water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

WATER RESOURCE INFORMATION MANAGEMENT

STATUS ON MONITORING & SURFACE WATER LEVEL TRENDS APRIL 2012 to SEPTEMBER 2012

D VILJOEN
DECEMBER 2012

GH4327

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1. EXECUTIVE SUMMARY

The majority of dams used in this report have less water than during the corresponding period last year.
In the Luvuvhu / Letaba Water Management Area the Middle Letaba Dam is at a critical stage of 0.7% and the Nsami and Albasini Dams with low storage levels of 19% and 34.5% respectively!

In the Limpopo WMA all dams have less water than the previous year:
The average storage volume for the Limpopo WMA is 224.1 million cubic meters (79.9%) and is 38.9 million cubic meters less than the corresponding period last year (93.8%).

The average storage volume for the Luvuvhu / Letaba WMA is 383.7 million cubic meters (58%) and is 80.8 million cubic meters less than the corresponding period last year (70.4%).

In the Sekhukune area the Flag Boshielo Dam is at a storage level of 84.1% (155.7 x $10^6 m^3$) and 14% lower than the previous year, which means that the storage volume is 25.9 million cubic meters less than the corresponding period last year.

The average storage volume for the Olifants WMA is 838.6 million cubic meters (78.1%) and is 187 million cubic meters less than the corresponding period last year (95.5%). Numerous smaller dams (0.7 – 3.5 million cubic meter capacity) exist in this WMA but only two are equipped with Data Loggers namely Piet Gouws and Molepo Dams. No Real Time data is available from these dams and the obtaining of updated dam status observations are hampered by the remoteness thereof. Although provision has been made at some dams for the installation of Data logging equipment, funds for the purchasing thereof are lacking. The following dams falls within the Olifants WMA, but no status information is available: 1. Piet Gouws (3.94 million Cubic meters), Lola Montes (1.2 million Cubic meters), Makotswane (3.48 million Cubic meters), Spitskop (0.54million Cubic meters), Vergelegen (1.34million Cubic meters) Dr. Esselen (0.73million Cubic meters), Chunnies Poort (2.47million Cubic meters meters), Der Broggen, Lepellane and Mahlangu dams.

The average storage volume for the Inkomati WMA is 913.6 million cubic meters (87%) and is 98.1 million cubic meters less than the corresponding period last year (96.4%).

The challenge in all the WMAs discussed in this report is the fact that there are smaller dams, which supply water to communities that still need to be monitored. Owing to the lack of data these dams could not be included. Infrastructure at these dams are also a major concern and will have to be put in place before any form of water level monitoring can be considered.

Gauge plates have been installed at some of the smaller dams, but there are no observers to relay gauge plate readings to the Tzaneen Office. Hout River Dam has been equipped with near real-time data acquisitioning equipment.

The information presented in this report is based on the status of all the major dams in the province up to the end of September 2012.

2. MONITORING NETWORK

The hydrological monitoring network for the Limpopo Province consists of the following amount of gauging stations:
81 river flow gauging stations (excluding canals and pipelines)
21 dam gauging stations
16 evaporation stations

It is important to take cognizance of the fact that the hydrological gauging stations in the Crocodile-West and Olifants Water Management Areas (shared boundaries) are being managed by the hydrological offices of Gauteng and Mpumalanga respectively.
For the purpose of this report and owing to the strategic location and importance of certain dams in the Olifants and Inkomati Water Management Areas, information regarding their status is also attached.

3. OVERVIEW

No river flow gauging stations were used in this report as their importance will only play a role when inflow stream requirements have to be met or during big flood events.

Take note that that the following dams have been included under the provincial boundary of the Limpopo Province: Modjadji, Nandoni, Flag Boshielo, Klaserie, Rust De Winter, Tonteldoos, Tours, Vlugkraal and Warmbad. This results in the full supply storage capacity increasing from 767.6 million cubic meters to 1166.6 million cubic meters.

To give an indication of what the percentage of normal rainfall was for the period October 2011 up to August 2012, see attached map (page 11). For information purposes a graph depicting provincial rainfall for the current hydrological year is attached (page 12). Rainfall forecasts for November 2012 up to January 2013 are also attached see page 17. This information was obtained from the South African Weather Service.

The National dam storage graph (page 13) has been attached to the report for additional information. The Limpopo Province dam storage graph (page 14) as well as the graphs of the two WMAs (page 15-16), indicates the current situation clearly.
This information was obtained from Mr Elias Nel, National Office.

For information purposes a table indicating the comparison of water storage percentage for the different WMA's is attached on page 17.
The purpose for attaching graphs of individual dams is to give a broader picture of water storage and status in the sub drainage catchments.

4. LIMPOPO WATER MANAGEMENT AREA

The catchment consists of secondary drainage areas A4, A5, A6, A7 and A8.

A4 Drainage Area (Matlabas, Mokolo Rivers)

The Mokolo Dam (A4R001) was used as no other dam exists in the A4 hydrological monitoring network. The dam storage is at a storage level of 95.7% (139.15 x $10^6 m^3$) and 2.5% lower than the previous year, which means that the storage volume is 3.6 million cubic meters less than the corresponding period last year. See attached graph!

4.2 A5 Drainage Area (Lephalala River)

Two small dams exists in the A5 hydrological network namely the Susandale Dam (A5R001) and the Vischgat Dam (A5R002). Owing to their relatively small storage volumes of approximately 0.6 million cubic meters in total, these dams have not been included in this report!

4.3 A6 Drainage Area (Nile, Sterk, Mogalakwena and Dorps Rivers)

The Doorndraai Dam (A6R001) and Glen Alpine Dam (A6R002) were used as no other dams exist in the A6 hydrological monitoring network. The Doorndraai Dam is at a storage level of 90.5% (39.6 x $10^6 m^3$) and 6.6% lower than the previous year, which means that the storage volume is 2.88 million cubic meters more than the corresponding period last year. See attached graph!
Glen Alpine Dam is at a storage level of 52.6% (9.9 x $10^6 m^3$) and 16.9% lower than the previous year, which means that the storage volume is 3.19 million cubic meters less than the corresponding period last year. See attached graph!
It must be noted that the full capacity storage of Glen Alpine Dam is only 18.889 million cubic and therefore the dam fills and empties much faster than Doorndraai Dam! The graph of Glen Alpine clearly indicates this!
Take note that the full supply capacity (18.889 x $10^6 m^3$) as supplied in the National Weekly Dam Status report, was used for calculation purposes!

4.4 A7 Drainage Area (Sand, Blood, Diep, Hout, Dwars and Brak Rivers)

There are no existing dam monitoring stations in the hydrological network for this drainage area!
The Tzaneen Area Office in conjunction with the Hydrometry office is currently busy with the installation of gauge plates at dams in both of the Water Management Areas. Hout River Dam has been equipped with gauge plates, but a futile exercise at Mashashane Dam just iterated the point that gauge plates should be installed once water levels are below lowest outlet levels! Data capturing and real-time equipment has been installed at Hout River Dam.

Seshego and Rietfontein Dams will be investigated, but due to high water levels and the lack of infrastructure, the installation of gauge plates remains a huge challenge. According to preliminary investigations it seems obvious that the installation of gauge plates will only be feasible when water levels at these dams are on or below lowest outlet levels!

4.5 A8 Drainage Area (Nwanedzi and Nzhelele Rivers)

The Nzhelele Dam (A8R001), Luphephe (A8R002), Nwanedzi (A8R003) and Mutshedzi (A8R004) Dams were used as indicators! The Nzhelele Dam is at a storage level of 51.9% (26.6x 10^6m^3) and 38.2% lower than the previous year, which means that the storage volume is 19.57 million cubic meters less than the corresponding period last year. See attached graph!

Luphephe and Nwanedzi Dams are at storage levels of 36.5% and 46.7% respectively. Their combined storage is at 7.5 x 10^6m^3. The combined storage for the corresponding period the previous year was 15.9 x 10^6m^3. (83.1% of storage volume) See attached graphs!

Mutshedzi Dam, is at a storage level of 64.1% (1.31x 10^6m^3) and 26% lower than the previous year, which means that the storage volume is 0.53 million cubic meters less than the corresponding period last year. See attached graph!

5. LUVUVHU / LETABA WATER MANAGEMENT AREA

The catchment consists of secondary drainage areas A9, B8 and B9.

5.1 A9 Drainage Area (Mutale, Luvuvhu Rivers)

The Albasini Dam (A9R001), Vondo Dam (A9R002) and Nandoni (A9R004) Dams were used as monitoring points in this report.

Albasini Dam is at a storage level of 34.5% (9.72 x 10^6m^3) and 12.8% lower than the previous year, which means that the storage volume is 3.6 million cubic meters less than the corresponding period last year. See attached graph!

Vondo Dam is at a storage level of 75.6% (23.0 x 10^6m^3) and 14.8% lower than the previous year, which means that the storage volume is 4.5 million cubic meters less than the corresponding period last year. See attached graph!

Nandoni Dam is at a storage level of 87.48% (145.11 x 10^6m^3) and 12.7% lower than the previous year, which means that the storage volume is 21.2 million cubic meters less than the corresponding period last year. See attached graph!

5.2 B8 Drainage Area (Groot, Middle and Klein Letaba Rivers)

The Ebenezer Dam (B8R001), Magoebaskloof Dam (B8R003), Tzaneen Dam (B8R005), Middle-Letaba Dam (B8R007), Nsami Dam (B8R009) and Modjadji Dam (B8R011) were used as monitoring points in this report. The Dap Naudé Dam (B8R006) and Hans Merensky Dam (B8R002) are also being monitored, but were not included in this report!

Thapane Dam has been investigated but due to high water levels and the lack of infrastructure, the installation of gauge plates remains a huge challenge. According to preliminary investigations it seems obvious that the installation of gauge plates will only be feasible when the water level at this dam is on or below lowest outlet level!

The Ebenezer Dam is at a storage level of 96.1% (66.43 x 10^6m^3) and 2.7% lower than the previous year, which means that the storage volume is 1.88 million cubic meters less than the corresponding period last year. See attached graph!

Magoebaskloof Dam is at a storage level of 100.2% (4.85 x $10^6 m^3$) and 0.4% lower than the previous year, which means that the storage volume is 0.021 million cubic meters more than the corresponding period last year. See attached graph! Take note that the full supply capacity (4.84 x $10^6 m^3$) as supplied in the National Weekly Dam Status report, was used for calculation purposes!

Tzaneen Dam is at a storage level of 77.5% (121.37 x $10^6 m^3$) and 19.1% lower than the previous year, which means that the storage volume is 29.8 million cubic meters less than the corresponding period last year. See attached graph! Take note that the full supply capacity (156.53 x $10^6 m^3$) as supplied in the National Weekly Dam Status report, was used for calculation purposes!

Middle-Letaba Dam is at a critical low storage level of 0.7% (1.19 x $10^6 m^3$) and 9.7% lower than the previous year, which means that the storage volume is 16.7 million cubic meters less than the corresponding period last year. See attached graph!

The Nsami Dam is at a low storage level of 19.2% (4.19 x $10^6 m^3$) and 27.4% lower than the previous year, which means that the storage volume is 6.0 million cubic meters less than the corresponding period last year.

The Modjadji Dam is at a storage level of 68.2% (4.9 x $10^6 m^3$) and 21.5% lower than the previous year, which means that the storage volume is 1.54 million cubic meters less than the corresponding period last year.

5.3 B9 Drainage Area (Shingwedzi, Phugwane and Mphongolo Rivers)

Only a limited part of this drainage area falls outside the Kruger National Park!
There are no existing dam monitoring stations in the hydrological network for this drainage area!

6. OLIFANTS WATER MANAGEMENT AREA

Monitoring points in the B3, B5, B6 and, B7 sub drainage areas were also included in this report owing to their strategic location and importance to operational matters in the Limpopo Province.

6.1 B3 Drainage Area (Olifants, Elands, Bloed and Selons Rivers)

For information as well as operational matters the status of Rust de Winter Dam (B3R001) and Loskop Dam (B3R002) has been included in this report.

Rust de Winter Dam is at a storage level of 83.3% (23.49 x $10^6 m^3$) and 15.7% lower than the previous year, which means that the storage volume is 4.42 million cubic meters less than the corresponding period last year. See attached graph!

Loskop Dam is at a storage level of 82.3% (297.39 x $10^6 m^3$) and 12% lower than the previous year, which means that the storage volume is 47.13 million cubic meters less than the corresponding period last year. See attached graph!

6.2 B5 Drainage Area (Olifants River)

For information as well as operational matters the status of Flag Boshielo Dam (B5R002) has been included in this report.

Flag Boshielo Dam is at a storage level of 84.1% (155.72 x $10^6 m^3$) and 14% lower than the previous year, which means that the storage volume is 25.9 million cubic meters less than the corresponding period last year. See attached graph!

6.3 B6 Drainage Area (Blyde and Ohrigstad Rivers)

For information as well as operational matters the status of Ohrigstad Dam (B6R001) and Blyde Rivierspoort Dam (B6R003) has been included in this report.

Ohrigstad Dam is at a storage level of 72% (9.68 x 10^6m^3) and 3.6% lower than the previous year, which means that the storage volume is 0.48 million cubic meters less than the corresponding period last year. See attached graph!
Take note that the full supply capacity (13.448 x 10^6m^3) as supplied in the National Weekly Dam Status report, was used for calculation purposes!

Blyde Dam is at a storage level of 100.1% (54.42 x 10^6m^3) and 4.8% higher than the previous year, which means that the storage volume is 2.6 million cubic meters more than the corresponding period last year. See attached graph!

Take note that the full supply capacity (54.369 x 10^6m^3) as supplied in the National Weekly Dam Status report, was used for calculation purposes!

6.4 B7 Drainage Area (Klaserie and Olifants Rivers)

For information as well as operational matters the status of Klaserie Dam (B7R001) and Tours Dam (B7R003) has been included in this report.

Klaserie Dam is at a storage level of 95.2% (5.34 x 10^6m^3) and 4.9% lower than the previous year, which means that the storage volume is 0.27 million cubic meters less than the corresponding period last year. See attached graph!

Tours Dam is at a storage level of 95.4% (5.8 x 10^6m^3) and 2.1% lower than the previous year, which means that the storage volume is 0.13 million cubic meters less than the corresponding period last year. See attached graph!

Take note that the full supply capacities (5.604 x 10^6m^3 and 6.084 x 10^6m^3) Klaserie and Tours Dams respectively, as supplied in the National Weekly Dam Status report, were used for calculation purposes!

7. NKOMATI WATER MANAGEMENT AREA

7.1 X2 Drainage Area (Crocodile River)

For information as well as operational matters the status of Kwena Dam (X2R005) has been included in this report.

Kwena Dam is at a storage level of 96.6% (153.46 x 10^6m^3) and 1.5% higher than the previous year, which means that the storage volume is 2.4 million cubic meters more than the corresponding period last year. See attached graph!

7.2 X3 Drainage Area (Mariti River)

For information as well as operational matters the status of Inyaka Dam (X3R002) has been included in this report.

