

UNITED NATIONS OFFICE AT VIENNA  
OFFICE FOR OUTER SPACE AFFAIRS

“Water for the World: Space Solutions for  
Water Management”

“Water, sanitation and health:  
needs of developing countries”

Hannes Buckle  
Graz, Austria

13 September 2004

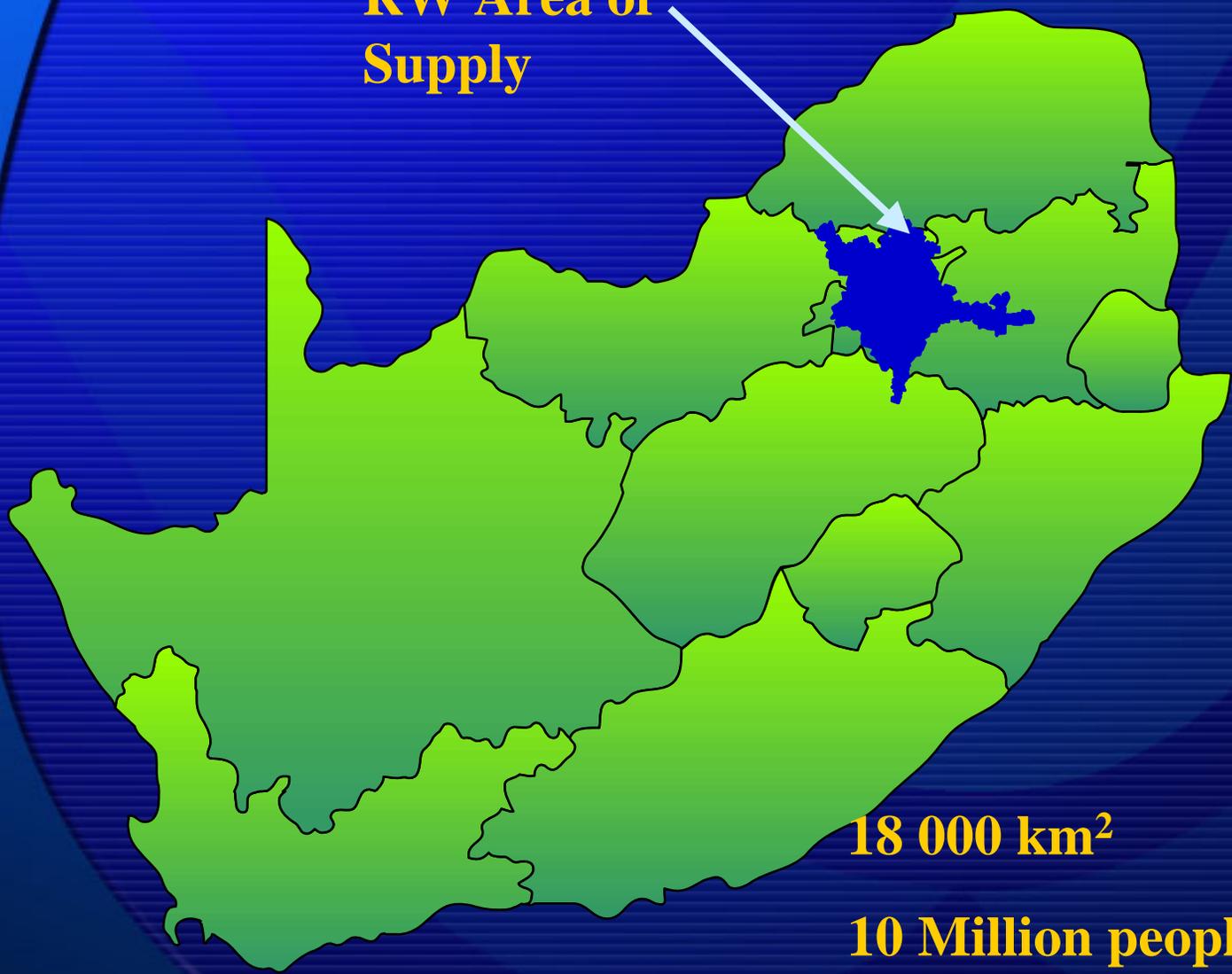


RAND WATER



The United Nations Centre for Human Settlements (Habitat)

**RW Area of  
Supply**



**18 000 km<sup>2</sup>**

**10 Million people**

**3 800 MI water demand per day**



**RAND WATER**

# Rand Water

- **State owned Public Utility**
- **Own Board of Directors**
- **Full ownership of own assets**
- **Supply potable water to 13 municipalities and 3 metropolitan municipalities**
- **World class quality**



# Rand Water area of supply

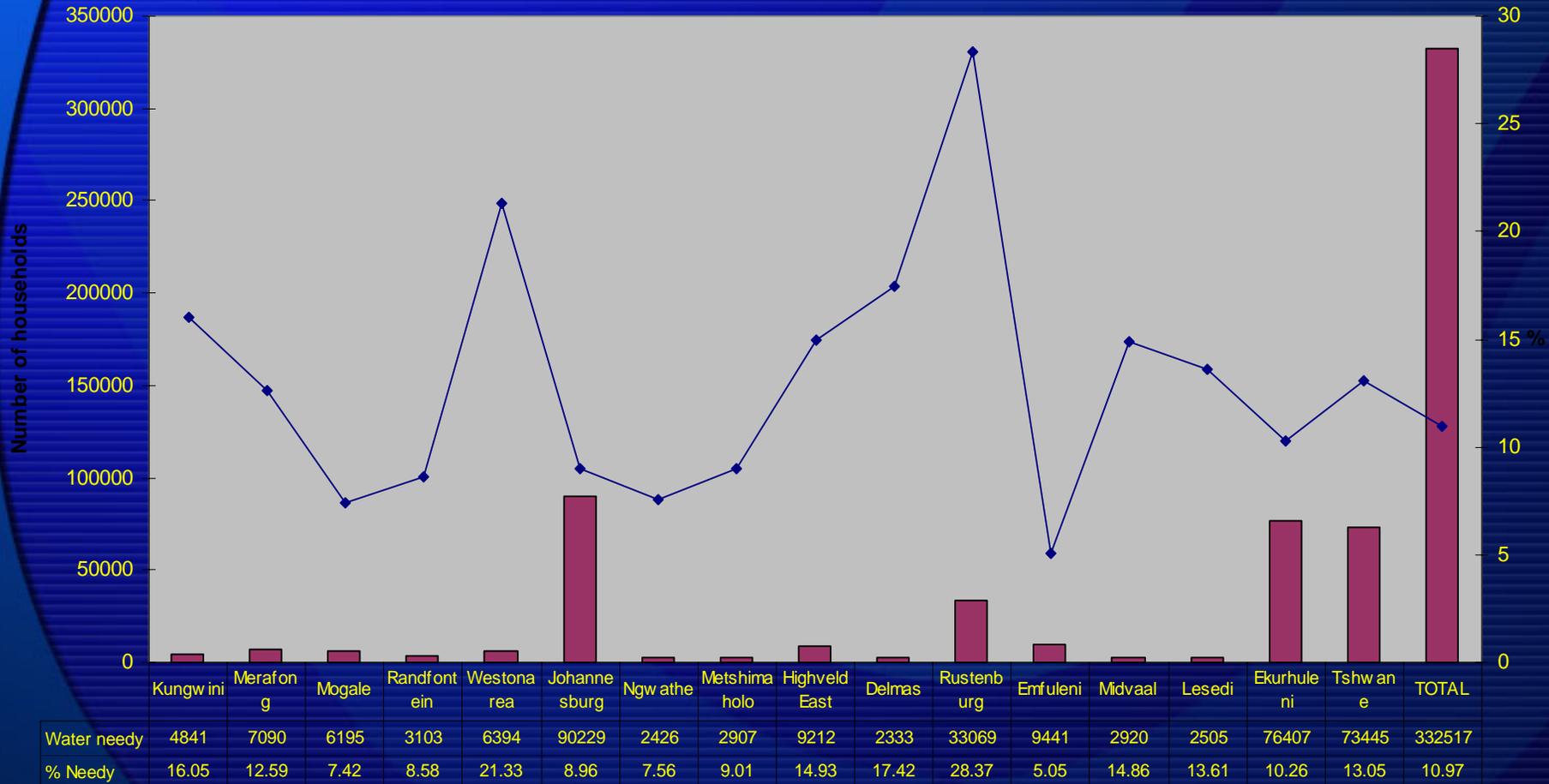
- 27% water loss (wastage) in RW AOS or  
US\$442 000/day
- 25% inefficient water use
- Total 52% or 721 million kilolitres per annum

