

## Western Cape Water Supply System Reconciliation Strategy

Administrative and Technical Support Group  
Meeting #6 – 26 November 2014


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### “Are we comparing apples with pears?”

- **Total System Yield:** 596.0 million m<sup>3</sup>/a  
– Berg WAAS (2009)
- **Total Allocations:** 584.1 million m<sup>3</sup>/a  
– Several legal agreements  
– Possible double-counting
- **2013/2014 Water use:** 508.1 million m<sup>3</sup>/a  
– Domestic water use: 338.1 million m<sup>3</sup>/a  
– Agricultural water use: ~ 160.0 million m<sup>3</sup>/a  
– Agriculture capped: 170.0 million m<sup>3</sup>/a


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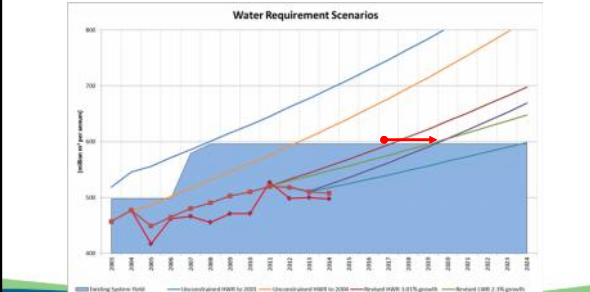
### “Are we comparing apples with pears?”

System Yield	Allocation	Water Use
WCWSS only	→	Use from WCWSS
Impact of external users	←	External users use
Apply different assurance of supply	→	Split between agri and domestic allocation
	→	Capped agri allocation
Water requirement scenarios	→	License vs. allocation
	→	Additional licenses
	→	Actual water use vs. adjusted water use

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## Water Requirement Scenarios

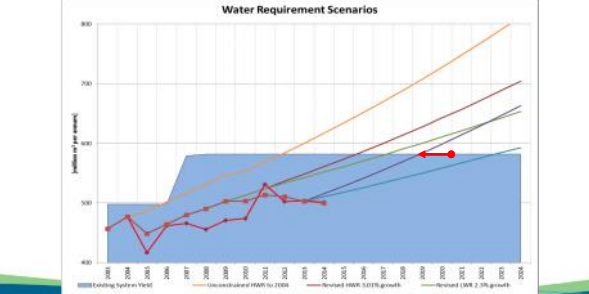


**Next Intervention: 2022**

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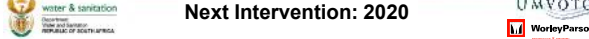


## Water Requirement Scenarios



**Next Intervention: 2020**


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### “Apples and Pears”

- **Total System Yield:** 596.0 million m<sup>3</sup>/a
- Legacy Hydrology: 570 million m<sup>3</sup>/a
- Berg WAAS System yield: 596 million m<sup>3</sup>/a
- WRPM assessment: 582 million m<sup>3</sup>/a

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## Water Availability – Legacy

- Capacity and yield of individual dams based on legacy hydrology prior to Berg WAAS

Dam	Capacity [million m <sup>3</sup> ]	Yield [million m <sup>3</sup> /a]
Theewaterskloof Dam	432	219
Voëlvllei Dam	158	105
Wemmershoek Dam	58	54
Upper Steenbras Dam	30	40
Lower Steenbras Dam	34	
Berg River Dam	127	80
Others		72
<b>Total</b>	<b>839</b>	<b>570</b>



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## Water Availability – Berg WAAS

- Historic Firm Yield: **556 million m<sup>3</sup>/a**
- 1:50 year stochastic yield: **579 million m<sup>3</sup>/a**
- Integrated System Yield: 596 million m<sup>3</sup>/a**



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## Water Availability – WRPM

- WRPM Scenario Assessment (DWS, 2014)
  - 80% savings of WC/WDM measures
  - Maximum urban sector curtailment: 20%
  - Reduced agricultural supply reliabilities
- Total system yield < 582 million m<sup>3</sup>/a**



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## Water Availability – Impacts

- Water requirement scenarios
  - 2012/13 base year
  - Total allocation
  - Additional requests
- Upstream developments
  - Klein Berg River and 24-Rivers
  - La Motte IB
  - Working for Water



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## Water Availability – other sources

- Users of WCWSS with supplementary sources:
  - CCT: dams on Table Mountain, Atlantis Wellfield
  - West Coast DM: Langebaan Road Aquifer
  - Drakenstein LM: e.g. Berg River and dams
  - Stellenbosch LM: Eerste River
  - Agriculture: farm dams
- Report all water use or only from WCWSS ??