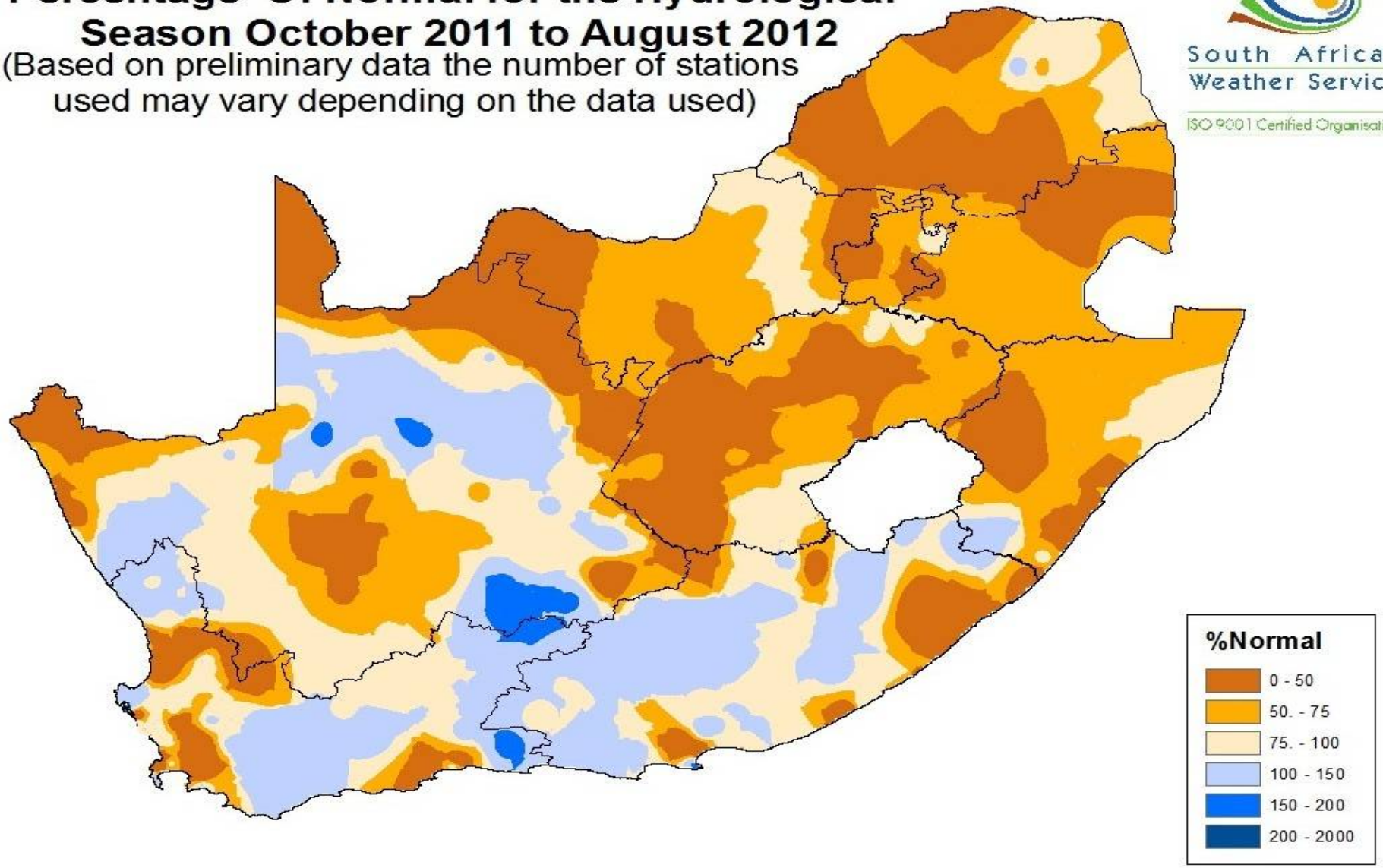
Inyaka Dam is at a storage level of 98.6% (121.88 x 10^6m^3) and 1.3% lower than the previous year, which means that the storage volume is 1.66 million cubic meters less than the corresponding period last year. See attached graph!

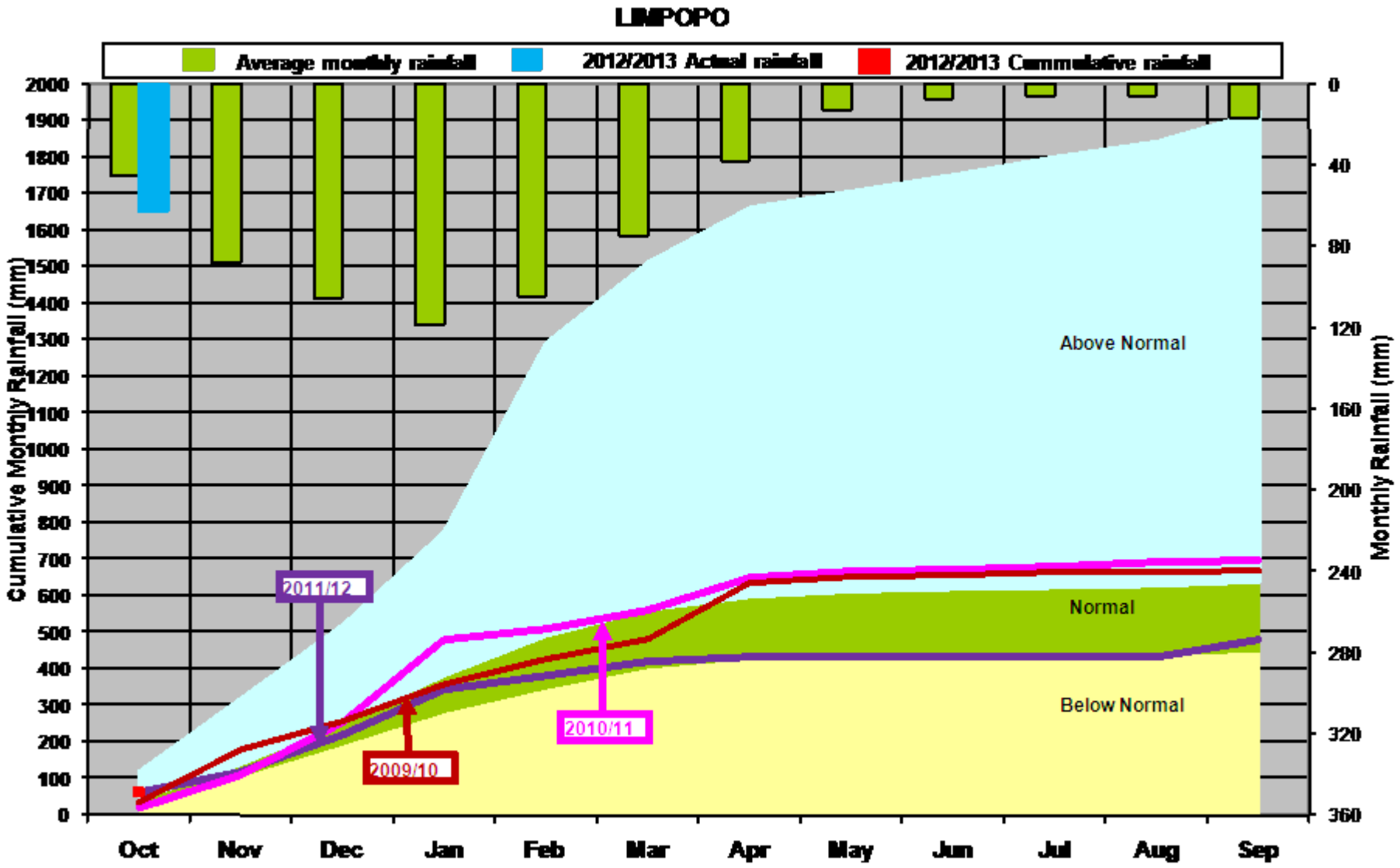
Percentage Of Normal for the Hydrological Season October 2011 to August 2012

(Based on preliminary data the number of stations used may vary depending on the data used)

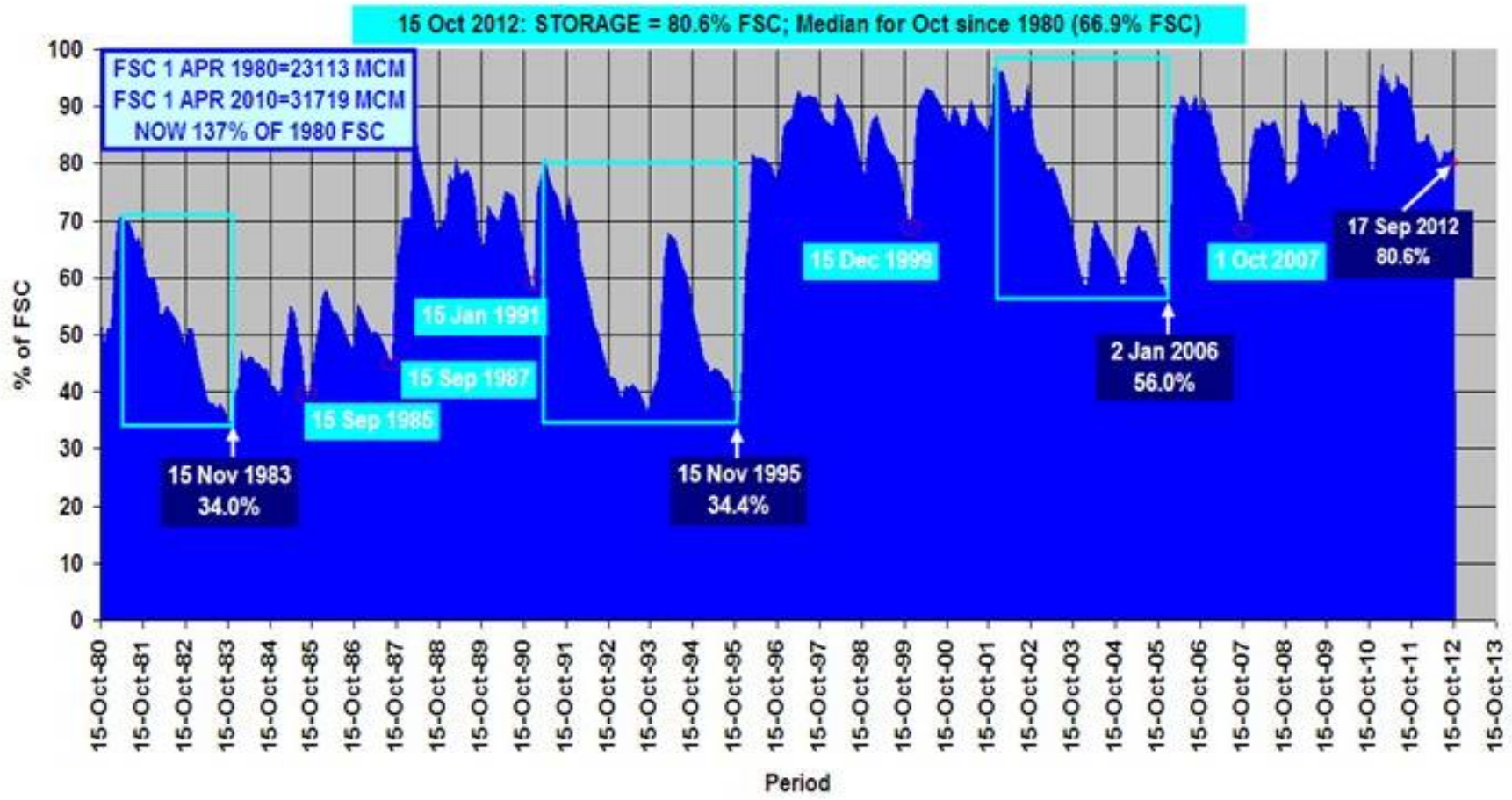
South African Weather Service

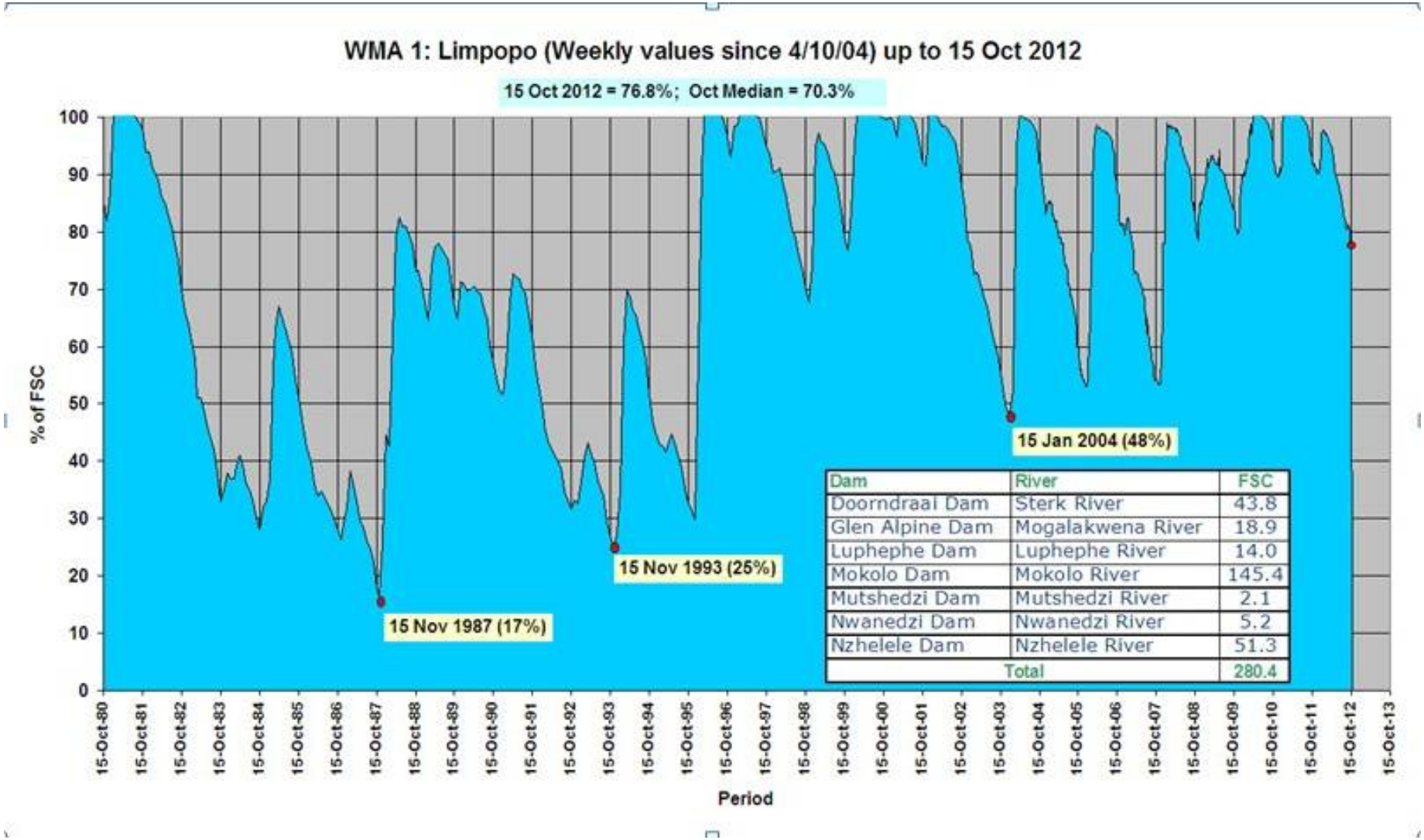
ISO 9001 Certified Organisation

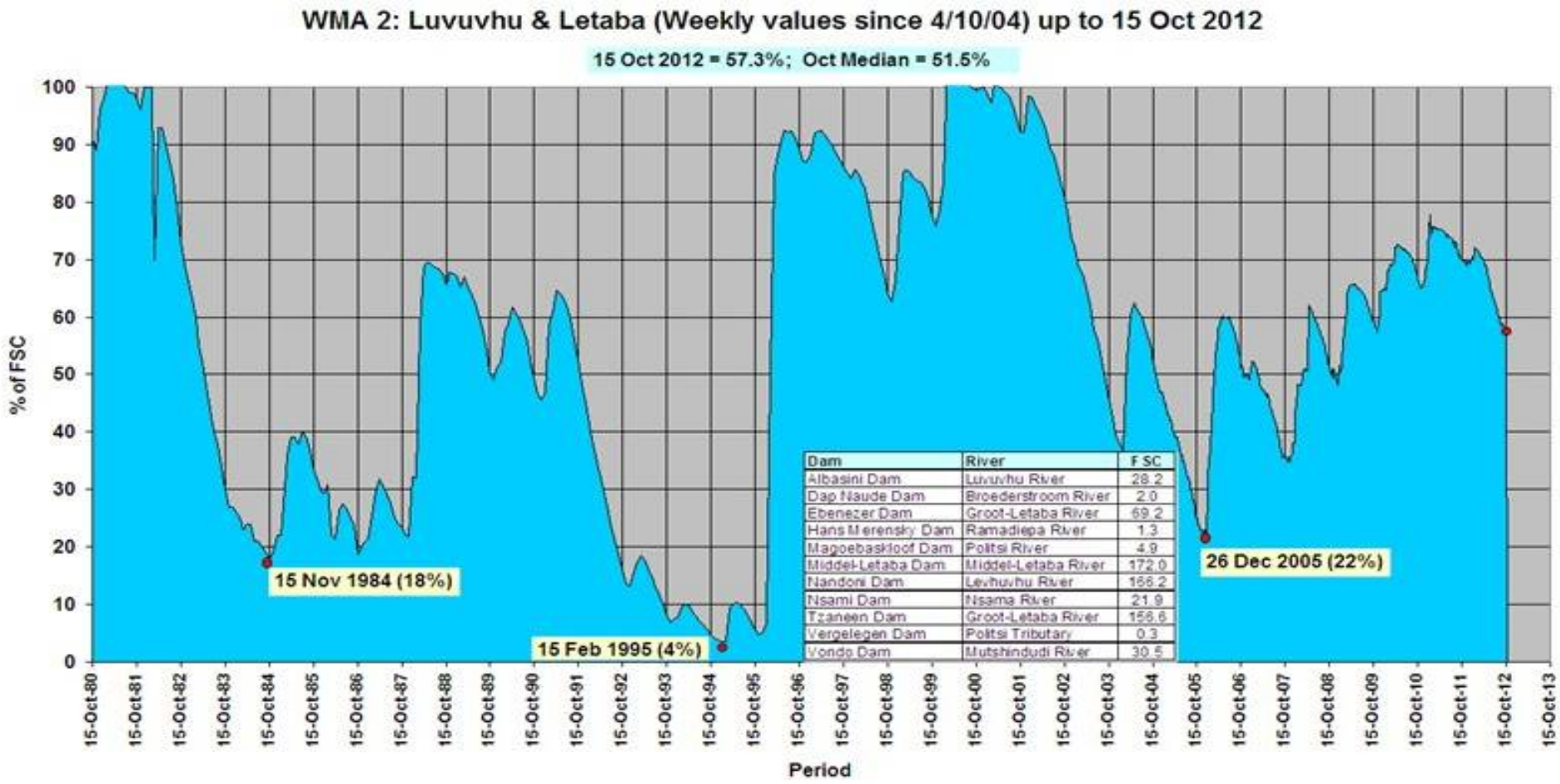



LIMPOPO
Average monthly rainfall
2012/2013 Actual rainfall
2012/2013 Cummulative rainfall
Cumulative Monthly Rainfall (mm)
Monthly Rainfall (mm)
Above Normal
Normal
Below Normal
2011/12
2009/10
2010/11
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep

