



2024

11th Southern African Water Loss Summit

Supported by:
The International Water Association
Water Loss Specialist Group



KEY WATER DEMAND MANAGEMENT INITIATIVES BY RAND WATER

**Presented by
Mamorena Ramosoeu**

Supporting organisations:



Contents



RAND WATER

Purpose of the Presentation

Background

Water Demand and Supply Facts

Non-Revenue Water for Top 5 Customers

Key WDM Initiatives by Rand Water

Challenges and Planned Activities

Conclusions

Purpose of the Presentation

To provide an overview of initiatives RW is implementing to actively influence the demand by Rand Water customers to remain within the abstraction limit of **1 600 Mm³/annum**, as set by the DWS until Phase 2 of the Lesotho Highlands Scheme comes into operation (Anticipated completion by 2028).

Background

- Demand in the Rand Water Area of Supply (RoS) has been on an upward trend over the past few years.
- This is a result of population growth, industrialization, and non-revenue water (NRW).
- As a result, Rand Water (RW) has exceeded the license allocation (The Department of Water and Sanitation (DWS) has approved an abstraction limit of **1 600 Million Mm³/a (4 384 Mℓ/d)** for Rand Water from the Integrated Vaal River System (IVRS).
- To influence this demand, RW as the major user of the IVRS, had to develop various strategies that would assist and guide customers to reduce their demand so RW can comply with the abstraction limit.

Water Demand and Supply Facts

➤ Raw water abstraction license: 1 600Mm³/a (4 384 Mℓ/d)

➤ **Increasing demand:** Actual abstraction over the past 5 years

✓ 2018/19 : 1 668 Mm³/a,

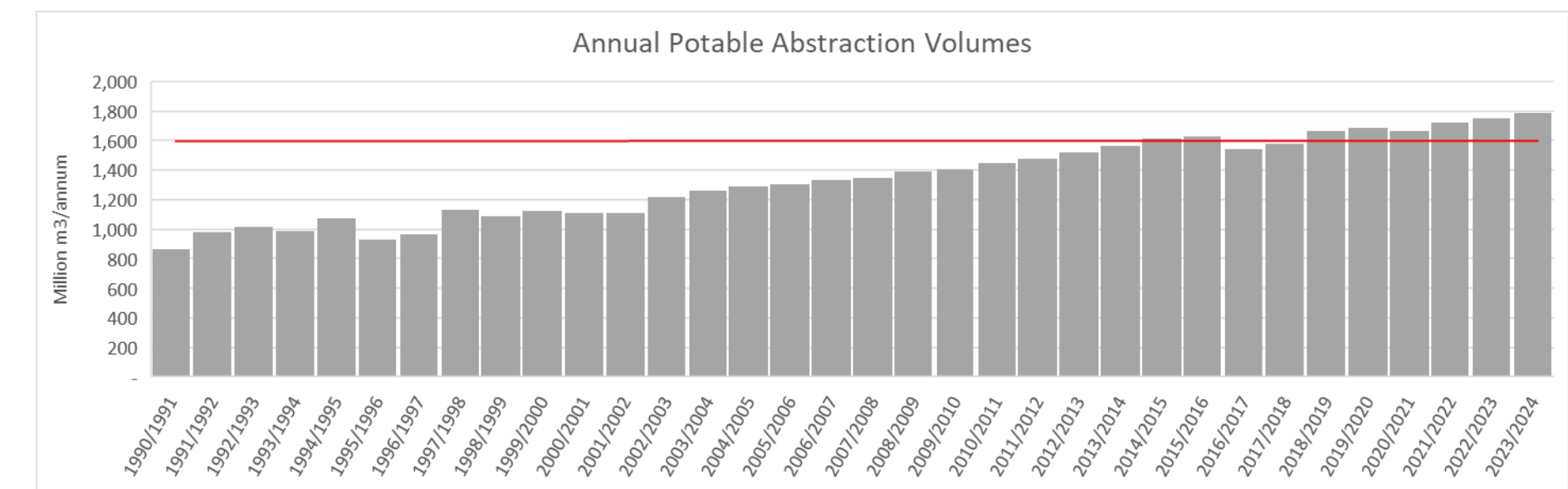
✓ 2019/20 : 1 691 Mm³/a

✓ 2020/21 : 1 664 Mm³/a

✓ 2021/22 : 1 727 Mm³/a

✓ 2022/23 : 1 755 Mm³/a

✓ 2023/24 : 1 793 Mm³/a (4 915 Mℓ/d)



➤ Granted temporary license (2022): 1 800Mm³/a (4 931 Mℓ/d), expired in September 2023.