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## “Apples and Pears”

- Total Allocations: 584.1 million m<sup>3</sup>/a**
  - Domestic use allocation **410.5 million m<sup>3</sup>/a**
  - Agricultural use allocation **173.6 million m<sup>3</sup>/a**
- Revised total allocation: 579.5 million m<sup>3</sup>/a**



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### Report: Allocations from WCWSS

- City of Cape Town: 385.9 million m<sup>3</sup>/a
- West Coast DM
  - Withoogte Misverstand: 17.44 million m<sup>3</sup>/a
  - Swartland Voëlvei: 4.20 million m<sup>3</sup>/a
- Stellenbosch LM: 3.00 million m<sup>3</sup>/a
- Agriculture: 173.6 million m<sup>3</sup>/a
- Total Allocation: 584.1 million m<sup>3</sup>/a**

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### Allocations from WCWSS

- Berg River Water Project Agreement (2003)
  - Domestic: 214.2
  - Agriculture: 162.3
  - **Temporary allocated to domestic: 28.0**
  - Additional yield of the Berg River Dam: 81.0
  - CCT dams: 94.0

Category	Current	Grant
Domestic	214.2	
Agriculture	162.3	
Temporary allocated to domestic	28.0	
Additional yield of the Berg River Dam	81.0	
CCT dams	94.0	
<b>Total</b>	<b>584.1</b>	

**Total Allocation: 551.5 million m<sup>3</sup>/a**

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### Domestic Use Allocation

CCT		Others	
Resource Name	Current Allocations		
Berg River Dam	81 000 000	• WC DM:	
Berg River (Voëlvei Dam)	70 400 000	– Misverstand	18.6
Theewaterskloof Dam, fixed volume	90 000 000	– Swartland	4.2
Theewaterskloof Dam, variable volume	28 000 000	• Stellenbosch:	
Palmiet River (Rockview & Kogelberg dams)	22 500 000	– Theewaterskloof	3.0
Upper and Lower Steenbras Dam	40 000 000	• Overberg:	
Wemmershoek Dam	54 000 000	– Theewaterskloof	4.0
<b>Total allocation for CCT from WCWSS</b>	<b>385 900 000</b>	• Piketberg and PPC:	
Small dams	6 300 000	– Berg River	1.5
Albion Spring	1 500 000	• <b>Total: 389.2 million m<sup>3</sup>/a</b>	
Atlantis Aquifer	5 000 000		
<b>Total allocation for CCT from own sources outside the WCWSS</b>	<b>12 800 000</b>		
<b>Total allocation for CCT</b>	<b>398 700 000</b>		

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### Agricultural Allocation

- Voëlvei & Misverstand
  - Lower Berg IB: 18.1 million m<sup>3</sup>/a
  - **24-Rivers IB: 11.5 million m<sup>3</sup>/a**
- Theewaterskloof Dam
  - Riviersonderend part: 46.2 million m<sup>3</sup>/a
  - Upper Berg River IB: 58.6 million m<sup>3</sup>/a
  - Tunnel and pipeline: 29.0 million m<sup>3</sup>/a
  - Irrigation Surplus: 10.4 million m<sup>3</sup>/a
- Total capped: 173.8 million m<sup>3</sup>/a**
- Total excl. 24-Rivers: 162.3 million m<sup>3</sup>/a**

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### Allocation – Use vs. Yield

Use allocation, based on quotas and licences	Yield allocation, assuming river and storage losses
• <b>WC DM: 17.4 million m<sup>3</sup>/a</b>	• WC DM: 18.6 million m <sup>3</sup> /a
• Lower Berg: 3 000 m <sup>3</sup> /ha/a = 10.9 million m <sup>3</sup> /a	• Lower Berg: 18.1 million m <sup>3</sup> /a
• Upper Berg: 74.9 million m <sup>3</sup> /a	• Upper Berg: 58.6 million m <sup>3</sup> /a
• <b>Overberg: 3 million m<sup>3</sup>/a</b>	• Overberg: 4 million m <sup>3</sup> /a

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### Allocations from WCWSS

- City of Cape Town: 385.9 million m<sup>3</sup>/a
  - Incl. temporary allocation
- West Coast DM
  - Withoogte Misverstand: 18.60 million m<sup>3</sup>/a
  - Swartland Voëlvei: 4.20 million m<sup>3</sup>/a
- Stellenbosch LM: 3.00 million m<sup>3</sup>/a
- Overberg Water: 4.00 million m<sup>3</sup>/a
- Piketberg and PPC: 1.50 million m<sup>3</sup>/a
- Agriculture: 162.3 million m<sup>3</sup>/a
- Total Allocation: 579.5 million m<sup>3</sup>/a**