National Dams: Water Storage: The Storage for 15 Oct 2012 is the 8th highest on record (33 years) for Oct since Oct 1980 to 15 Oct 2012 (Weekly values since 4/10/04)

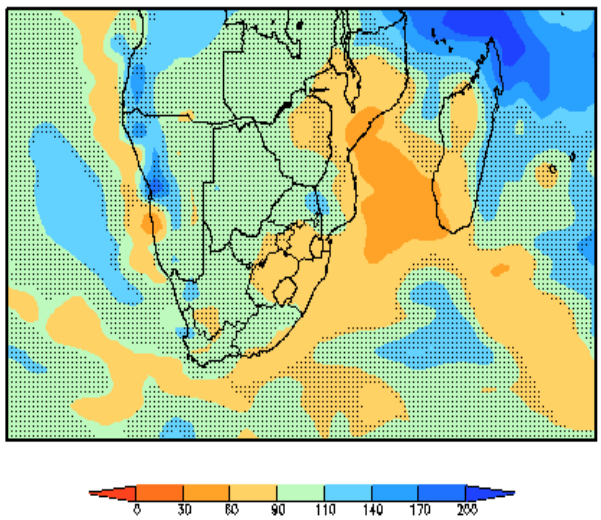


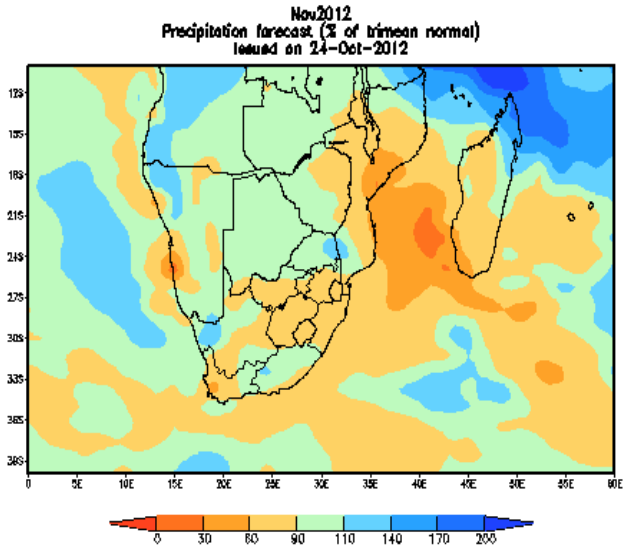

WMA 1: Limpopo (Weekly values since 4/10/04) up to 15 Oct 2012
15 Oct 2012 = 76.8%; Oct Median = 70.3%
% of FSC
Period
15 Nov 1987 (17%)
15 Nov 1993 (25%)
15 Jan 2004 (48%)
Dam | River | FSC
Doorndraai Dam | Sterk River | 43.8
Glen Alpine Dam | Mogalakwena River | 18.9
Luphephe Dam | Luphephe River | 14.0
Mokolo Dam | Mokolo River | 145.4
Mutshedzi Dam | Mutshedzi River | 2.1
Nwanedzi Dam | Nwanedzi River | 5.2
Nzhelele Dam | Nzhelele River | 51.3
Total | 280.4

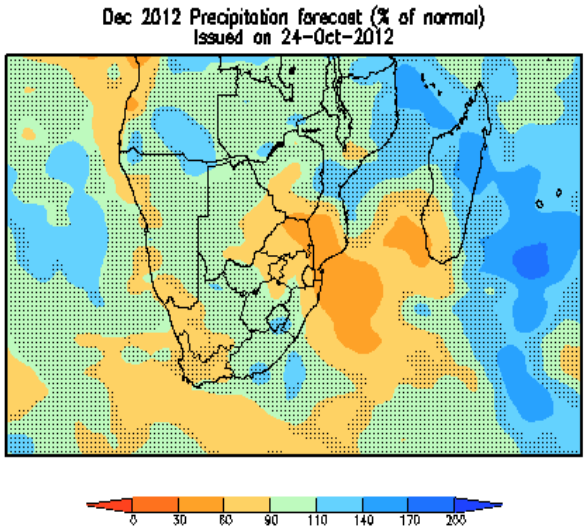

WMA 2: Luvuvhu & Letaba (Weekly values since 4/10/04) up to 15 Oct 2012
15 Oct 2012 = 57.3%; Oct Median = 51.5%
% of FSC
Period
15 Nov 1984 (18%)
15 Feb 1995 (4%)
26 Dec 2005 (22%)
Dam | River | FSC
Albasini Dam | Luvuvhu River | 28.2
Dap Naude Dam | Broederstroom River | 2.0
Ebenezer Dam | Groot-Letaba River | 69.2
Hans Merensky Dam | Ramadiepa River | 1.3
Magoebaskloof Dam | Politsi River | 4.9
Middel-Letaba Dam | Middel-Letaba River | 172.0
Nandoni Dam | Levhuvhu River | 166.2
Nsami Dam | Nsama River | 21.9
Tzaneen Dam | Groot-Letaba River | 156.6
Vergelegen Dam | Politsi Tributary | 0.3
Vondo Dam | Mutshindudi River | 30.5

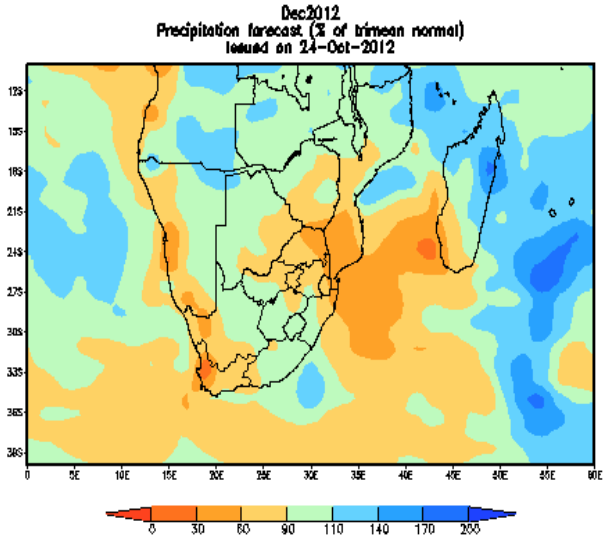
	Summary WMA	Full Supply Capacity 10^6M^3	Water in Storage 10^6M^3	Last Year %Full	Last Week %Full	This Week %Full
1	Limpopo	280.4	224.1	93.8	81.0	79.9
2	Luvubu/Letaba	652.5	378.8	70.2	58.5	58.1
3	Crocodile (West) Marico	813.8	619.7	88.4	76.7	76.1
4	Olifants	1073.9	838.6	95.5	78.8	78.1
5	Inkomati	1049.5	913.6	96.4	87.1	87.0
6	Usutu/Mhlatuze	3276.2	2186.7	77.7	66.8	66.7
7	Thukela	1115.3	1010.9	94.4	90.6	90.6
8	Upper Vaal	5659.2	4641.2	94.6	82.2	82.0
9	Middle Vaal	1671.6	1061.5	95.3	64.1	63.5
10	Lower Vaal	108.5	87.9	96.8	77.1	81.0
11	Mvoti/Umzimkulu	801.9	670.4	90.5	83.7	83.6
12	Mzimvubu/Keiskamma	1084.0	932.0	98.4	86.8	86.0
13	Upper Orange	11428.5	10191.7	94.0	89.4	89.2
14	Lower Orange	36.1	38.0	106.5	103.9	105.3
15	Fish/Tsitsikamma	725.6	506.2	68.0	68.5	69.8
16	Gouritz	268.8	235.8	82.4	88.1	87.7
17	Olifants/Doorn	128.2	128.5	99.0	99.8	100.2
18	Breede	1038.9	931.6	82.4	88.5	89.7
19	Berg	416.5	421.5	93.6	100.5	101.2
	GRAND TOTAL	31629.5	26018.6	91.0	82.4	82.3