**If we do not stop this, we are going to build the next augmentation scheme**



# WATER NEEDED: HOUSEHOLDS

(SSA, 2003)

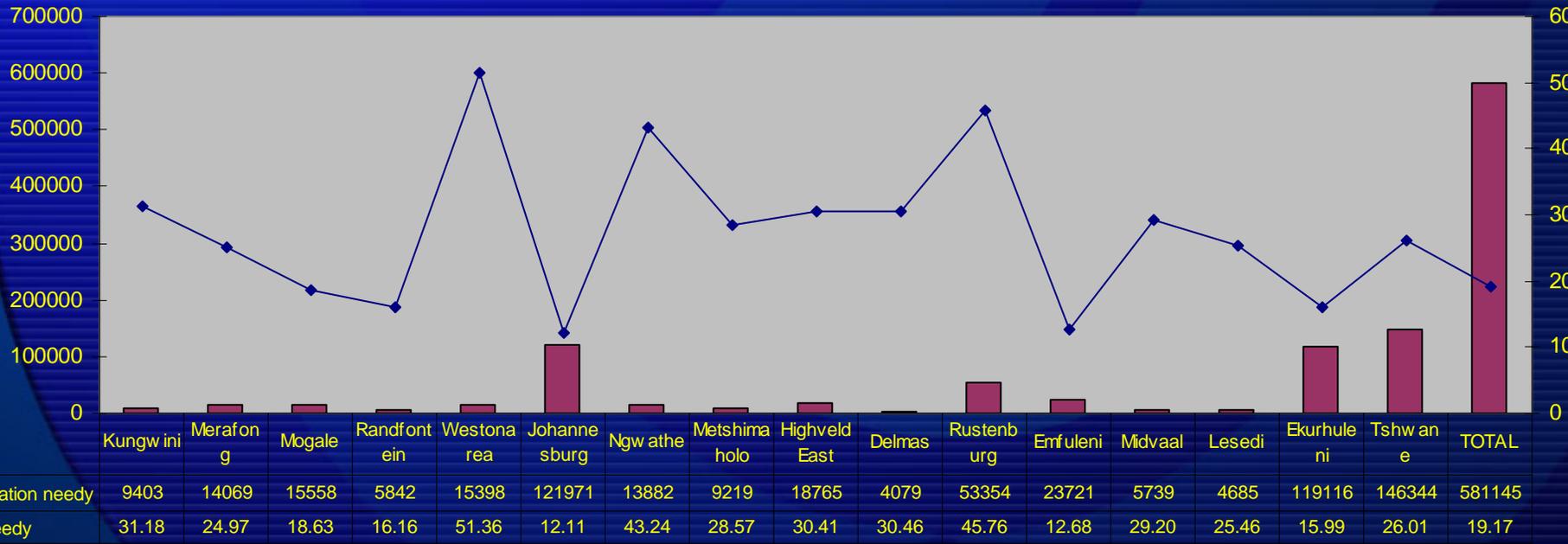


**Major challenges to upgrade services of estimated 332 517 households (About one Million people)**



# SANITATION NEEDY: HOUSEHOLDS

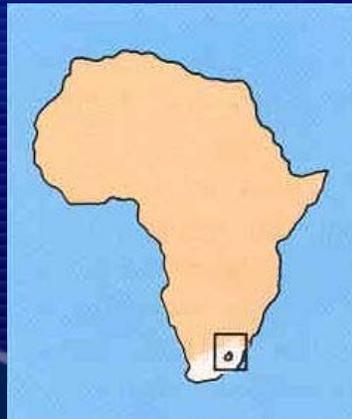
(SSA, 2003)