Water Demand and Supply Facts (cont.)

- **Inefficiencies in the entire value chain**
 - ✓ Internal current losses:
Total NRW @ 7.65% (5.68% real losses)
 - ✓ Losses within RW area of supply:
Total NRW @ 42.5% - (National average is @ 47.4%)
- **Lesotho Highlands Water Project Phase 2 delayed**
 - ✓ It is anticipated that it will come into operation in 2028

Non-Revenue Water (%) – Top 5 Customers

Municipality	Jun-21	Jun-22	Jun-23
	NRW %		
City of Johannesburg	44,2%	44,8%	48,2%
City of Tshwane	34,0%	32,6%	32,6%
City of Ekurhuleni	35,5%	35,8%	30,9%
Emfuleni	72,6%	75,7%	73,9%
Midvaal	38,4%	36,7%	36,2%

Key WDM Initiatives at Rand Water

- Project 1600 is a key initiative undertaken by Rand Water for its Area of Supply (AoS).
- Project 1600 sets out to:
 - ✓ Equitably apportion the **1 600 Mm³/annum** to all its direct and municipal customers based on pre-determined and confirmed norms and guidelines. *The Human Settlement Planning and Design Guideline published by the Dept. of Human Settlement was utilized for this purpose.*
 - ✓ *Once apportionments are agreed to with the municipalities, they become the ‘**License Target**’ against which actual consumption is measured monthly.*
 - ✓ To fulfill DWS’ stipulation in 2012, that any new abstraction application from Rand Water should provide specific plans to manage and reduce the demand.

Key WDM Initiatives at Rand Water (cont.)

Customers	License target	Supply	Variance
Direct users	269	126	- 143
CoJ	1 356	1 720	364
CoE	1 022	989	- 33
CoT	667	776	109
EMF	239	296	57
Mogale	93	95	2
Metsimaholo	51	43	- 8
RLM	68	87	19
Govan Mbeki	106	89	- 17
Mid Vaal	28	34	6
Merafong	86	65	- 21
Rand West	91	70	- 21
Lesedi	23	23	0
Ngwathe	7	8	1
Victor Khanye	17	19	2
RBA	10	13	3
Madibeng	8	14	6
Thembisile Hani	31	32	1
Grand Total	4 172	4 500	328

- ✓ These apportionments, once agreed to with the municipalities, became the ‘**License Target**’ against which their actual consumption is measured on a monthly basis.

Key WDM Initiatives at Rand Water (cont.)

Objectives of Project 1600

- ✓ To improve the efficiency of water used by municipalities and the end consumer for Rand Water to comply with the abstraction limit of **1 600 Million Mm³/a** until LHS Phase 2 comes into operation.

Key WDM Initiatives at Rand Water (cont.)

➤ WUEI Model

- ✓ In-house developed tool that equitably allocates targets across all customers within RW area of supply.
- ✓ Ratio of actual consumption to normal demand is defined as water use efficiency index(WUEI) and colour graded as follows:

$$\text{WUEI} = \frac{\text{Actual}}{\text{Normal}}$$

WUEI_YTD		
	0.000 - 0.700	Supply Constraint
	0.701 - 0.900	High Efficiency
	0.901 - 1.100	Normal Efficiency
	1.101 - 1.190	Low, Under License
	1.191 - 1.500	Low, Over license
	1.501 - 2.500	No Efficiency
	2.501 - 30.000	No Data Error?