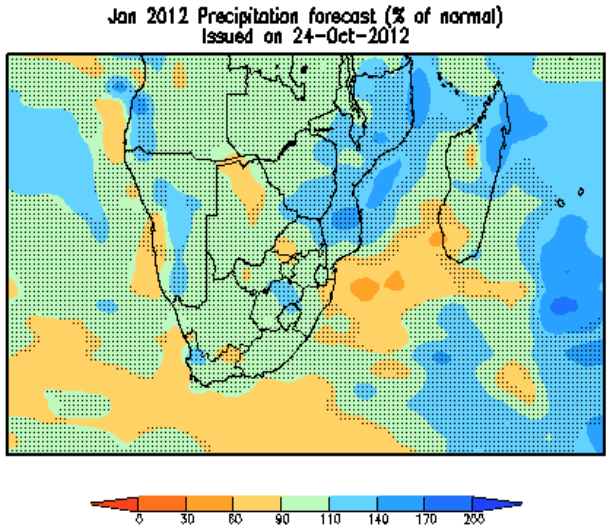
MONTHLY FORECAST
NOV – JAN 2013

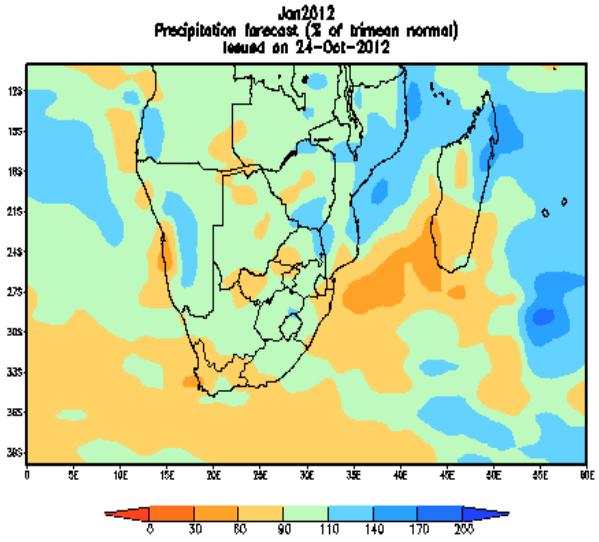


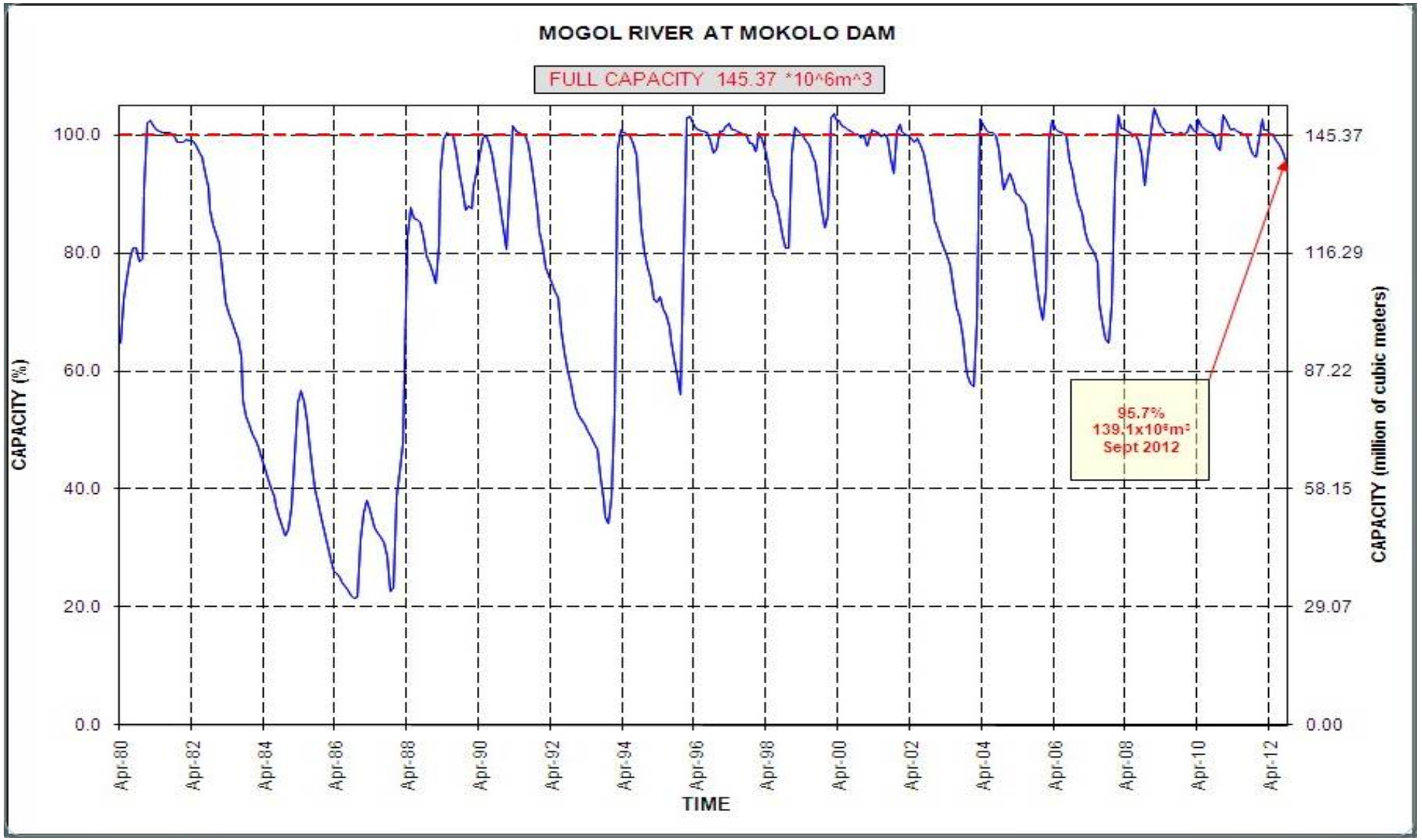


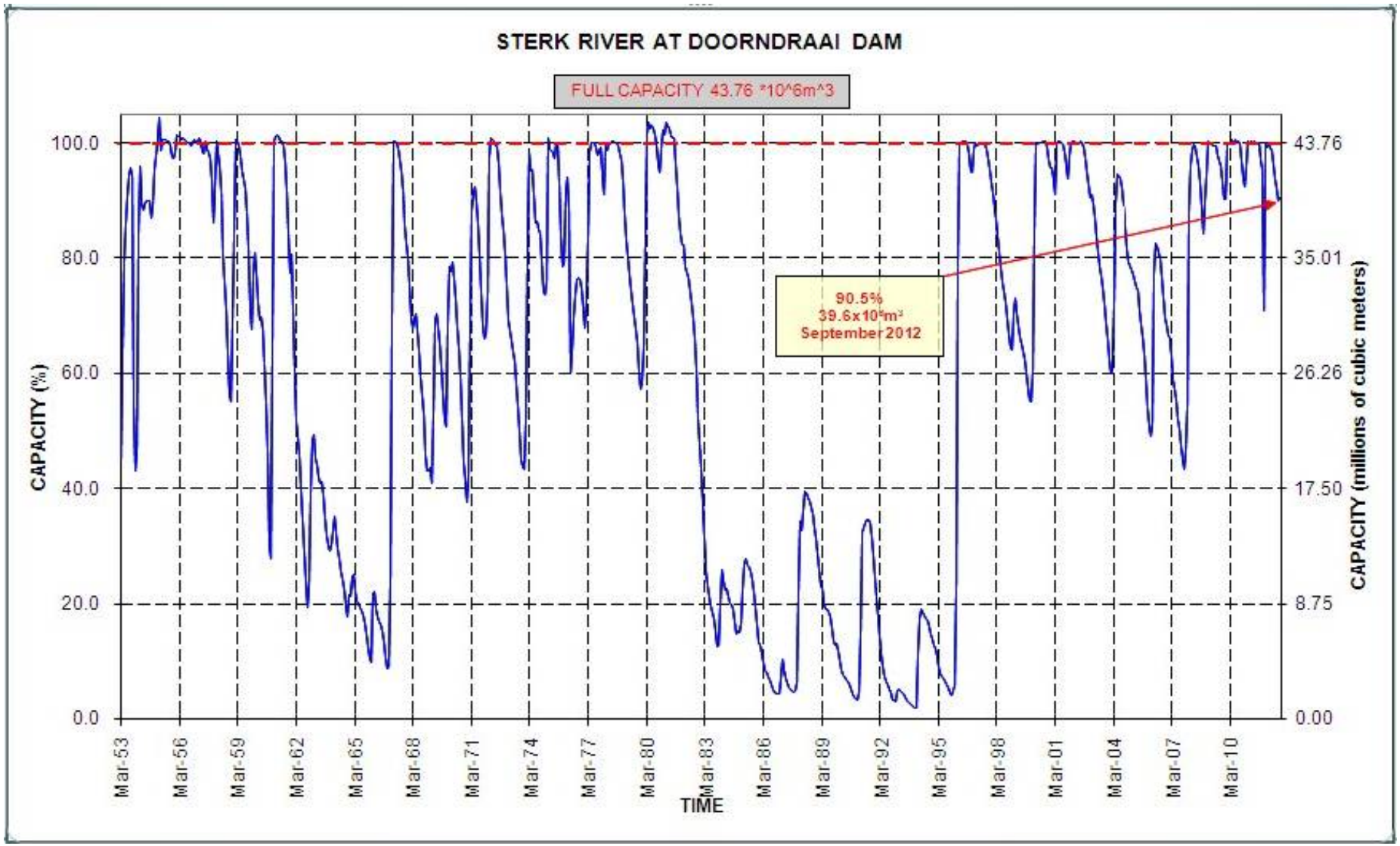









MOGOL RIVER AT MOKOLO DAM
FULL CAPACITY 145.37 *10^6m^3
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0
145.37
116.29
87.22
58.15
29.07
0.00
CAPACITY (million of cubic meters)
95.7%
139.1x10⁶m³
Sept 2012
Apr-80
Apr-82
Apr-84
Apr-86
Apr-88
Apr-90
Apr-92
Apr-94
Apr-96
Apr-98
Apr-00
Apr-02
Apr-04
Apr-06
Apr-08
Apr-10
Apr-12
TIME


STERK RIVER AT DOORNDRAAI DAM
FULL CAPACITY 43.76 *10^6m^3
90.5%
39.6x10⁶m³
September 2012
CAPACITY (%)
CAPACITY (millions of cubic meters)
TIME
100.0
80.0
60.0
40.0
20.0
0.0
43.76
35.01
26.26
17.50
8.75
0.00
Mar-53
Mar-56
Mar-59
Mar-62
Mar-65
Mar-68
Mar-71
Mar-74
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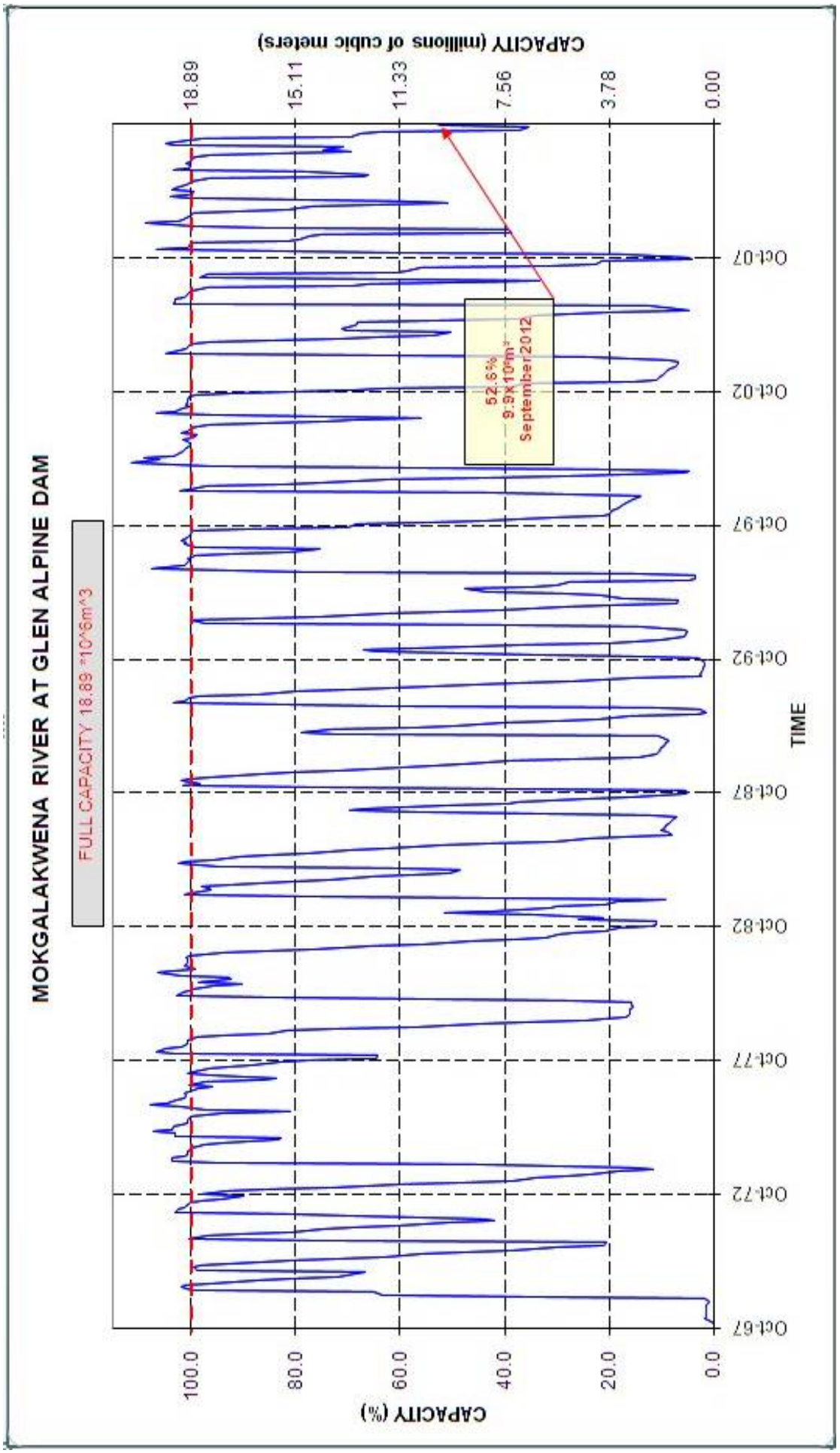
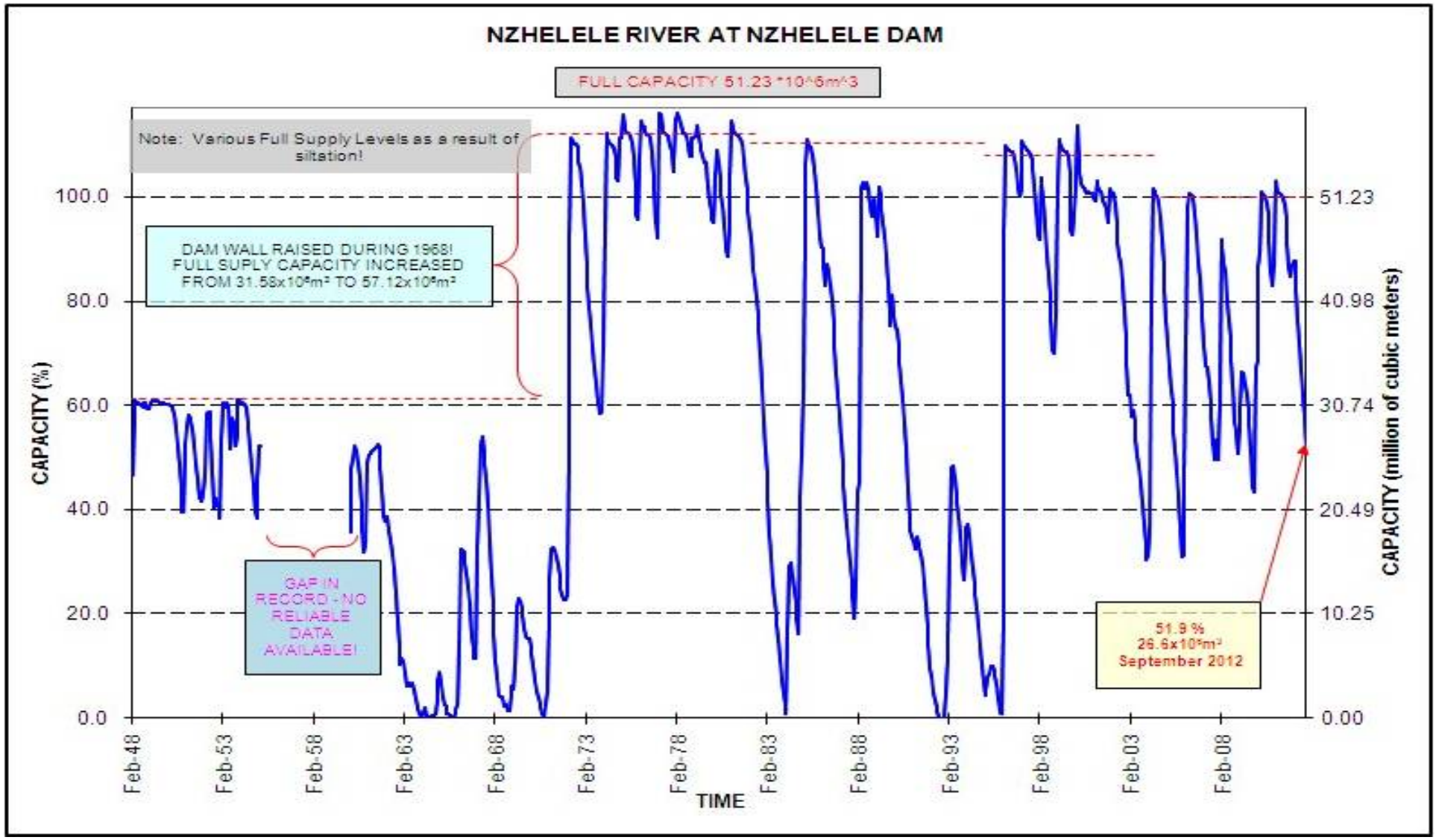
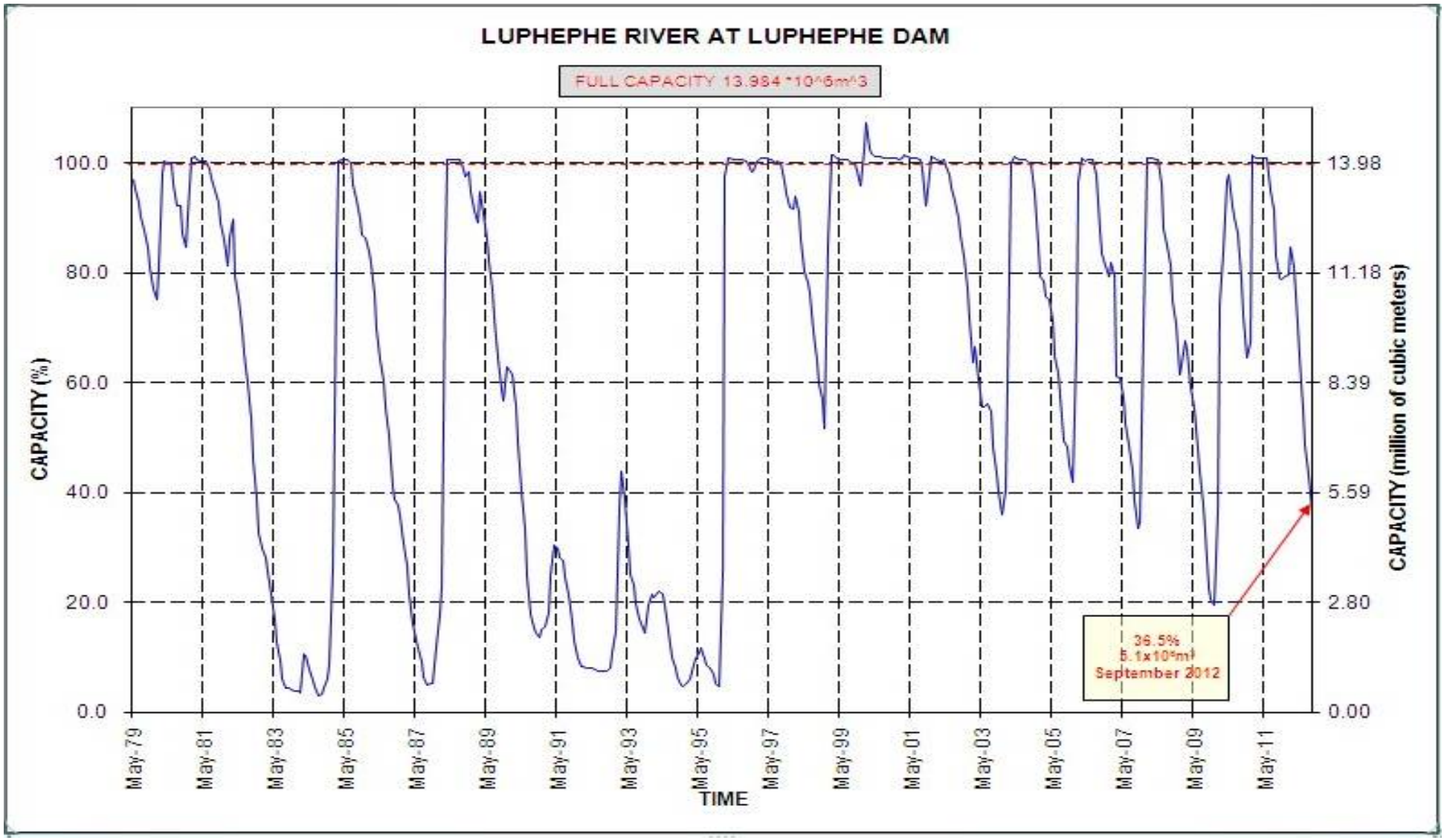
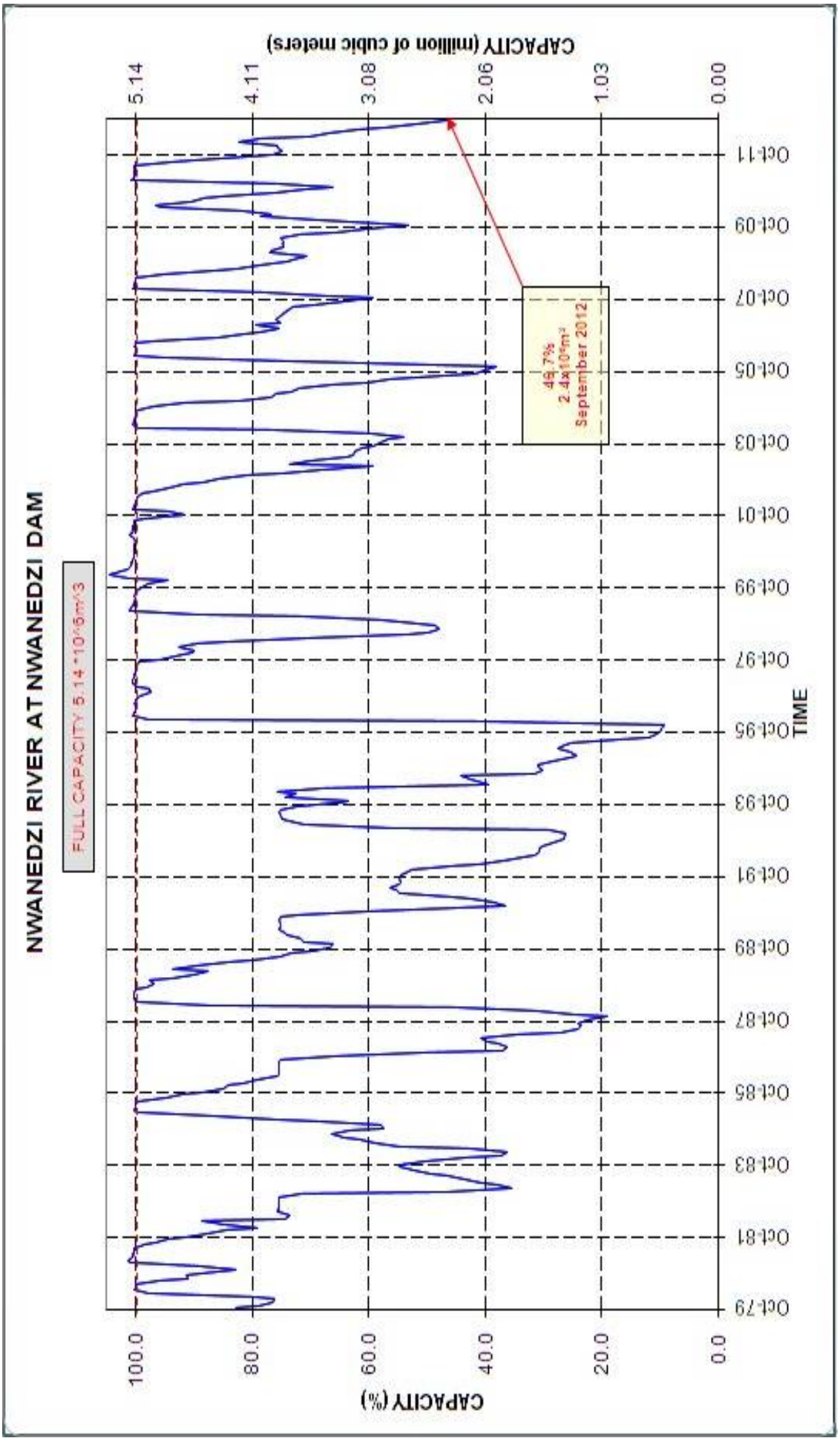
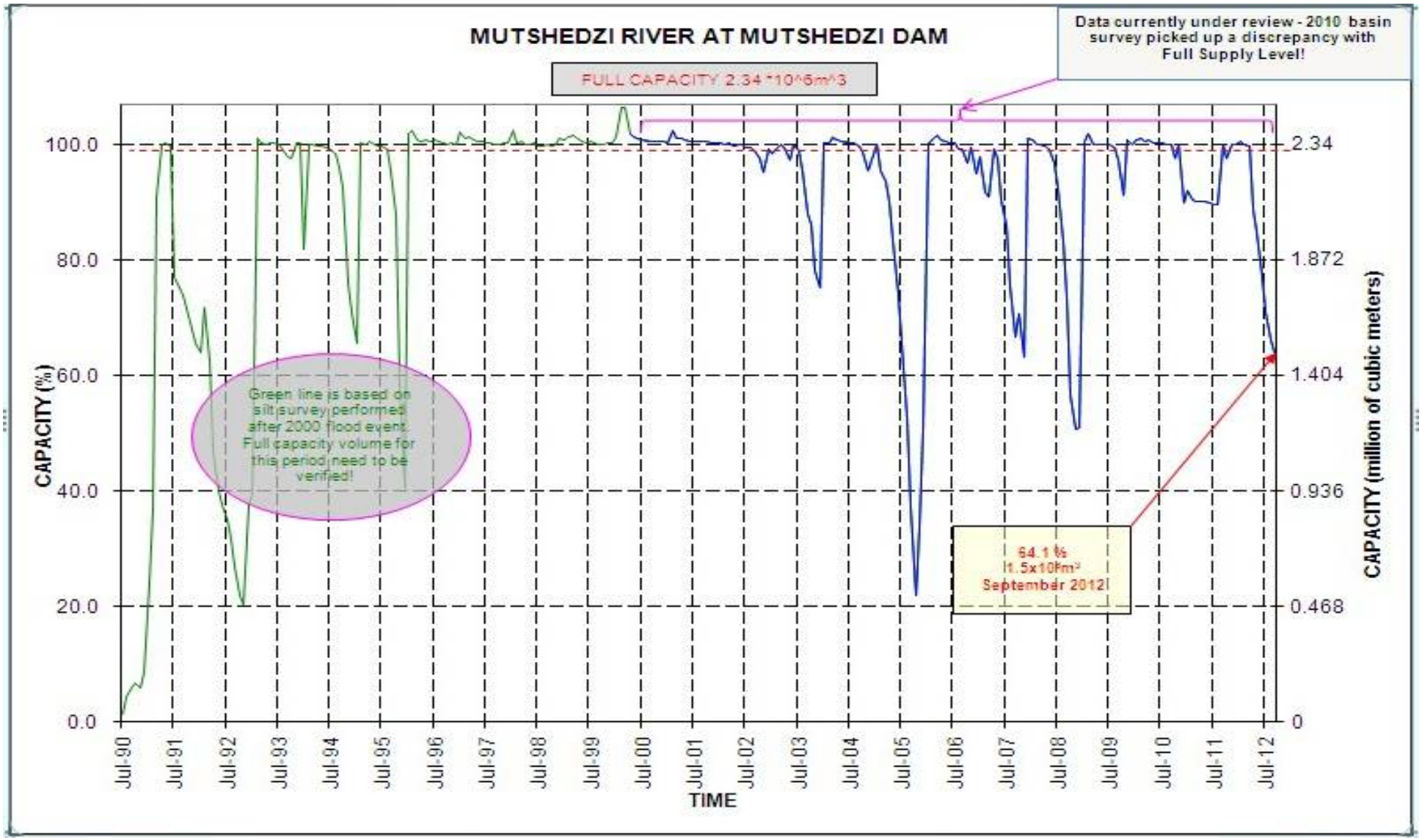
Mar-95
Mar-98
Mar-01
Mar-04
Mar-07
Mar-10