# Perceptions



# We are under the impression we have lots of water

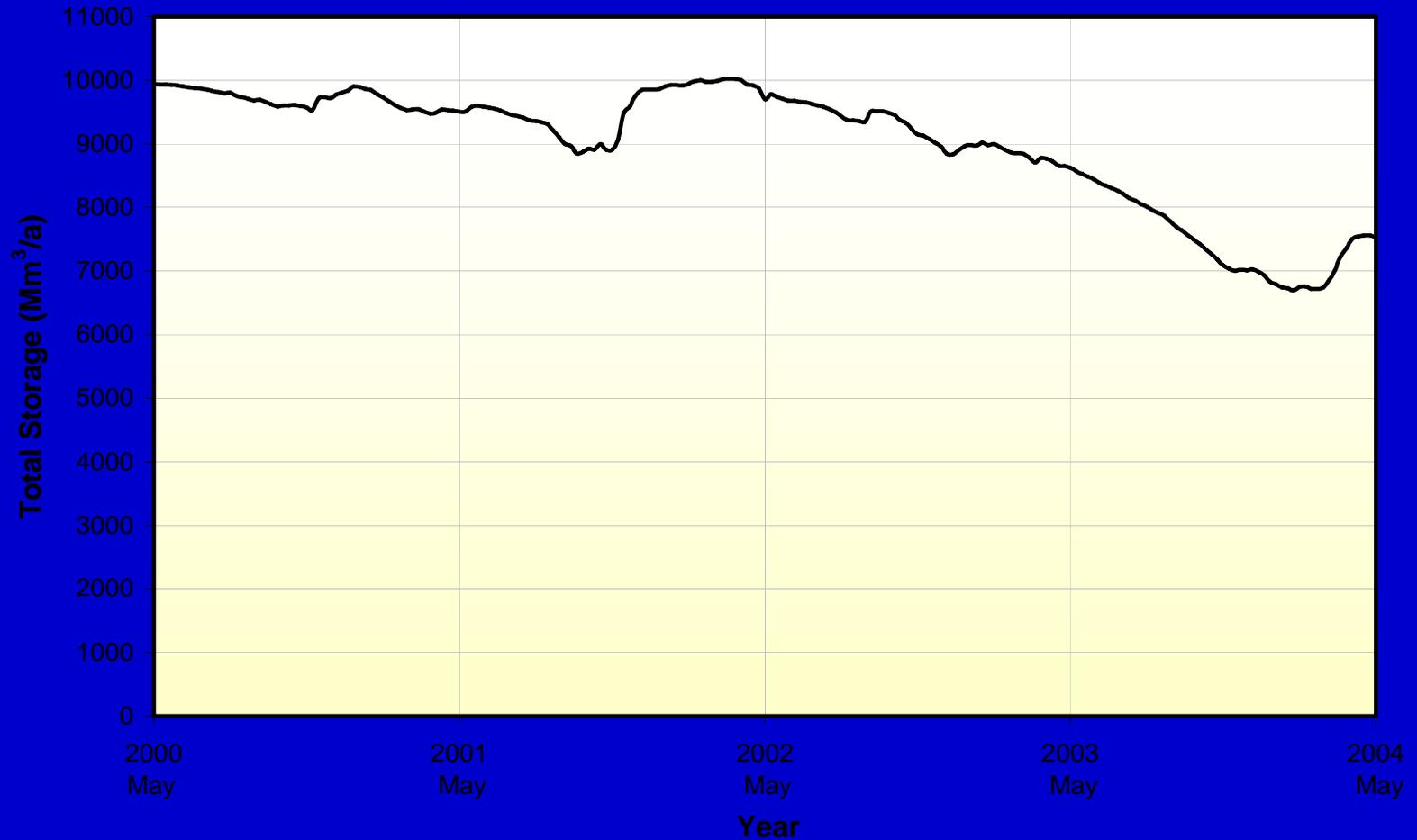


We think we live in a forest



# Real truth

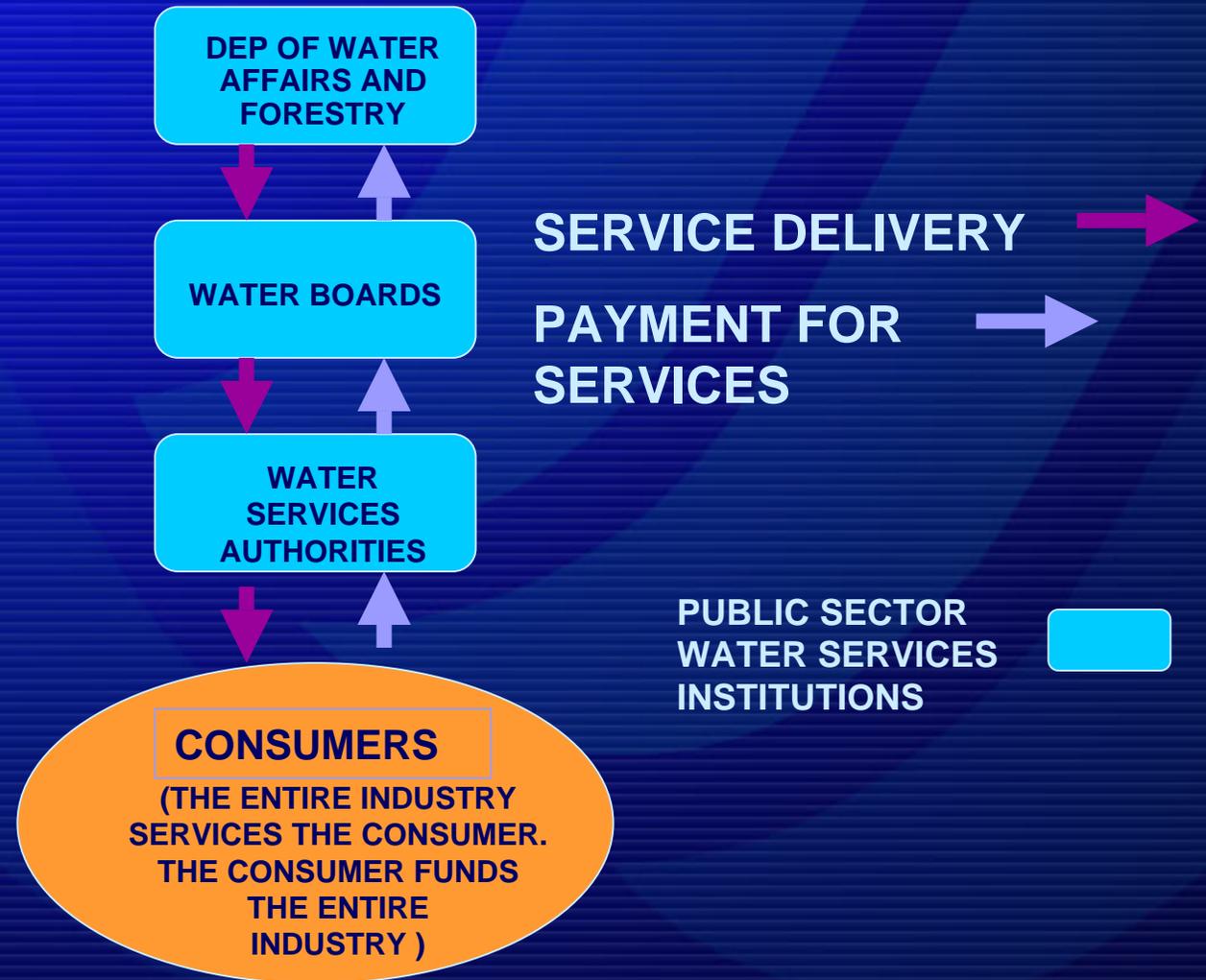
Total Vaal River system storage (from May 2000)



**There is no pollution**



# The Water Supply Industry Institutional Model







**RAND WATER**

FRANCISKA STRAAT





RAND WATER



# Concept of Water Cycle Management

A strategic approach towards:

**equitable, efficient and sustainable**

management of water resources and services

**HOLISTIC**



# Water Cycle Management Strategies



# Water Demand Management

- Technical measures
- Financial Measures
- Policy/legislation
- Awareness and education

**The above MUST be**

- Ongoing
- Integrated



# What is lacking

- **Knowledge** of the **issues on WDM**
- **Vision**
- **Strategies/Goals/Objectives that can be implemented**
- **Council and Management assistance for implementation**
- **Integration of effort**
- **Accountability** of Councils towards good governance?