Key WDM Initiatives at Rand Water (cont.)

i. Setting of fair and equitable supply targets

- Determined efficiency-based supply targets for each municipal bulk supply meter and communicated this to all customers in 2017.

ii. Monitoring and communication of performance against licensed targets

- Monthly – performance of municipal bulk meters.
- Quarterly – Overall performance of municipalities and priority areas in Quarterly Project 1600 Forum.
- Annually – End-of-year review communicated to all customers.

iii. Defining focus areas for WDM interventions

- Areas of concern that should be prioritized are discussed with municipalities at individual sessions and during the quarterly forum.

Key WDM Initiatives at Rand Water (cont.)

iv. Review of water demand interventions by municipalities and monitoring of progress

- Review of municipalities' interventions, in relation to the priority areas identified
- Engage municipalities in taking a holistic approach to water demand management
- Monitor the effectiveness of interventions

v. Quarterly Project 1600 Forum

- The forum sits quarterly, and it is a platform where progress, challenges, and all WDM issues are discussed. Membership: DWS, SALGA, municipalities, consultants

Key WDM Initiatives at Rand Water (cont.)

vi. Water Demand curtailments

➤ The objectives of the water demand curtailments:

- To reduce/ curb the inefficient portion of the customer demand, without infringing on the basic rights of municipal customers for water.

Municipality	NRW (%) obtained from DWS	Reduction requirement based on WUE license/supply target	Stages and period of implementation
Stage 1 municipalities – implementation for 6 months			
Customer 1	43%	10%	Stage 1, for 6 months,
Customer 2	32%	10%	Stage 1, for 6 months
Customer 3	34%	15%	Stage 1, for 6 months
Customer 4	36%	15%	Stage 1, for 6 months
Customer 5	44%	30%	Stage 1, for 6 months
Customer 6	34%	5%	Stage 1, for 6 months
Stage 2 municipalities – implementation for 12 months			
Customer 1	65%	10%	Stage 2, for 12 months
Customer 2	68%	10%	Stage 2, for 12 months
Customer 3	No data	30%	Stage 2, for 12 months
Customer 4	69%	5%	Stage 2, for 12 months

Key WDM Initiatives at Rand Water (cont.)

vii. Moratorium on new connections

- New connections are temporarily prohibited by Rand Water to municipalities – but municipalities still approve new connections in their network.

viii. Daily engagements with Metros

- Due to the current water challenges experienced throughout RoS, meetings are held daily with Metros and DWS to explore various ways of minimizing the demand and its impact thereof.
- Water restrictions of high consuming meters are implemented to curb demand – system (valves) not designed to.

Challenges

- Growing municipal demand (*existing consumer inefficiencies, new developments & increased informal settlements, etc.*).
- Increasing NRW (*Aging infrastructure, illegal connections, irrecoverable revenue, etc.*).
- Abstraction license limitations.
- High water use inefficiencies in the municipal sector.
- Consumer behavior not changing.
- Valve damages over a long period.
- Minimum influence on municipalities' for NRW strategies implementation.
- Delayed project implementation and institutional challenges.

Planned Activities to Manage Water Demand

i. Automated control valves

- Reduction of unnecessary demand by municipalities through the installation of pressure-reducing valves (PRVs) at optimal locations in the municipal networks to achieve some crucial objectives.

Customer	No of priority bulk meter supply points	Reduction potential in MI/d (revised for 2019)
City of Ekurhuleni	7	47
City of Johannesburg	24	233
City of Tshwane	13	108
Emfuleni	7	40
Govan Mbeki	1	0
Mogale City	1	1
Rustenburg	2	17
Thembisile Hani	1	0
Victor Khanye	1	7
Grand Total	57	453