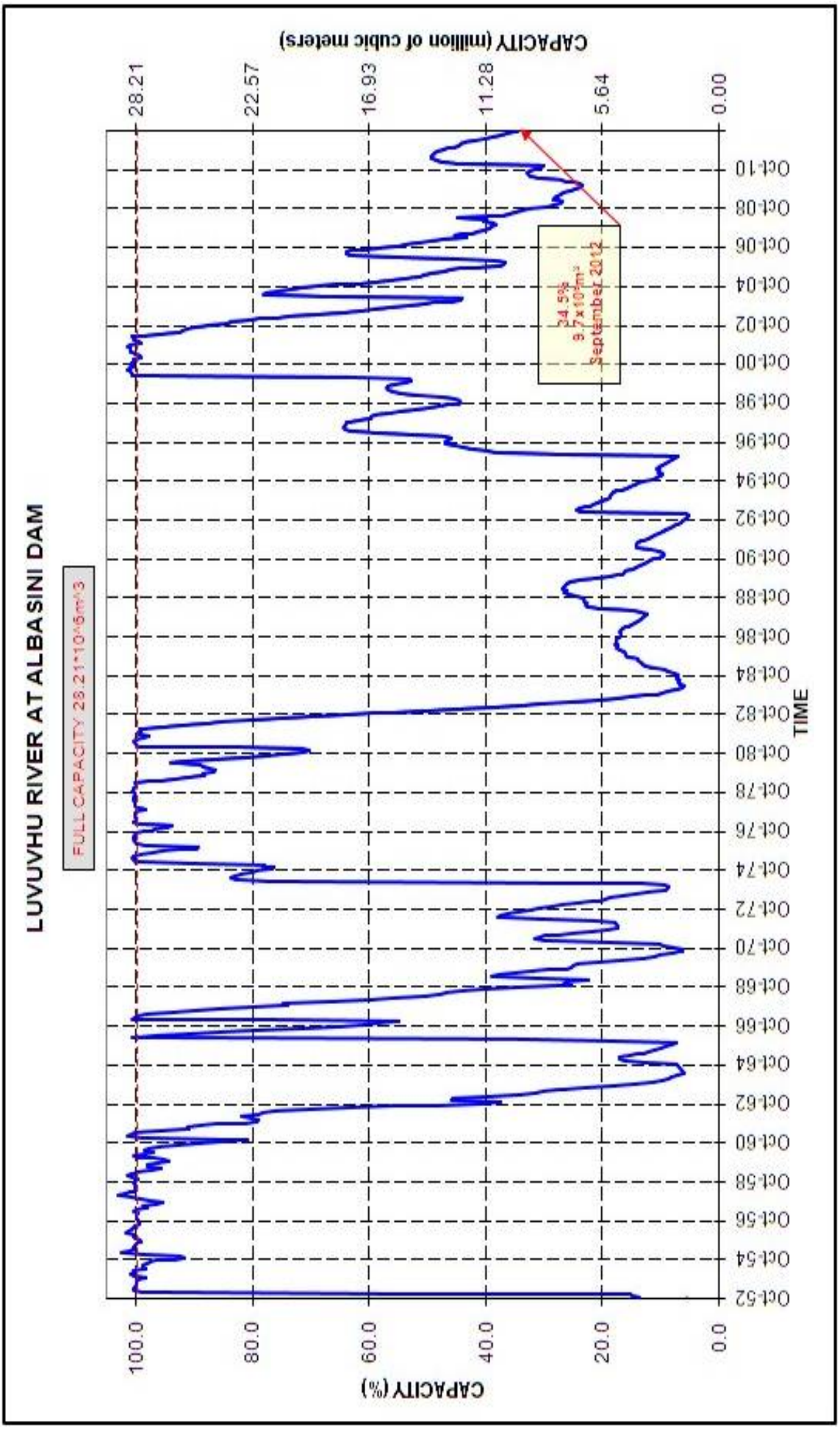

MOKGALAKWENA RIVER AT GLEN ALPINE DAM
FULL CAPACITY 18.89 *10^6m^3
CAPACITY (millions of cubic meters)
18.89
15.11
11.33
7.56
3.78
0.00
52.6%
9.9X10^6m^3
September/2012
Oct-07
Oct-02
Oct-97
Oct-92
Oct-87
Oct-82
Oct-77
Oct-72
Oct-67
TIME
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0

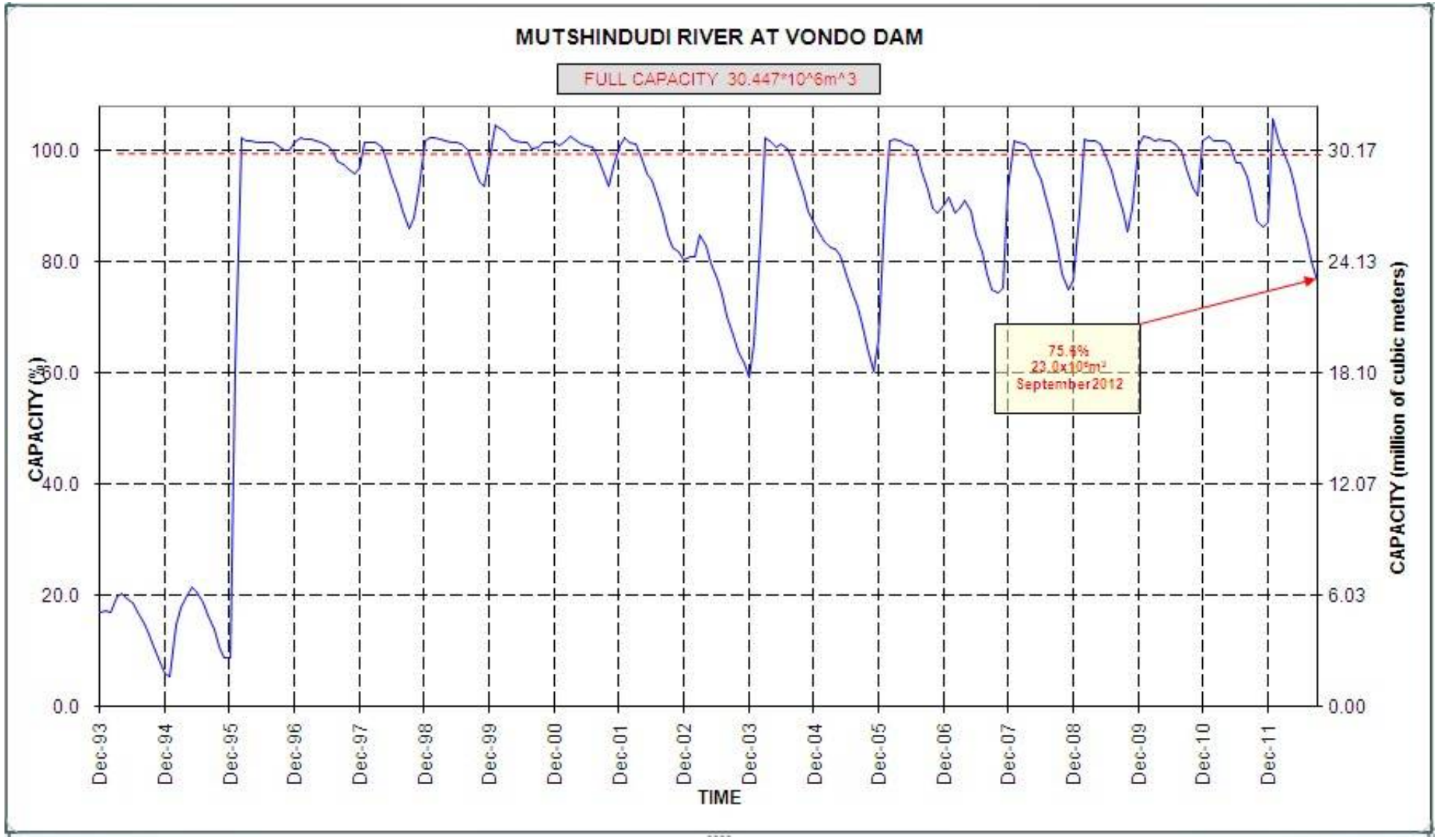

NZHELELE RIVER AT NZHELELE DAM
FULL CAPACITY 51.23*10^6m^3
Note: Various Full Supply Levels as a result of siltation!
DAM WALL RAISED DURING 1968! FULL SUPLY CAPACITY INCREASED FROM 31.58x10⁶m³ TO 57.12x10⁶m³
GAP IN RECORD - NO RELIABLE DATA AVAILABLE!
51.9 % 26.6x10⁶m³ September 2012
CAPACITY (%)
CAPACITY (million of cubic meters)
100.0
80.0
60.0
40.0
20.0
0.0
51.23
40.98
30.74
20.49
10.25
0.00
Feb-48
Feb-53
Feb-58
Feb-63
Feb-68
Feb-73
Feb-78
Feb-83
Feb-88
Feb-93
Feb-98
Feb-03
Feb-08
TIME