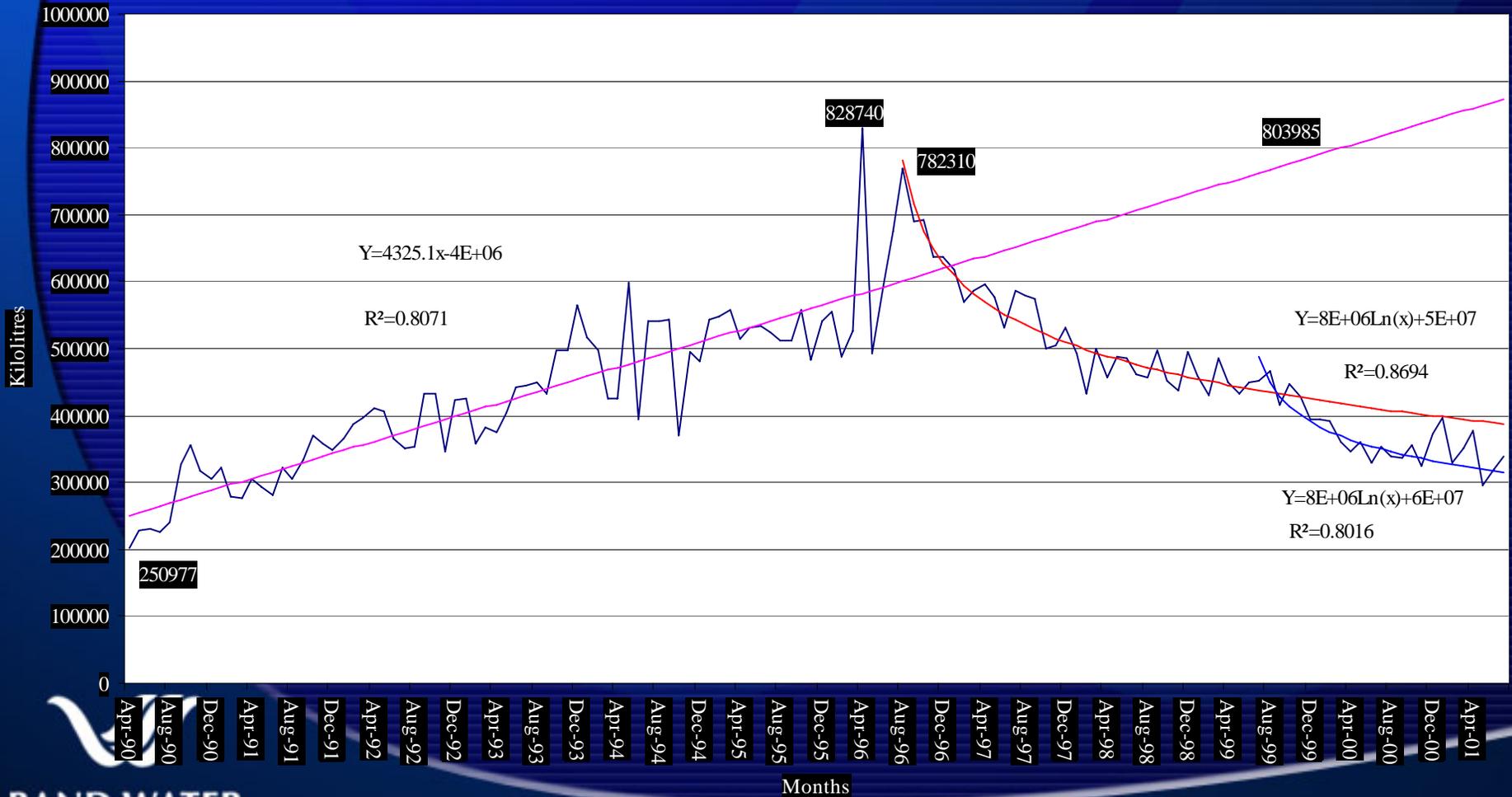
# Some facts

- **Free water**
  - Approximately 3,5 million families in Gauteng
  - Need 21 million kl to supply 6kl free water per month
  - Cost equals US\$8.1 million per month
  - If 37% of wastage and inefficient use is curbed, it will fund the free water
- **Municipal capacity**



# No water engineer left

Kagiso Consumption



# Bureau for MIS

**If we do not measure, we do not know**



# Bureau for MIS

- Centralise information
- Expertise available and kept
- Economy of scale
- Maintenance ease
- Municipal managers can manage

**TO DO EFFECTIVE WDM**



# Bureau deliverables

- **Activity based costing**
- **Job card based and prioritised maintenance**
- **Customer complaint centre**





**Understand your water account/Verstaan u waterrekening**

Account No Rekening Nr	00357680007	Date of Account Datum van Rekening	30/05/1997	Date of Reading Lesingsdatum	06/05/1997
Name/Naam	GP LE ROUX SELKIRK STREET 45			Erf Area	
Property Address Eiendom Adres				Erf Nr	
Meter No Meter Nr	Present Reading Huidige Lesing	Previous Reading Vorige Lesing	Consumption Verbruik	Days Dae	kl/Day kl/Dag
30369	5,088	5,061	27	30	0,90
Consumption (kl) Verbruik (kl)	Cost Koste	Assurance of Supply Versekering van Lewering		VAT BTW	Total Totaal
27	R 38,00	R 40,00		14%	R 88,92