Number of priority meter points and expected savings

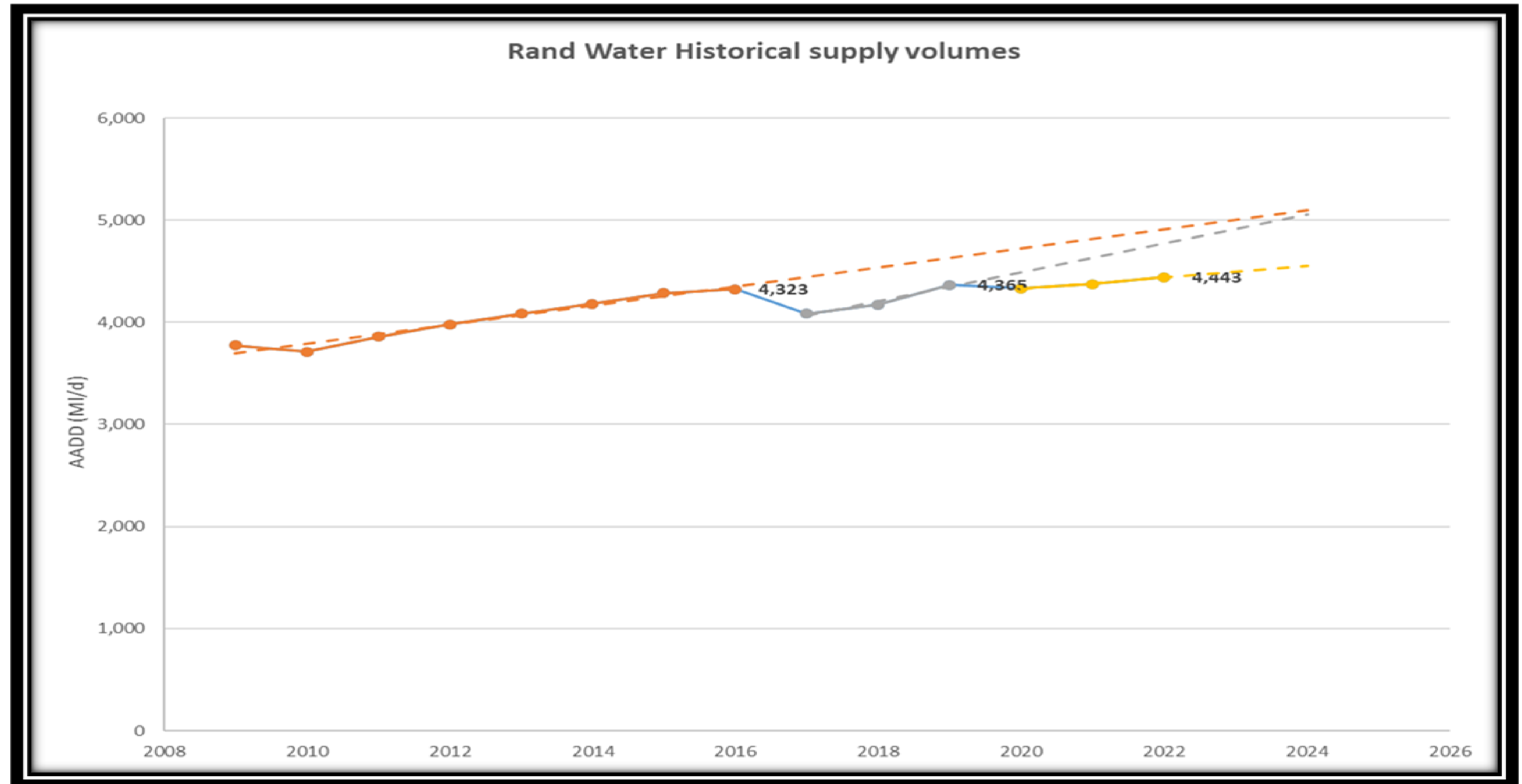
Planned Activities to Manage Water Demand (cont.)

i. Section 63

- Directive to Rand Water to be an Implementing Agent for the Vaal River System Intervention and Section 63 Of Water Services Act, act 108 of 1997 intervention
- Entails taking over water services function at Emfuleni Local Municipality to undertake management, operations, and maintenance of the water and sanitation infrastructure, refurbishment, upgrade for the reticulation system and bulk water services infrastructure, water conservation water demand management (WCWDM) and capacitation of Metsi-a-Lekoa”

Planned Activities to Manage Water Demand (cont.)

Impact of interventions



Conclusion

- South Africa is a water-scarce country. Unfortunately, the water usage does not reflect that as our abstraction volumes are on an upward trend and higher than the limits set by the Department of Water and Sanitation.
- Taking into consideration the fact that there will be the same amount of water available to service the growing demand until 2028; the need for escalated water demand management by all sectors cannot be emphasized enough.

Thank you

Finding New Ways