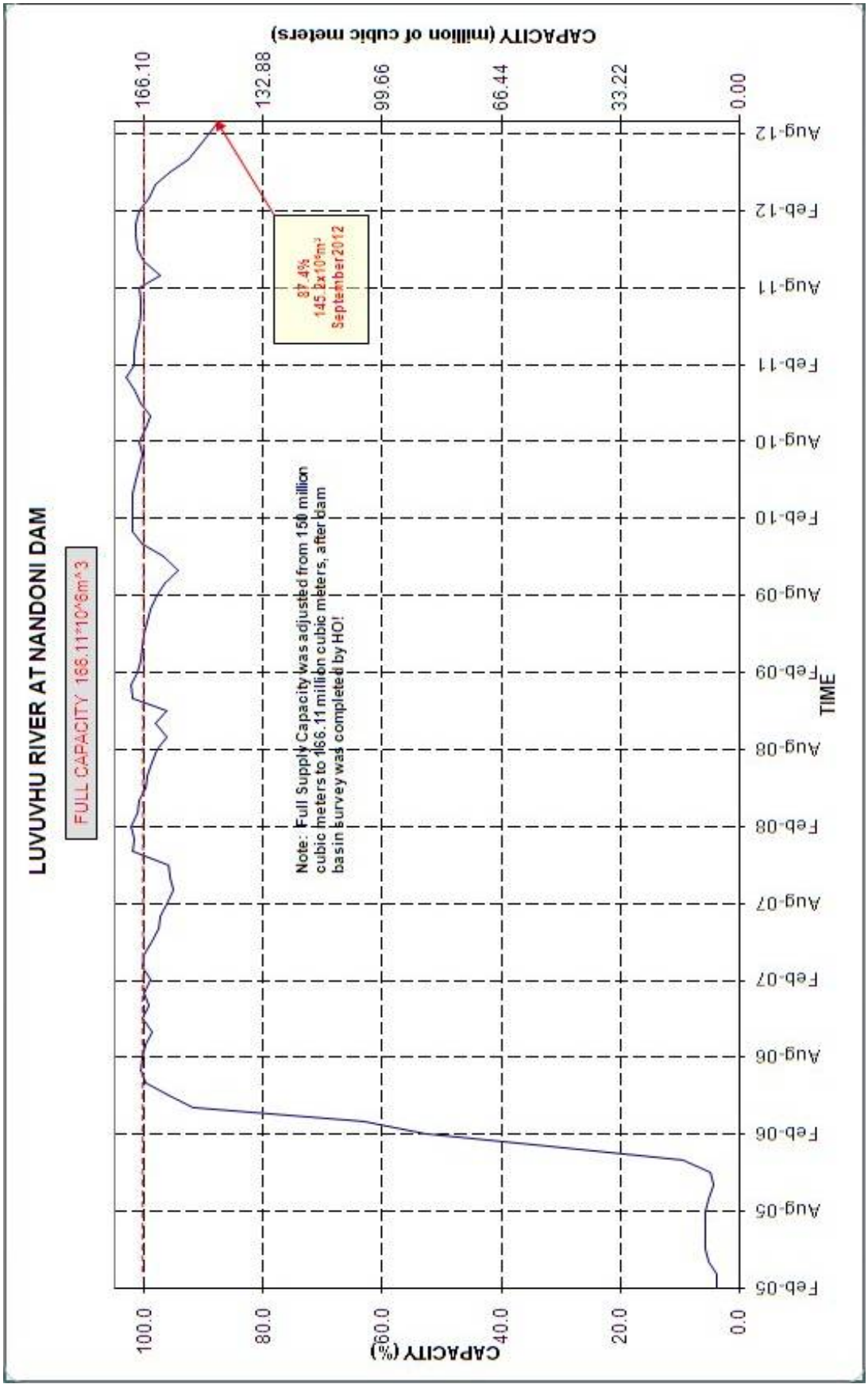

LUPHEPHE RIVER AT LUPHEPHE DAM
FULL CAPACITY 13.984 *10^6m^3
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0
13.98
11.18
8.39
5.59
2.80
0.00
CAPACITY (million of cubic meters)
May-79
May-81
May-83
May-85
May-87
May-89
May-91
May-93
May-95
May-97
May-99
May-01
May-03
May-05
May-07
May-09
May-11
TIME
39.5%
5.1x10^6m^3
September 2012

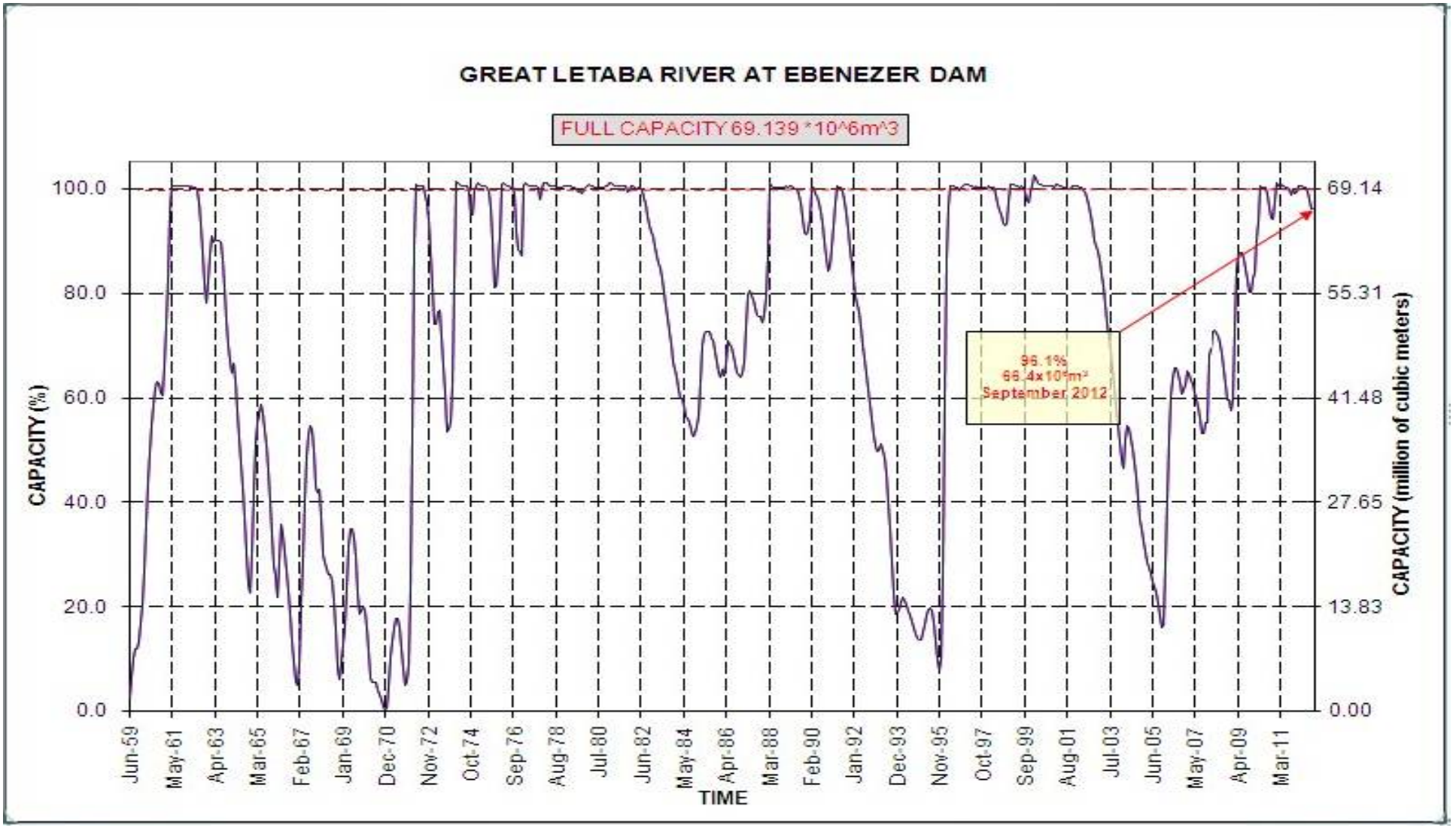

NWANEDZI RIVER AT NWANEDZI DAM
FULL CAPACITY 5.14 *10^6m^3
CAPACITY (million of cubic meters)
5.14
4.11
3.08
2.06
1.03
0.00
46.7%
2.4x10^6m^3
September 2012
Oct-11
Oct-09
Oct-07
Oct-05
Oct-03
Oct-01
Oct-99
Oct-97
Oct-95
Oct-93
Oct-91
Oct-89
Oct-87
Oct-85
Oct-83
Oct-81
Oct-79
TIME
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0

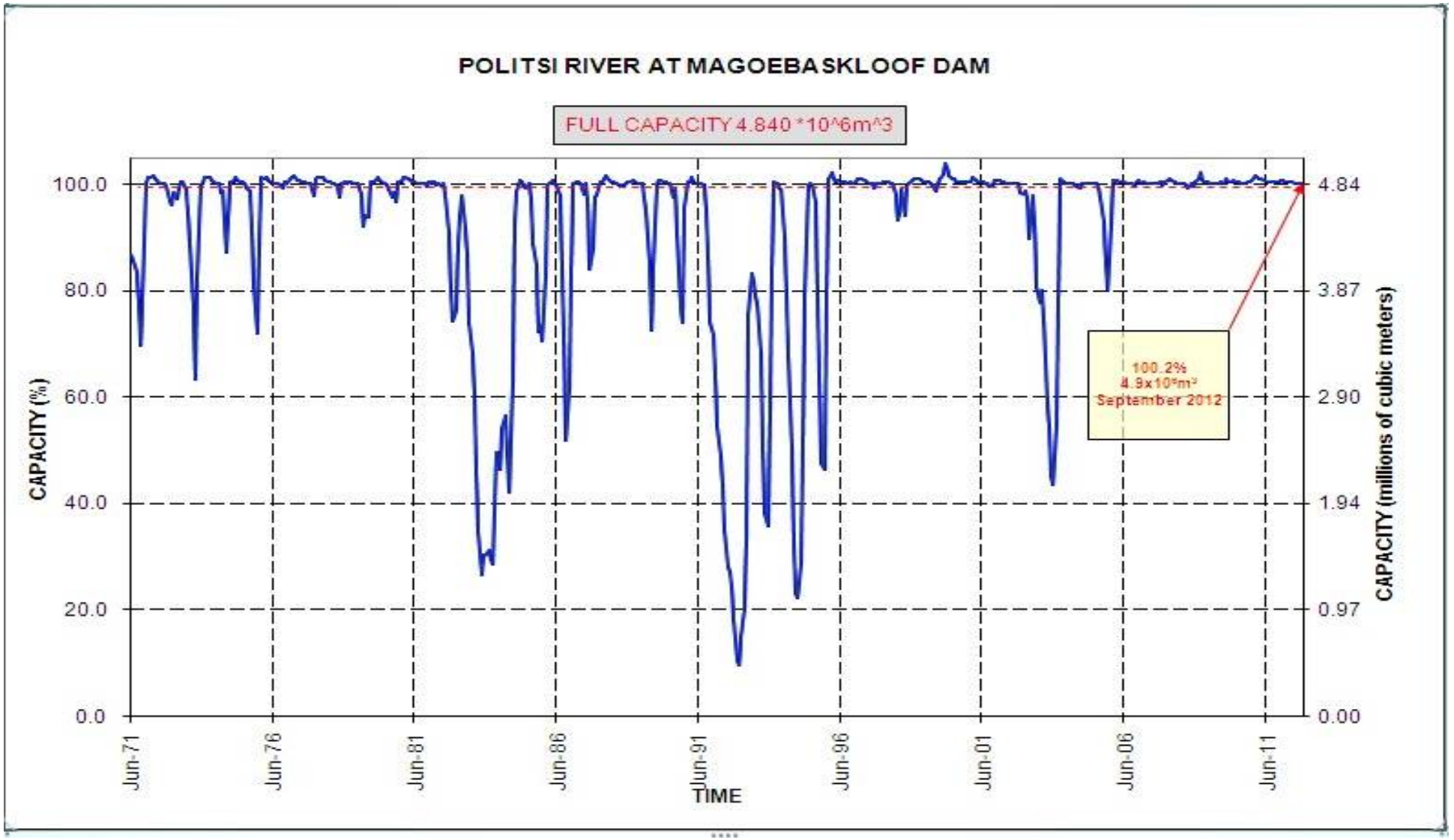

MUTSHEDZI RIVER AT MUTSHEDZI DAM
Data currently under review - 2010 basin survey picked up a discrepancy with Full Supply Level!
FULL CAPACITY 2.34 *10^6m^3
Green line is based on silt survey performed after 2000 flood event. Full capacity volume for this period need to be verified!
64.1 %
1.5x10^6m^3
September 2012
CAPACITY (%)
CAPACITY (million of cubic meters)
TIME
100.0
80.0
60.0
40.0
20.0
0.0
2.34
1.872
1.404
0.936
0.468
0
Jul-90
Jul-91
Jul-92
Jul-93
Jul-94
Jul-95
Jul-96
Jul-97
Jul-98
Jul-99
Jul-00
Jul-01
Jul-02
Jul-03
Jul-04
Jul-05
Jul-06
Jul-07
Jul-08
Jul-09
Jul-10
Jul-11
Jul-12

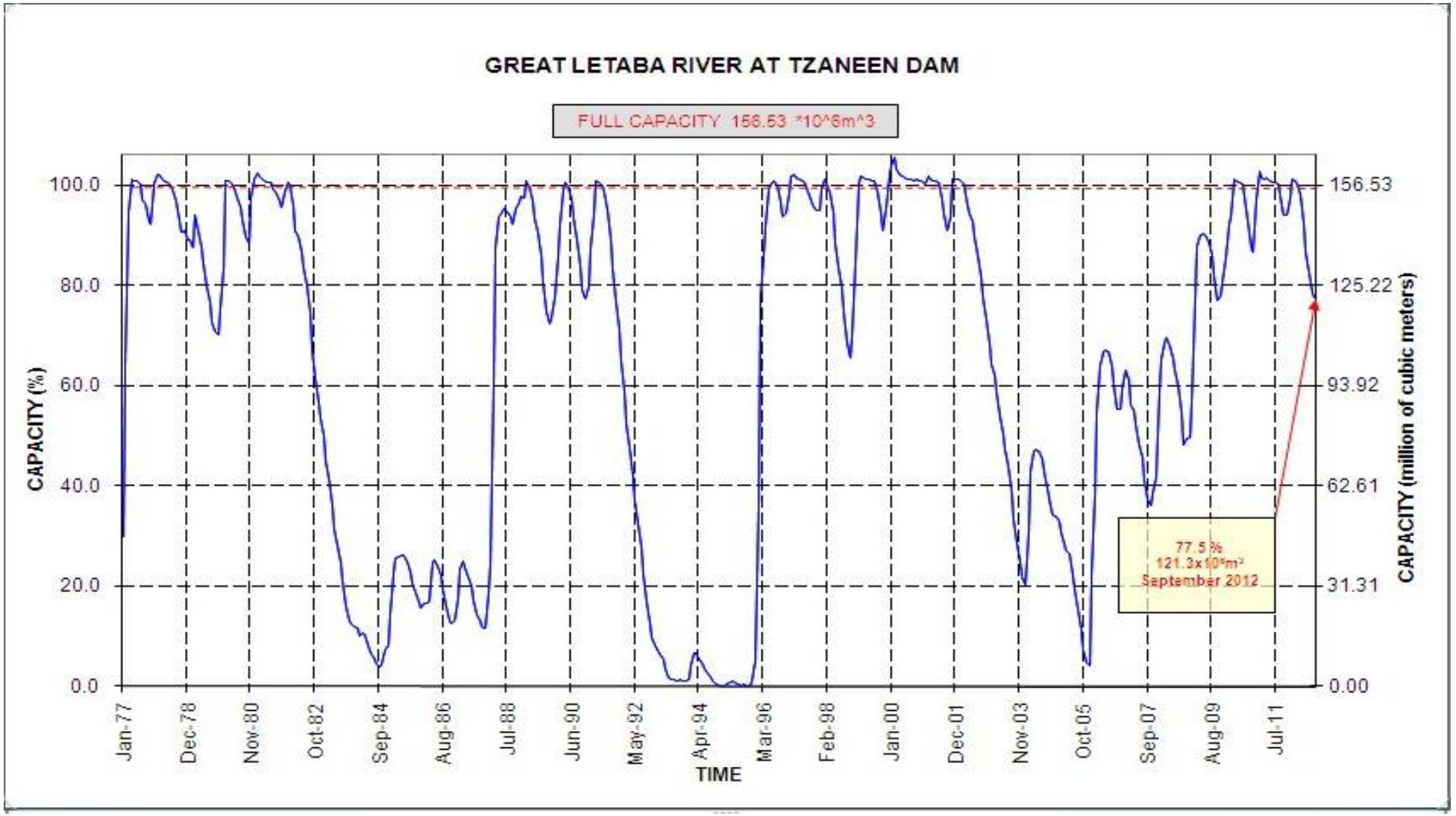

LUVUVHU RIVER AT ALBASINI DAM
FULL CAPACITY 28.21*10^6m^3
CAPACITY (million of cubic meters)
28.21
22.57
16.93
11.28
5.64
0.00
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0
TIME
Oct-10
Oct-08
Oct-06
Oct-04
Oct-02
Oct-00
Oct-98
Oct-96
Oct-94
Oct-92
Oct-90
Oct-88
Oct-86
Oct-84
Oct-82
Oct-80
Oct-78
Oct-76
Oct-74
Oct-72
Oct-70
Oct-68
Oct-66
Oct-64
Oct-62
Oct-60
Oct-58
Oct-56
Oct-54
Oct-52
34.5%
9.7x10^6m^3
September 2012