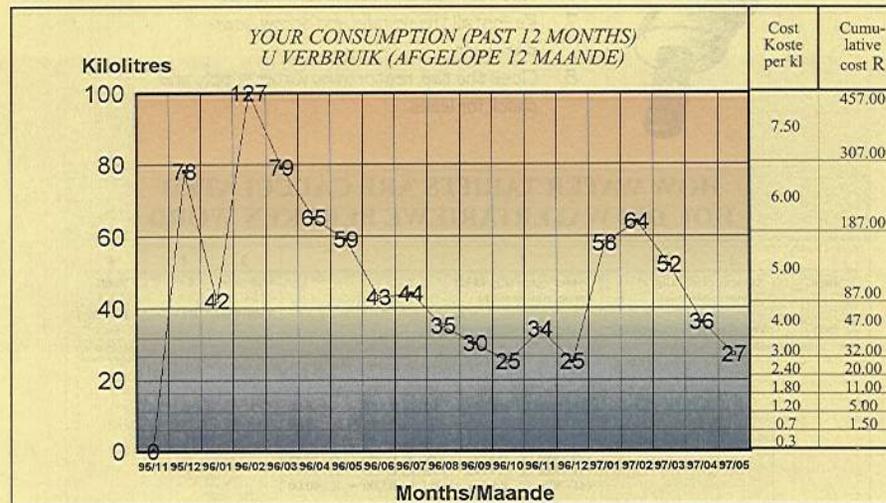
**Notice Board**



Kennisgewingbord

INSULATE YOUR HOT WATER CYLINDER AND HOT WATER PIPES THIS WINTER TO SAVE WATER AND ELECTRICITY. HOTLINE 70 11 11

ISOLEER U WARMWATER-SILINDER EN WARMWATER PYPE HIERDIE WINTER OM WATER EN KRAG TE BESPAAR. NAVRAE 70 11 11



# Top Consumers

## February 2001 Top 50 Consumers

Consumer:	Cons	Date Read:	Township:	Street:	StrNo:	Stand
EARLYBIRD FARMS (PTY) LTD	61140	02/02/2001	CLAYVILLE EXT 4	INDUSTRY	27	416 352
MIDRAND M.L.C.	46910	02/02/2001	CLAYVILLE EXT 22		0	11111 12
CONSOL (PTY) LTD	10509	02/02/2001	CLAYVILLE EXT 11	AXLE	27	1261 91
COMMERCIAL UNION LIFE ASS	7887	02/02/2001	CLAYVILLE EXT 3	PREMIER STREET	30	971 34
SA MUTUAL LIFE ASS SOC	6848	02/02/2001	CLAYVILLE EXT 14		0	1250 88
MINE OFF PENS FUND	5830	09/02/2001	RANDJESPAK EXT 52	NEW	402	120 28
EARLYBIRD FARMS (PTY) LTD	4546	02/02/2001	CLAYVILLE EXT 4	INDUSTRY	27	416 352
LERIX INV. PTY LTD	3609	02/02/2001	NOORDWYK EXT 20		0	1624 12
MIDRAND M.L.C.	3564	02/02/2001	CLAYVILLE		0	983 86
CLOVER SA BPK	3458	02/02/2001	CLAYVILLE EXT 11	AXLE	25	1266 91
PRIME INV 210 (PTY) LTD	3098	09/02/2001	RANDJESPAK EXT 7		0	9999 27
NORCROSS S A PTY LTD	3054	02/02/2001	CLAYVILLE EXT 12		0	981 92
WATERFALL VILLAGE LTD	2699	06/02/2001	VORNA VALLEY EXT 43	LANGERVELDT	161	1956 12
MIDRAND HIGH SCHOOL	2676	06/02/2001	ERAND A/H	VAN HEERDEN AVENUE	344	344 43
PRIMEGRO PROPERTIES LIMIT	2375	07/02/2001	HALFWAY HOUSE EXT 7	TONETTI STREET	162	342 18
T F M (PTY) LTD	2314	02/02/2001	CLAYVILLE EXT 4	INDUSTRY	33	411 35
TRANSNET RETIREMENT FUNDS	2273	02/02/2001	CLAYVILLE EXT 14	PORCELAIN	169	1250 88
CREDIT SAVE (PTY) LTD	2236	09/02/2001	RANDJESPAK EXT 62	SIXTEENTH ROAD	59	136 28
RUETLI PROP (PTY) LTD	2006	08/02/2001	BOTHASFONTEIN 408 JR		0	31 71
B.A.S.F. SOUTH AFRICA	1883	09/02/2001	GLEN AUSTIN A/H	SIXTEENTH ROAD	852	229 49
CARSON PRODUCTS SA PTY LT	1698	09/02/2001	RANDJESPAK EXT 6	FIFTEENTH	427	86 27

# Average Cost per activity

## Monthly/YTD Detailed Job costing per Area

Wednesday, April 03, 2002

Each Total Cost Average Rand	Type of Repair	Year	Jun-2001	Jul-2001	Aug-2001	Total
		BURST PIPE		13 6,783 522	5 1,418 284	5 498 100
	CLEAN METER			4 1,349 337	5 1,549 310	9 2,898 322
	REMOVE METER - NON PAYMEN		41 5,469 133	8 2,290 286		49 7,758 158
	REPLACE METER BOX		3 809 270	1 263 263	2 476 238	6 1,548 258
	REPLACE STOPCOCK			5 1,669 334	4 678 170	9 2,348 261
	<b>Total</b>		57 13,060.60 229.13	23 6,988.30 303.84	16 3,201.57 200.10	96 23,250.47 242.19

# Domestic consumption and water balance per zone

## Consumer Water Consumption per Zone for Period 1

Wednesday, April 03, 2002

Zone Description	January	February	March	April	May	June	July	Aug	Sept	October	Nov
	107,217	179,391	199,782	147,454	128,260	107,032	121,823	110,190	104,605	133,452	146,288
Zone 1	19,645	34,164	33,572	25,413	19,033	14,779	13,491	14,059	14,882	23,192	24,194
Zone 2	18,667	21,380	21,216	17,684	14,570	12,335	11,887	12,391	12,865	17,001	19,108
Zone 3	52,298	72,246	69,138	56,423	45,682	35,488	39,798	34,704	35,329	45,750	48,432
<b>Grand Totals</b>	<b>197,827</b>	<b>307,180</b>	<b>323,708</b>	<b>246,974</b>	<b>207,545</b>	<b>169,635</b>	<b>186,999</b>	<b>171,345</b>	<b>167,681</b>	<b>219,395</b>	<b>238,021</b>

## Water Balance per zone for periods

Wednesday, April 03, 2002

Type of Consumer	November (Period 1)	December (Period 1)	January (Period 2)	February (Period 2)
	0.00 kld	0.00 kld	0.00 kld	0.00 kld
CONSUM	146,287.64 kld	149,932.74 kld	150,896.27 kld	148,969.27 kld
<b>Zone 1</b>				
BULK	27,929.71 kld	27,780.23 kld	29,707.57 kld	26,717.28 kld
CONSUM	24,193.60 kld	25,352.65 kld	27,318.30 kld	25,852.79 kld
<b>Zone 2</b>				
BULK	19,131.57 kld	22,149.17 kld	26,526.06 kld	24,623.17 kld
CONSUM	19,107.68 kld	21,146.12 kld	20,867.42 kld	19,067.97 kld
<b>Zone 3</b>				
BULK	54,083.71 kld	53,093.34 kld	62,102.57 kld	66,674.77 kld
CONSUM	48,432.17 kld	55,596.55 kld	55,926.93 kld	57,389.89 kld

# Water Meter Management

## Meter Older than period Selected

14 November 2001

Page Number: 1

Township:

Install Date	Street Name	Str No	Stand	Portion	Unit	Meter No	Size	Digits	Years Old
17/02/1994	MODDERFONTEIN	17	102	0	1	851	0	4	7.75
12/05/1993	MODDERFONTEIN	60	43	0	1	567	0	4	8.52
19/05/1994	RIDGE ROAD	5	5	0	1	923	0	4	7.50
21/04/1993	TRICHARDT CRESCENT	12	58	0	1	200	0	4	8.57

Number of meters =

Township:

Install Date	Street Name	Str No	Stand	Portion	Unit	Meter No	Size	Digits	Years Old
30/06/1994	MALTEES	11	11	0	1	347	0	4	7.38
09/03/1994	MALTEES	5	5	0	1	291	0	4	7.69
20/05/1994	WEST ROAD	37	37	0	1	041	0	4	7.49
01/09/1993	WEST ROAD	38	38	0	1	054	0	4	8.21
07/10/1993	WEST STREET	36	36	0	1	271	0	4	8.11
28/07/1994	WORSHOND CIRCLE	25	25	0	1	349	0	4	7.30
12/02/1993	WORSHOND CIRCLE	26	26	0	1	073	0	4	8.76

