of samples)

Month (January to December)

Year average

<table>
<thead>
<tr>
<th>Percentage</th>
<th>E-coli Levels</th>
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<tbody>
<tr>
<td>&gt; 100 000</td>
<td></td>
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<tr>
<td>&gt; 10 000</td>
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<tr>
<td>&gt; 4 000</td>
<td></td>
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<td>&gt; 2 000</td>
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<td>&gt; 1 000</td>
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<tr>
<td>&lt; 1 000</td>
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Commitment 5

100 monitoring points
Monthly samples
But moving towards a water sensitive city will take time...

**SINGAPORE**

Launched 2006
100 projects in 24 years
10x Cape Town resources

**SYDNEY**

Launched 2018
50 year vision
9x Cape Town resources
25 wastewater treatment works treating 497 million litres a day (ML/day)

Design capacity: 760 ML per day
A major Wastewater Treatment capital program is underway

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<tr>
<td></td>
<td>R 850 m</td>
<td>R 890 m</td>
<td>R 1 056 m</td>
<td>R 1 590 m</td>
<td>R 1 407 m</td>
<td>R 1 012 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major expansion projects</th>
<th>Additional MI per day</th>
<th>Completion date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potsdam</td>
<td>53</td>
<td>2025</td>
</tr>
<tr>
<td>Athlone</td>
<td>50</td>
<td>2025</td>
</tr>
<tr>
<td>Zandvliet</td>
<td>18</td>
<td>2024</td>
</tr>
<tr>
<td>Macassar</td>
<td>36</td>
<td>2026</td>
</tr>
</tbody>
</table>

Other major projects

- Cape Flats mechanical rehabilitation
- Cape Flats Biosolids Beneficiation Facility

Other smaller projects
Creating capability for more effective implementation
Seven transitions to become a world class provider

1. **Water resilience**: sufficient water in context of climate change
2. **Water quality transition**: transformed water ways
3. **Customers**: developing trust
4. **Social inclusion**: expanding inclusion
5. **Finance**: becoming sustainable
6. **Product & processes**: improving integration, efficiency & compliance
7. **Staff**: developing pride and increasing motivation
Becoming a leading water provider in Africa and Globally

Cape Town has become a leader in water demand reduction.

Can we demonstrate outstanding innovation in two other areas of utility management to become the first leading utility of the world in Africa?

41 leading utilities of the world

www.leadingutilities.org
Cape Town is creating the capability to implement its strategy & become world class
Thank you