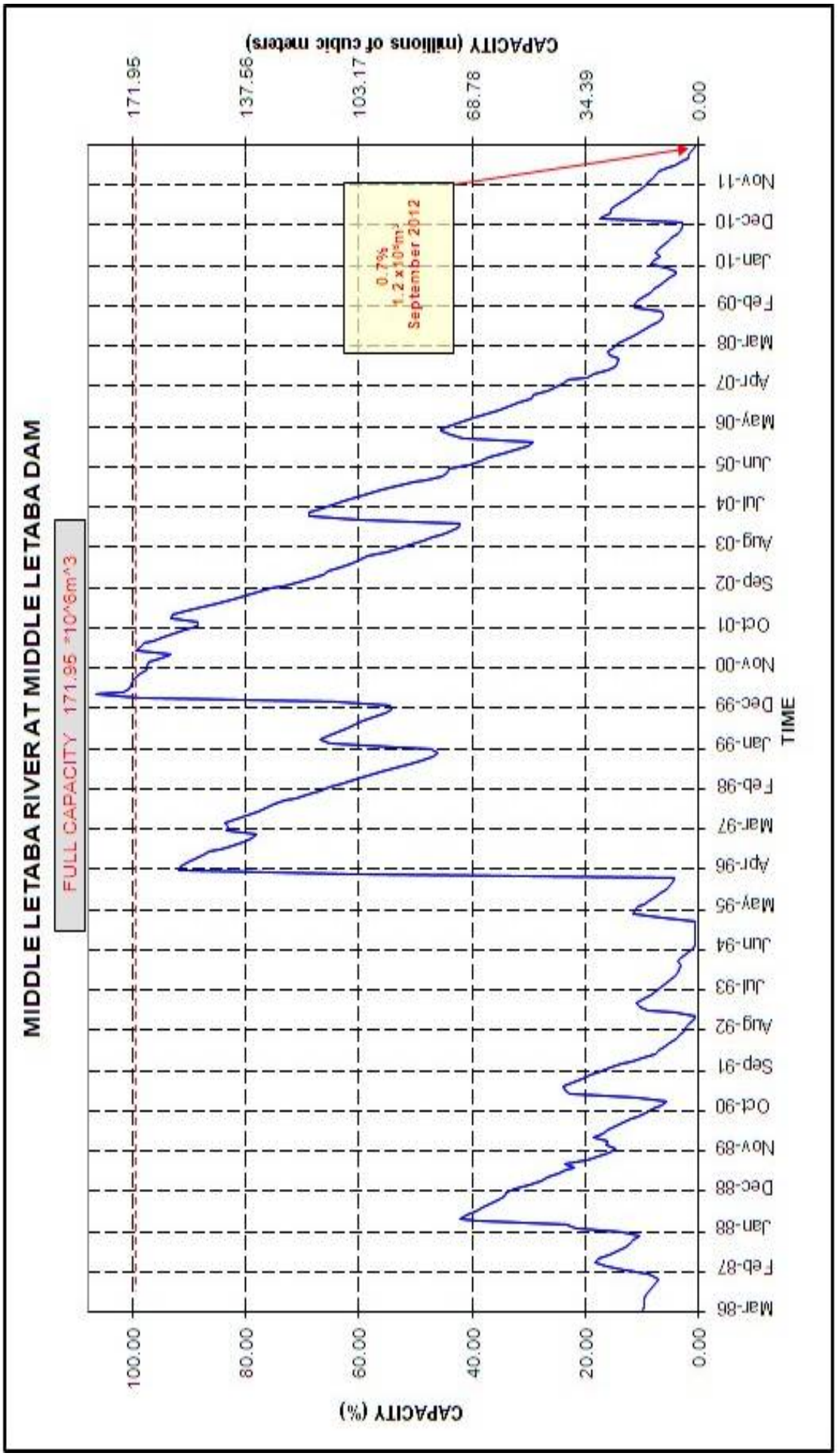

MUTSHINDUDI RIVER AT VONDO DAM
FULL CAPACITY 30.447*10^6m^3
100.0
80.0
60.0
40.0
20.0
0.0
CAPACITY (%)
30.17
24.13
18.10
12.07
6.03
0.00
CAPACITY (million of cubic meters)
75.4%
23.0x10^6m^3
September2012
Dec-93
Dec-94
Dec-95
Dec-96
Dec-97
Dec-98
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
TIME

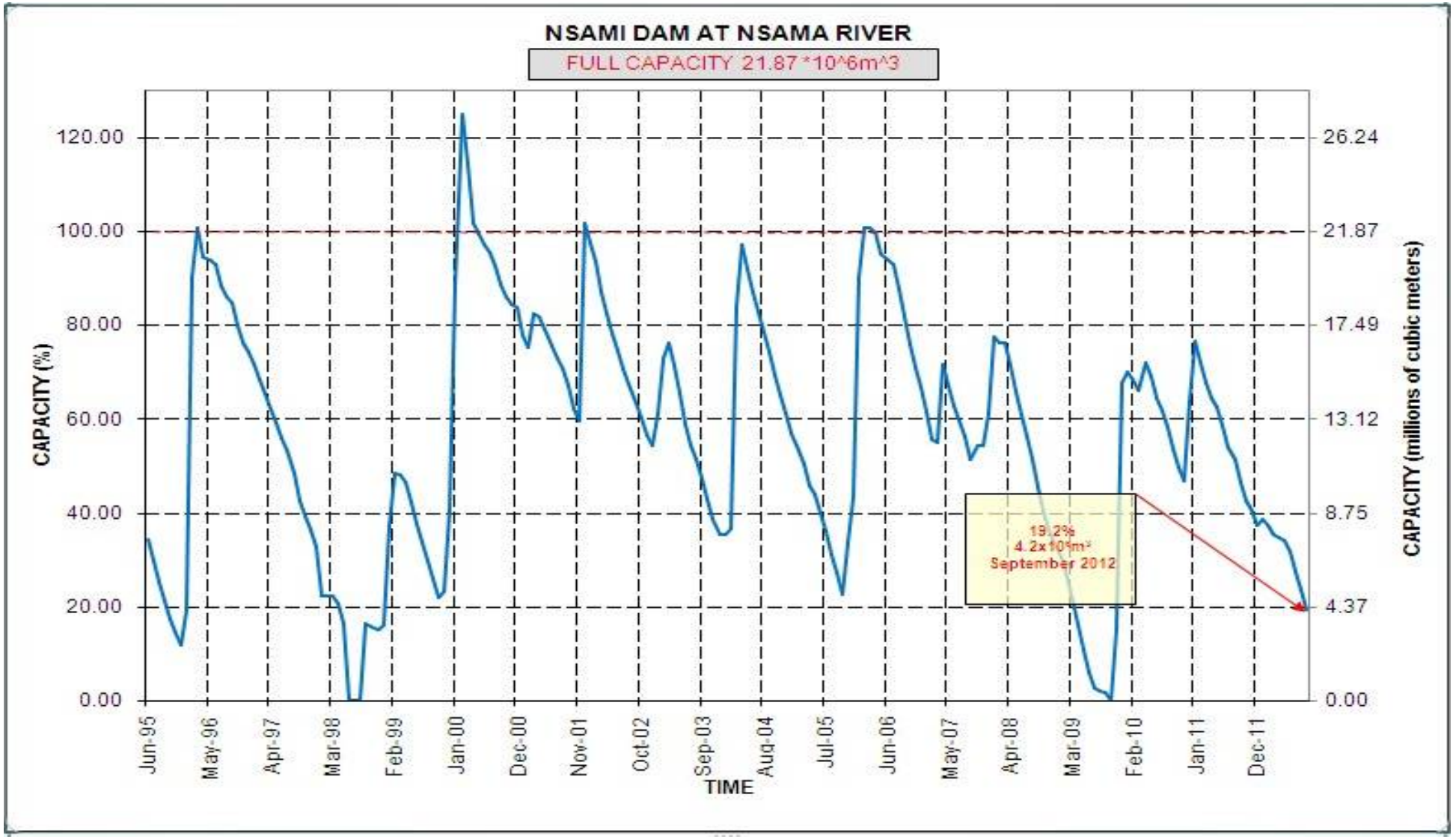

LUVUVHU RIVER AT NANDONI DAM
FULL CAPACITY 166.11*10^6m^3
Note: Full Supply Capacity was adjusted from 150 million cubic meters to 166.11 million cubic meters, after dam basin survey was completed by HO!
87.4%
145.1x10^6m^3
September2012
CAPACITY (%)
CAPACITY (million of cubic meters)
TIME
0.0
20.0
40.0
60.0
80.0
100.0
0.00
33.22
66.44
99.66
132.88
166.10
Feb-05
Aug-05
Feb-06
Aug-06
Feb-07
Aug-07
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Aug-12

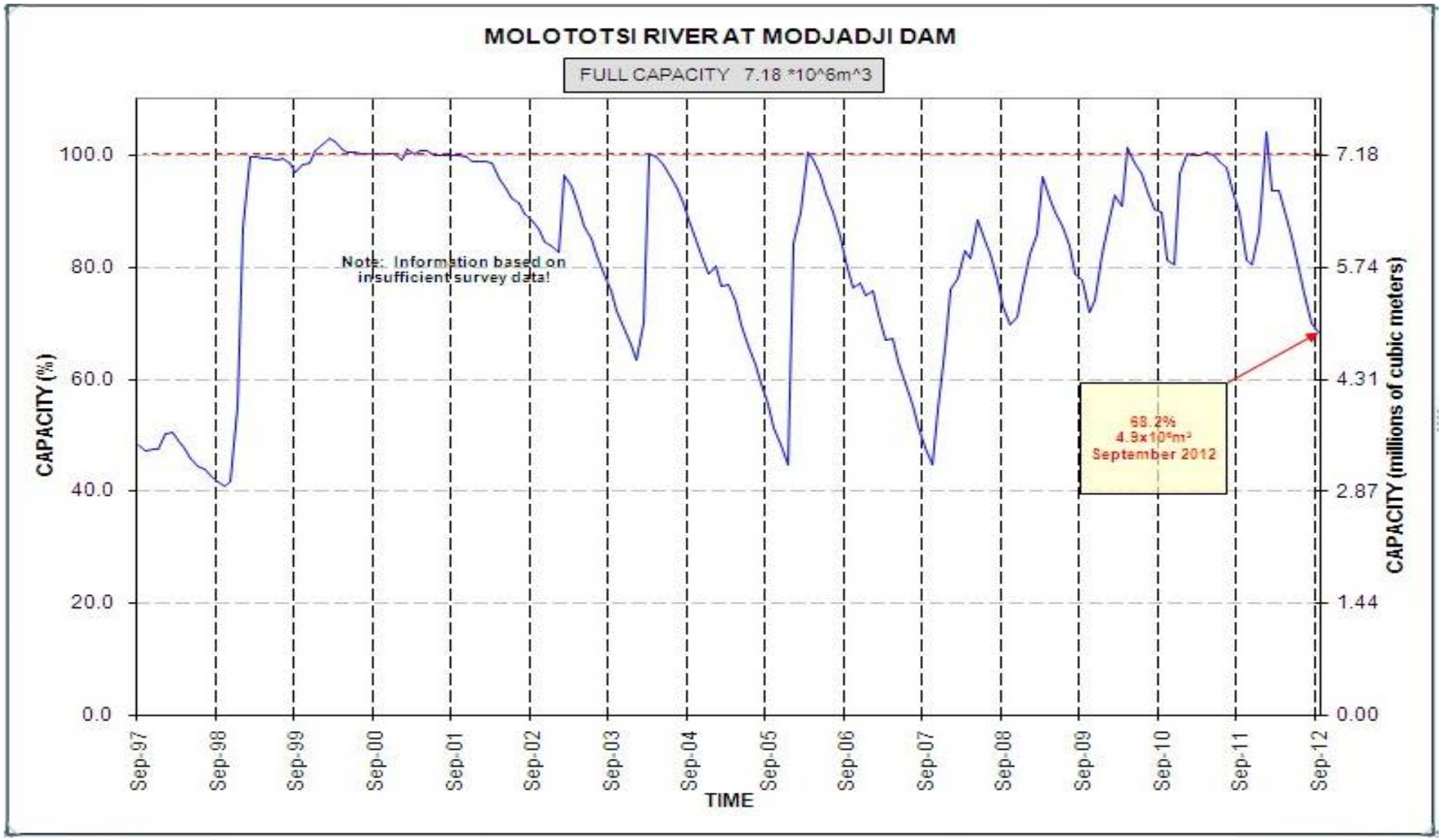

GREAT LETABA RIVER AT EBENEZER DAM
FULL CAPACITY 69.139 *10^6m^3
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0
69.14
55.31
41.48
27.65
13.83
0.00
CAPACITY (million of cubic meters)
96.1%
66.4x10^6m^3
September 2012
Jun-59
May-61
Apr-63
Mar-65
Feb-67
Jan-69
Dec-70
Nov-72
Oct-74
Sep-76
Aug-78
Jul-80
Jun-82
May-84
Apr-86
Mar-88
Feb-90
Jan-92
Dec-93
Nov-95
Oct-97
Sep-99
Aug-01
Jul-03
Jun-05
May-07
Apr-09
Mar-11
TIME