Number of meters =

# Rand Water Water Loss Project



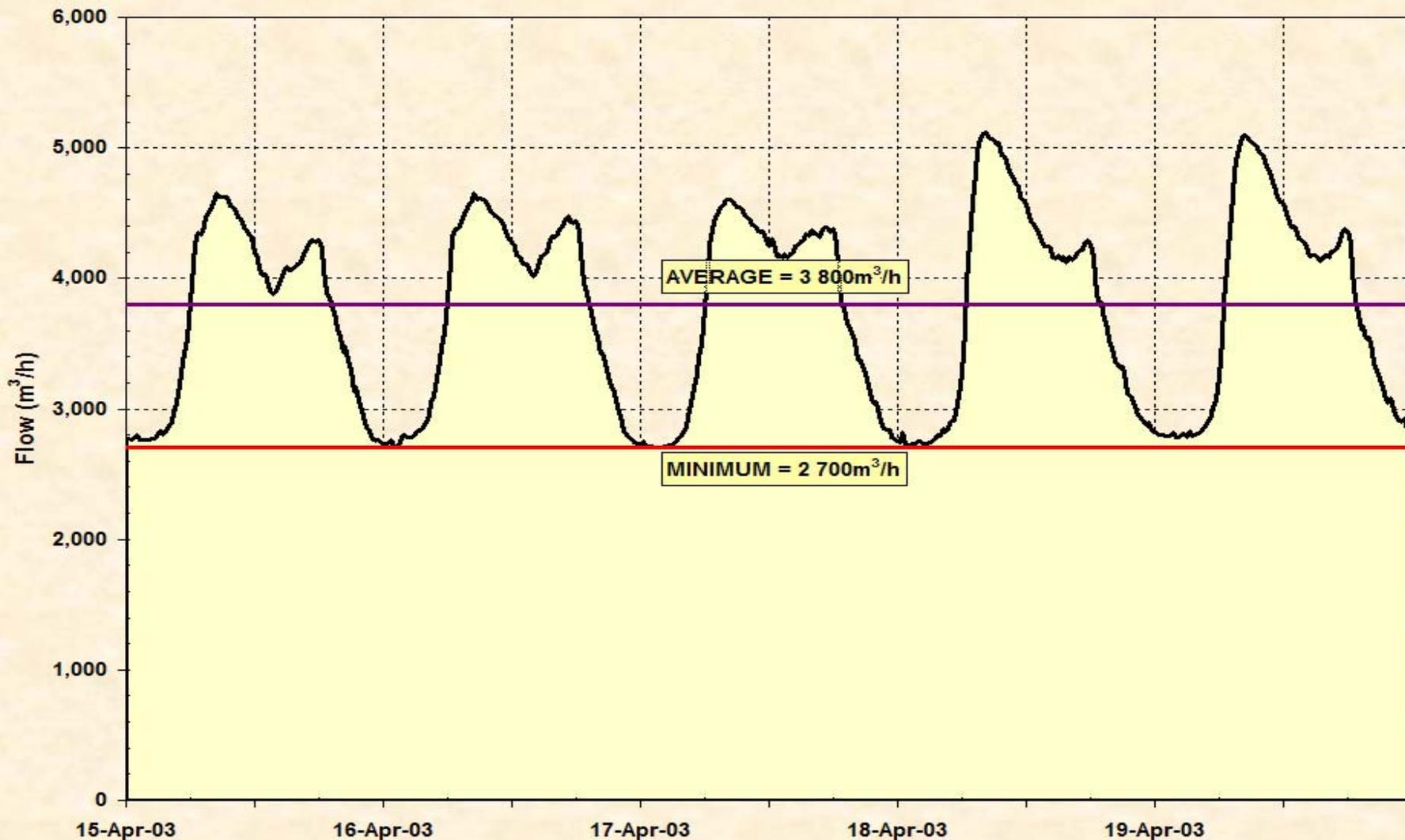
RAND WATER

# Pressure Management

(Not the solution!)



# East Rand Township Minimum Night Flow







# Pressure management on the MNF

- Municipality can save US\$1.92 million/a with a R0.77 million expense – **payback period of 5 months**
- Municipality cannot fund same
- Municipality cannot borrow funds to implement



Annual Savings = 5 000 000 m<sup>3</sup>/year



# Knock-on effect

- That MNF is part of the driving force of US\$**15.4 million** now being spent on infrastructure upgrading and extensions to the water care works



# Regional Strategy in WDM

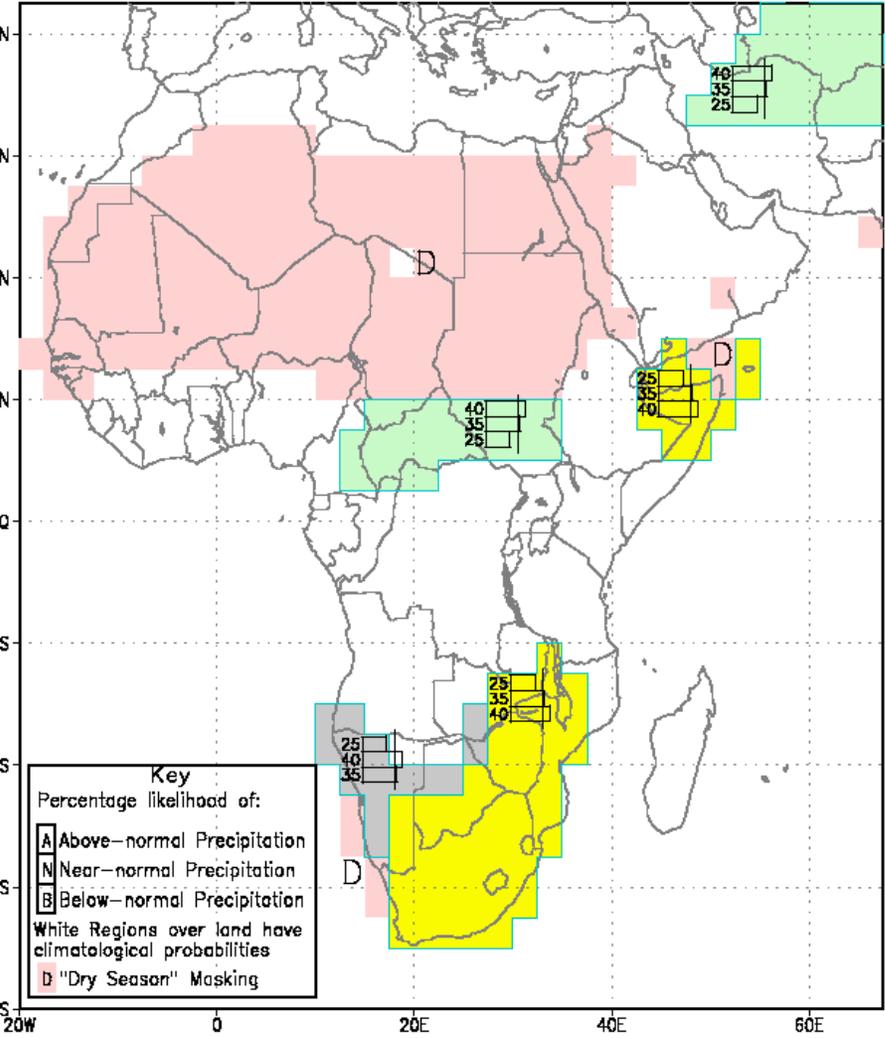
## Difficulties to overcome

- Political wing makes decisions
- Demarcation
- Loss of expertise
- Finance
- Revenue loss