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### Other Allocations to consider

- Allocations to consider, as they impact on water availability in the WCWSS
  - Paarl from Berg River (run-of-river)
  - Agriculture from Klein Berg River
  - Tulbagh and Wolseley from Klein Berg River
  - 24-Rivers IB from 24-Rivers and Leeu River



### Additional requests

- Licence applications for
  - CCT full allocation of Berg River Dam yield
  - CCT temporary allocation from Theewaterskloof Dam
  - WC DM increase in allocation from Voëlvelei Dam
- Licence applications for agricultural use above capped volume
- Request for additional releases from Voëlvelei Dam for Lower Berg IB



### “Apples and Pears”

- **2013/2014 Water use:** 508.1 million m<sup>3</sup>/a
  - Domestic water use: 338.1 million m<sup>3</sup>/a
  - Agricultural water use: ~ 160.0 million m<sup>3</sup>/a
  - Agricultural water use, capped: 170.0 million m<sup>3</sup>/a
- **Revised Water use:** 504.2 million m<sup>3</sup>/a
  - Domestic water use: 344.2 million m<sup>3</sup>/a
  - Agricultural water use: ~ 140 million m<sup>3</sup>/a
  - Agricultural water use, capped: 160 million m<sup>3</sup>/a



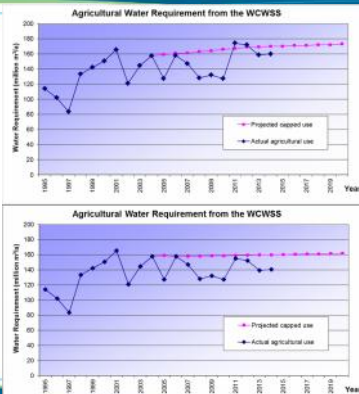
### Agricultural Water Use

WUA, IB	Capped	2011/12	2012/13	2013/14 ***
<b>Berg River Scheme (Voëlvelei Dam &amp; Misverstand Weir)</b>				
Lower Berg IB	18.1	29.07	22.88	
24 Rivers IB	11.5	19.74	19.74	
<b>Riviersonderend / Berg River Scheme (Theewaterskloof Dam, Berg River Dam)</b>				
Zonderend IB	31.5	34.07	31.90	
Overberg Water	4.00 *	3.19	3.17	3.22
Vyeboom IB	13.2	8.92	8.73	
Pump from Theewaterskloof Dam	1.5	1.43	1.43	
Upper Berg IB	58.6	48.02	45.90	
Banhoeck IB	1.8	1.71	1.71	
Wynlands WUA : Stellenbosch District	12.0	11.46	9.60	
Wynlands WUA : Helderberg District	12.1	10.04	9.15	
Wynlands WUA : Eerste River District	3.1	4.09	4.09	
Irrigation surplus	10.4			
<b>Total</b>	<b>173.8</b>	<b>171.74</b>	<b>158.29</b>	<b>160</b>



### Agricultural Water Use (based on dam releases)

- 2012/13:
  - 158.55 million m<sup>3</sup>
- 2013/14:
  - Registered: 178.65 million m<sup>3</sup>
  - Recorded: 95.86 million m<sup>3</sup>
  - Estimated: 160 million m<sup>3</sup>
- Incl. 24-Rivers IB



Agricultural water use: ~ 140 million m<sup>3</sup>/a

### Historical Water Use

Source	Allocation	10/11	11/12	12/13	13/14	2011 – 2014
<b>Bulk water CCT</b>	<b>398 700 000</b>	<b>336 271 703</b>	<b>330 040 938</b>	<b>320 921 722</b>	<b>314 773 795</b>	<b>-2.2%</b>
Bulk water CCT, dam sources (approximated)	12 800 000	10 000 000	8 000 000	8 000 000	8 000 000	
<b>Bulk water CCT, WCWSS</b>	<b>385 900 000</b>	<b>326 271 703</b>	<b>322 040 938</b>	<b>312 921 722</b>	<b>306 773 795</b>	<b>-2.0%</b>
Bulk water Witboegte	17 440 000	16 705 674	17 525 046	18 692 770	20 363 425	6.8%
Bulk water Swartland	4 200 000	6 636 187	6 592 732	6 595 709	6 497 447	-0.7%
Bulk water Stellenbosch	3 000 000	3 290 000	2 930 000	3 000 000	4 469 199	10.8%
<b>Urban total from WCWSS</b>	<b>410 540 000</b>	<b>352 903 564</b>	<b>349 088 716</b>	<b>341 210 201</b>	<b>338 103 866</b>	<b>-1.4%</b>

Overberg Water, Piketberg, PPC ??