**Integration of efforts in WDM needed**

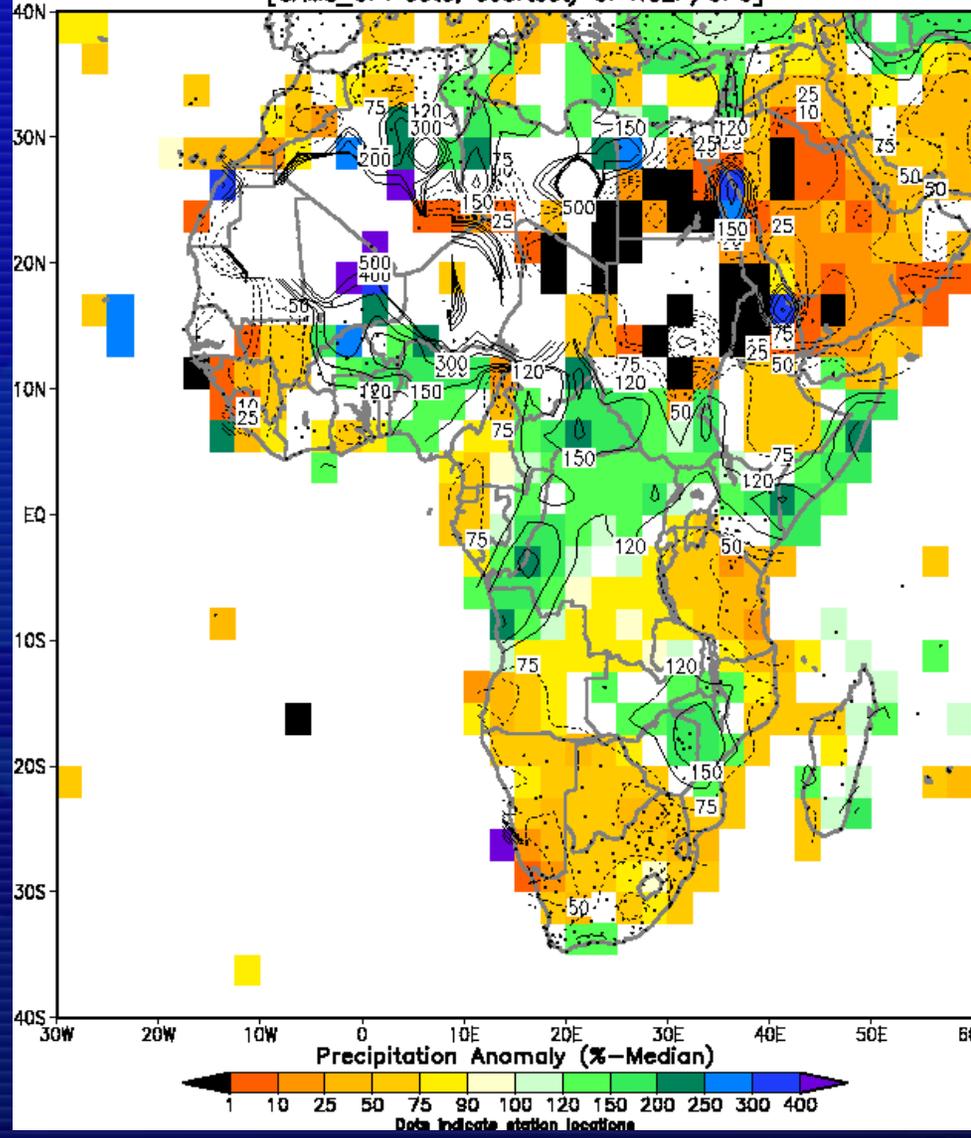


# IRI Multi-Model Probability Forecast for Precipitation February-March-April 2003 made November 2002

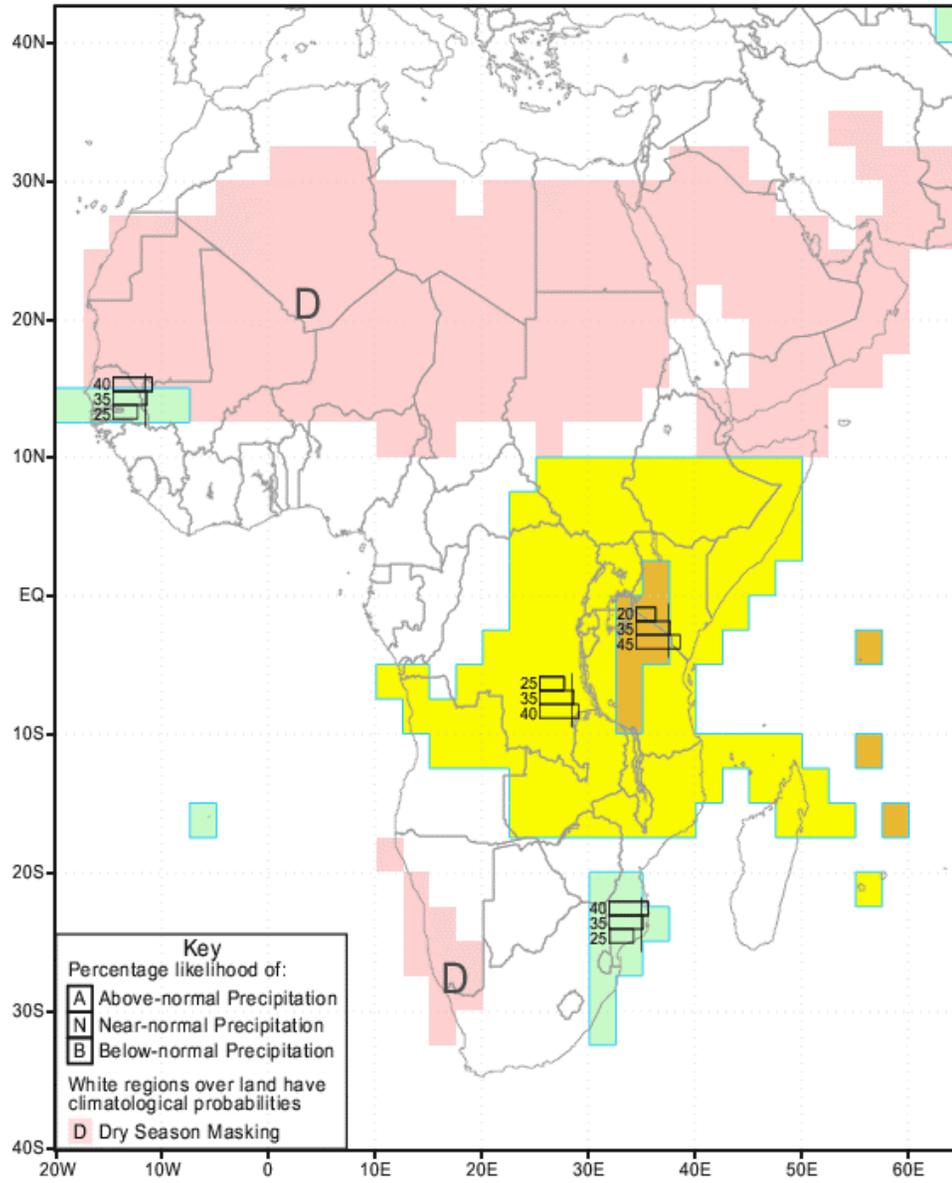


# Observed Precipit. Anomaly FMA 2003

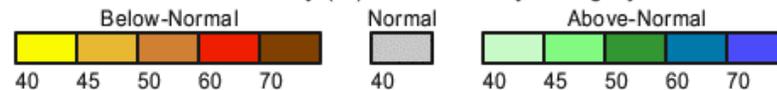
Shaded ONLY for "ABOVE-Normal" & "BELOW-Normal"  
 [CAMS\_OPI data, courtesy of NCEP/CPC]



# IRI Multi-Model Probability Forecast for Precipitation for October-November-December 2004, Issued August 2004



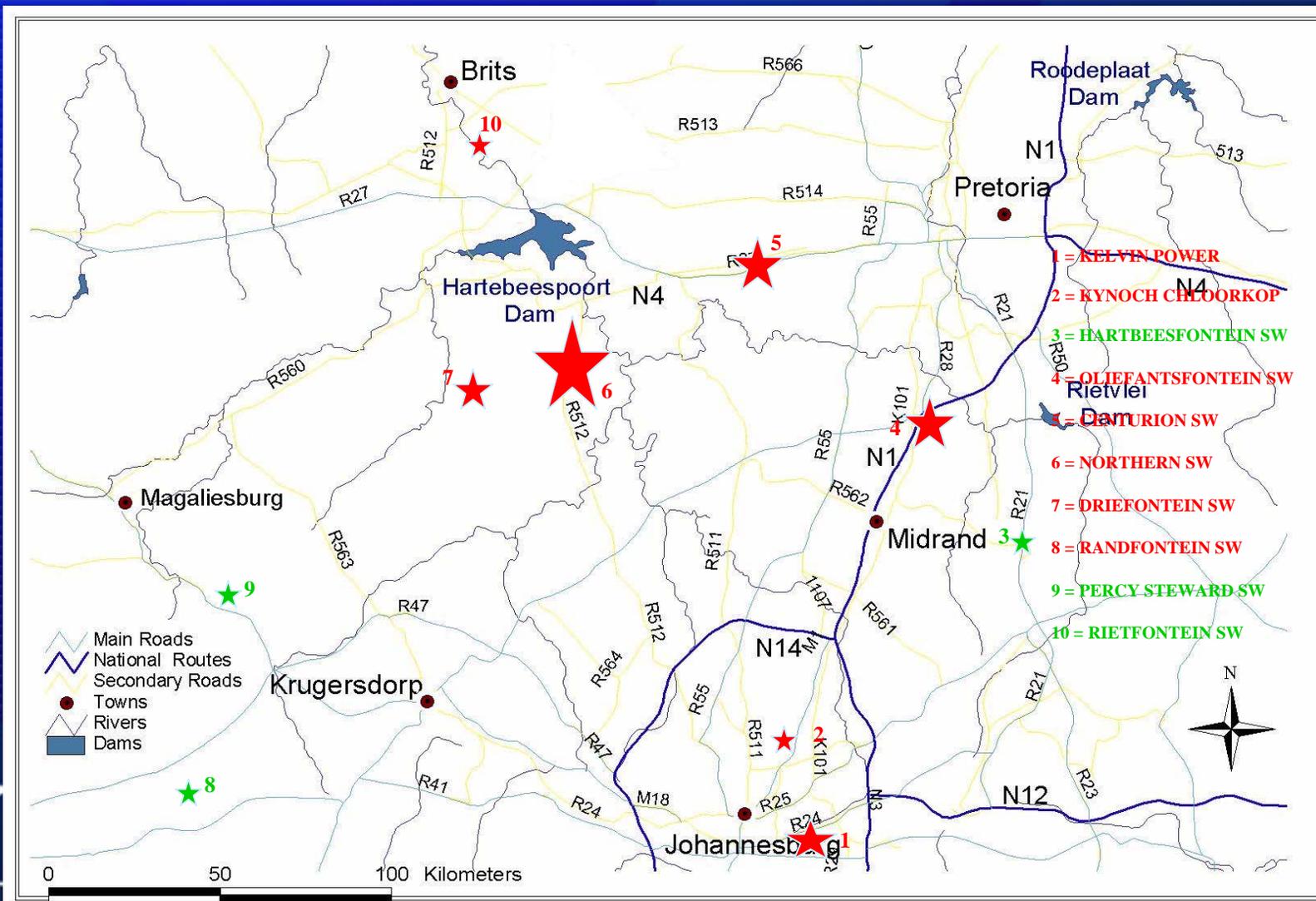
Probability (%) of Most Likely Category



# Possible Tiger programs?



# Hartbeespoort Dam: Significant PO<sub>4</sub> point discharges

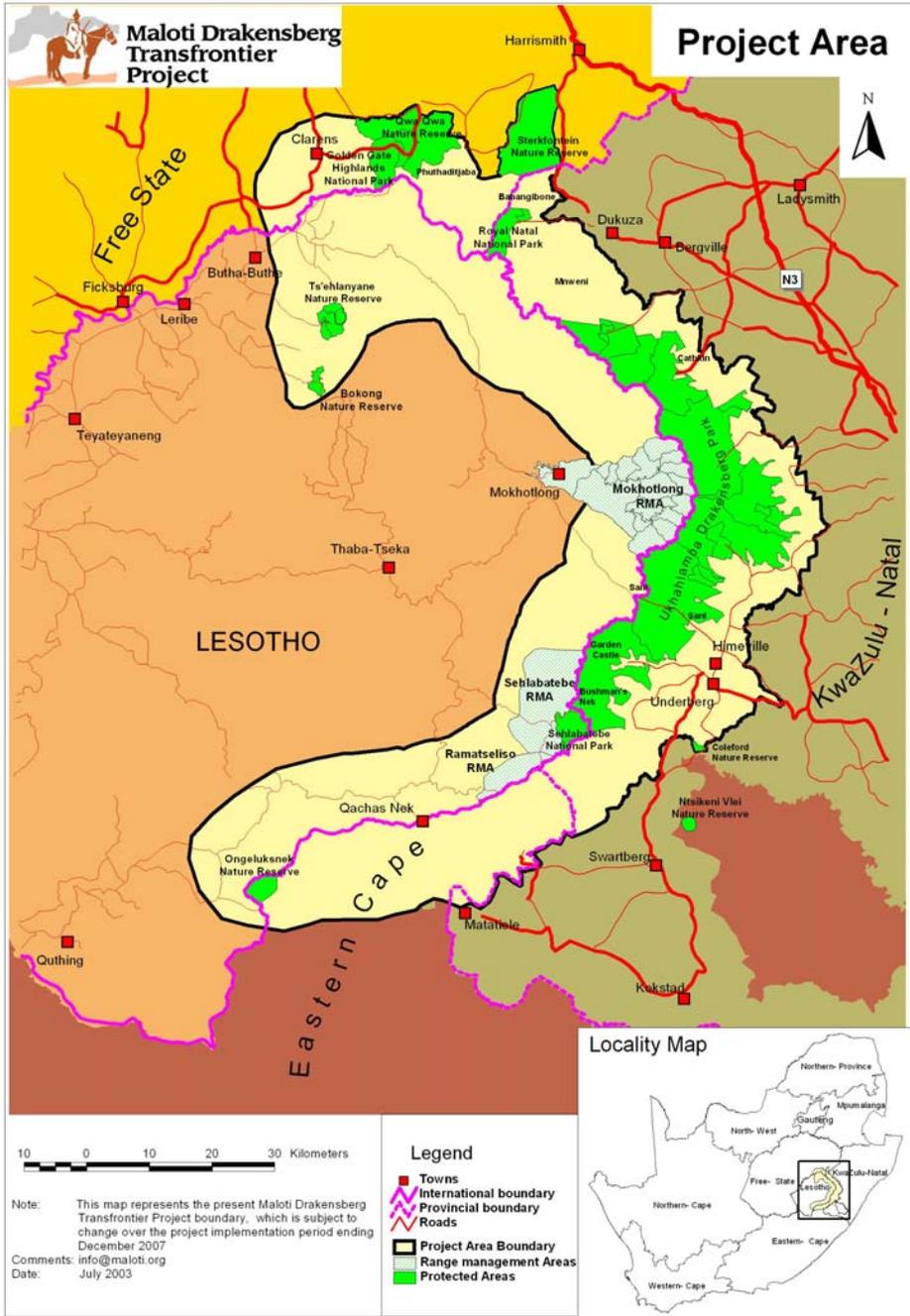




RAND WATER

APRIL 2003







**Maloti Drakensberg  
Transfrontier  
Project**

**The region is the most important water catchment area for the people of Lesotho and South Africa. Two of the largest civil engineering projects in southern Africa, the Tugela-Vaal Scheme and the Lesotho Highlands Water Project, carry water from the mountains to the economic powerhouse of Africa, the province of Gauteng.**



**RAND WATER**



**RAND WATER**

*Thank You*