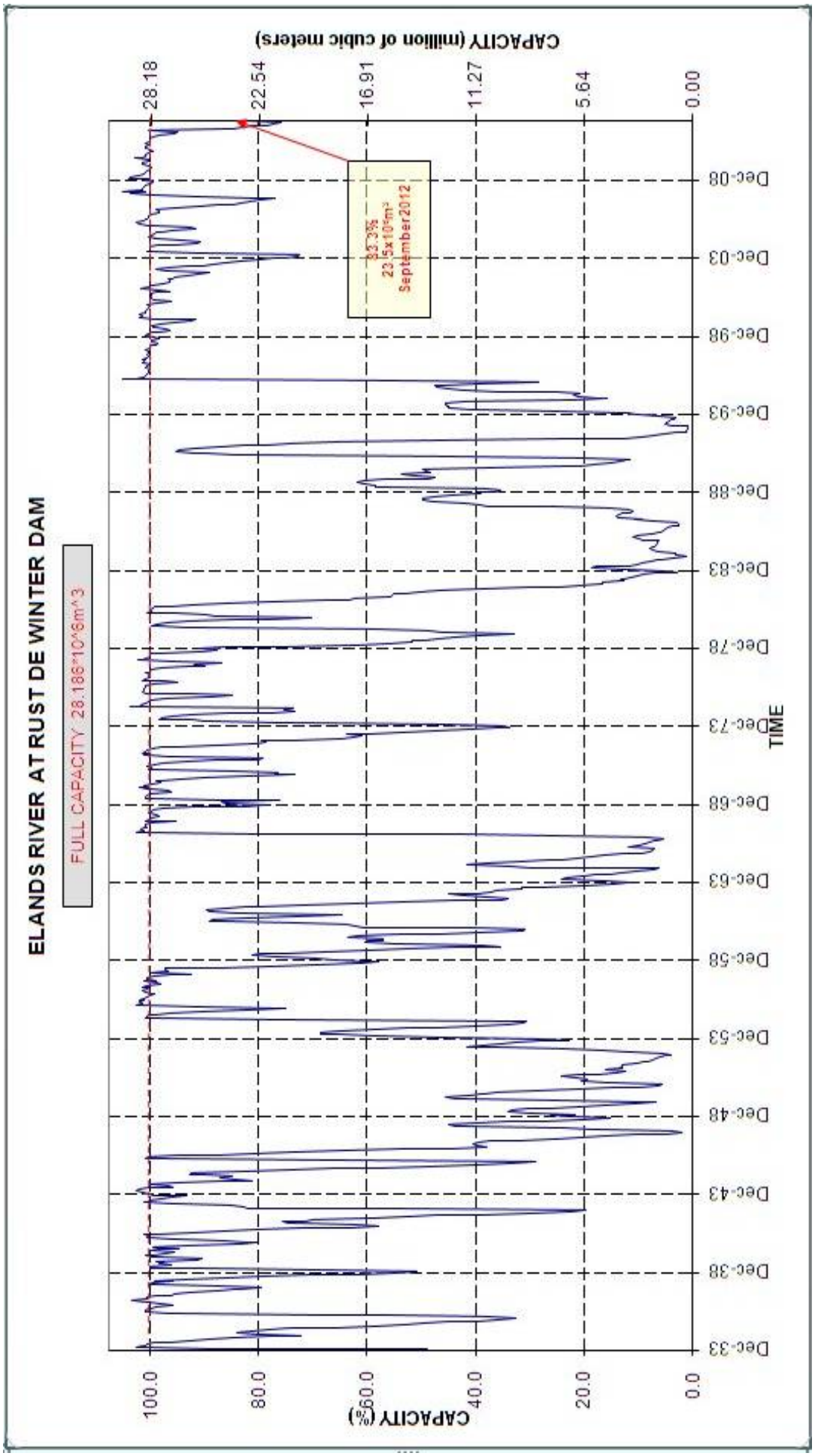

POLITSI RIVER AT MAGOEBASKLOOF DAM
FULL CAPACITY 4.840 *10^6m^3
100.2%
4.9x10⁶m³
September 2012
CAPACITY (%)
CAPACITY (millions of cubic meters)
TIME
100.0
80.0
60.0
40.0
20.0
0.0
4.84
3.87
2.90
1.94
0.97
0.00
Jun-71
Jun-76
Jun-81
Jun-86
Jun-91
Jun-96
Jun-01
Jun-06
Jun-11

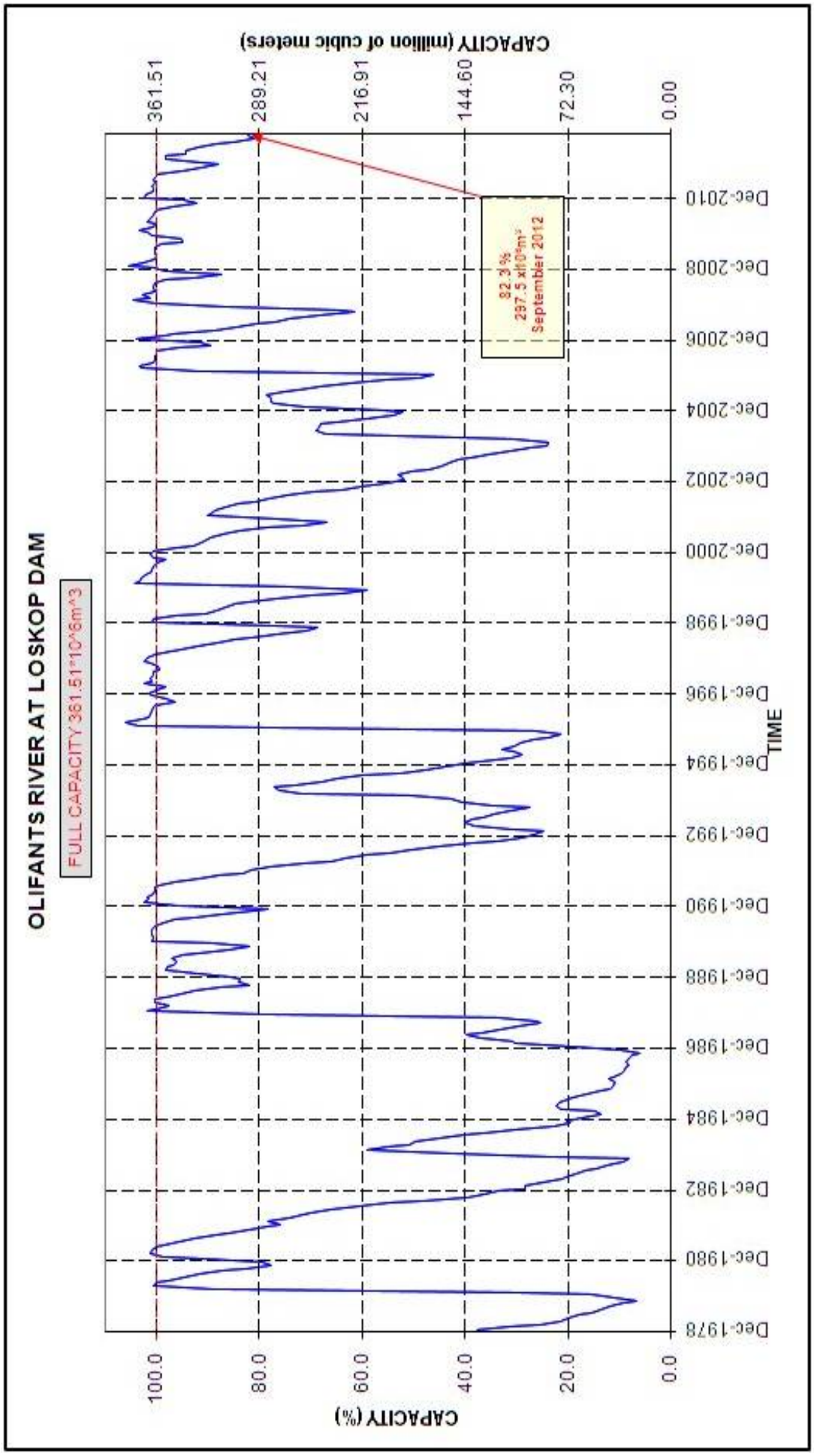

GREAT LETABA RIVER AT TZANEEN DAM
FULL CAPACITY 156.53 *10^6m^3
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0
156.53
125.22
93.92
62.61
31.31
0.00
CAPACITY (million of cubic meters)
77.5 %
121.3x10^6m^3
September 2012
Jan-77
Dec-78
Nov-80
Oct-82
Sep-84
Aug-86
Jul-88
Jun-90
May-92
Apr-94
Mar-96
Feb-98
Jan-00
Dec-01
Nov-03
Oct-05
Sep-07
Aug-09
Jul-11
TIME

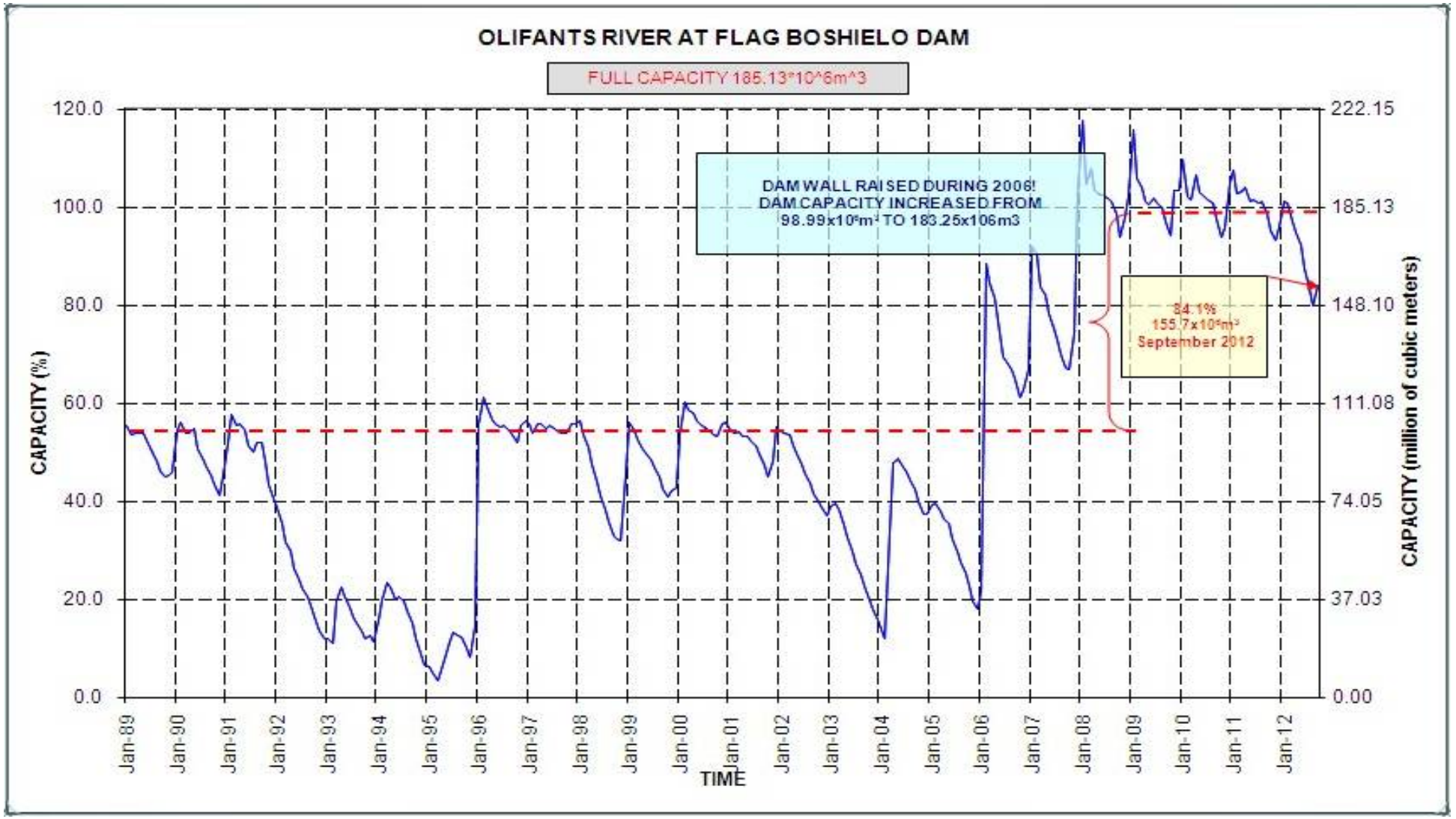

MIDDLE LETABA RIVER AT MIDDLE LETABA DAM
FULL CAPACITY 171.95 *10^6m^3
0.7%
1.2 x10^6m^3
September 2012
CAPACITY (%)
100.00
80.00
60.00
40.00
20.00
0.00
CAPACITY (millions of cubic meters)
171.95
137.56
103.17
68.78
34.39
0.00
TIME
Mar-86
Feb-87
Jan-88
Dec-88
Nov-89
Oct-90
Sep-91
Aug-92
Jul-93
Jun-94
May-95
Apr-96
Mar-97
Feb-98
Jan-99
Dec-99
Nov-00
Oct-01
Sep-02
Aug-03
Jul-04
Jun-05
May-06
Apr-07
Mar-08
Feb-09
Jan-10
Dec-10
Nov-11

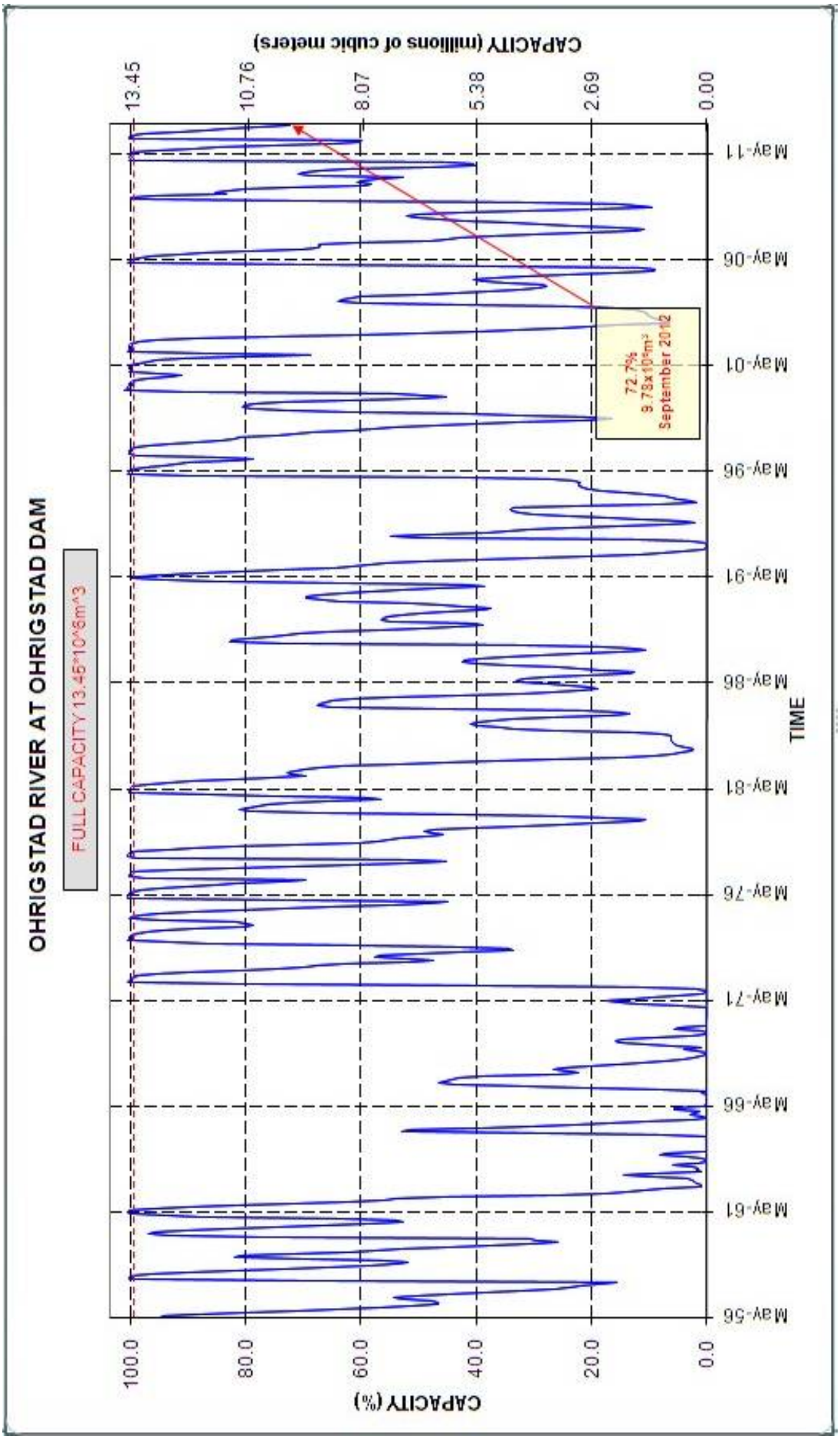

NSAMI DAM AT NSAMA RIVER
FULL CAPACITY 21.87*10^6m^3
CAPACITY (%)
120.00
100.00
80.00
60.00
40.00
20.00
0.00
CAPACITY (millions of cubic meters)
26.24
21.87
17.49
13.12
8.75
4.37
0.00
19.2%
4.2x10^6m^3
September 2012
Jun-95
May-96
Apr-97
Mar-98
Feb-99
Jan-00
Dec-00
Nov-01
Oct-02
Sep-03
Aug-04
Jul-05
Jun-06
May-07
Apr-08
Mar-09
Feb-10
Jan-11
Dec-11
TIME

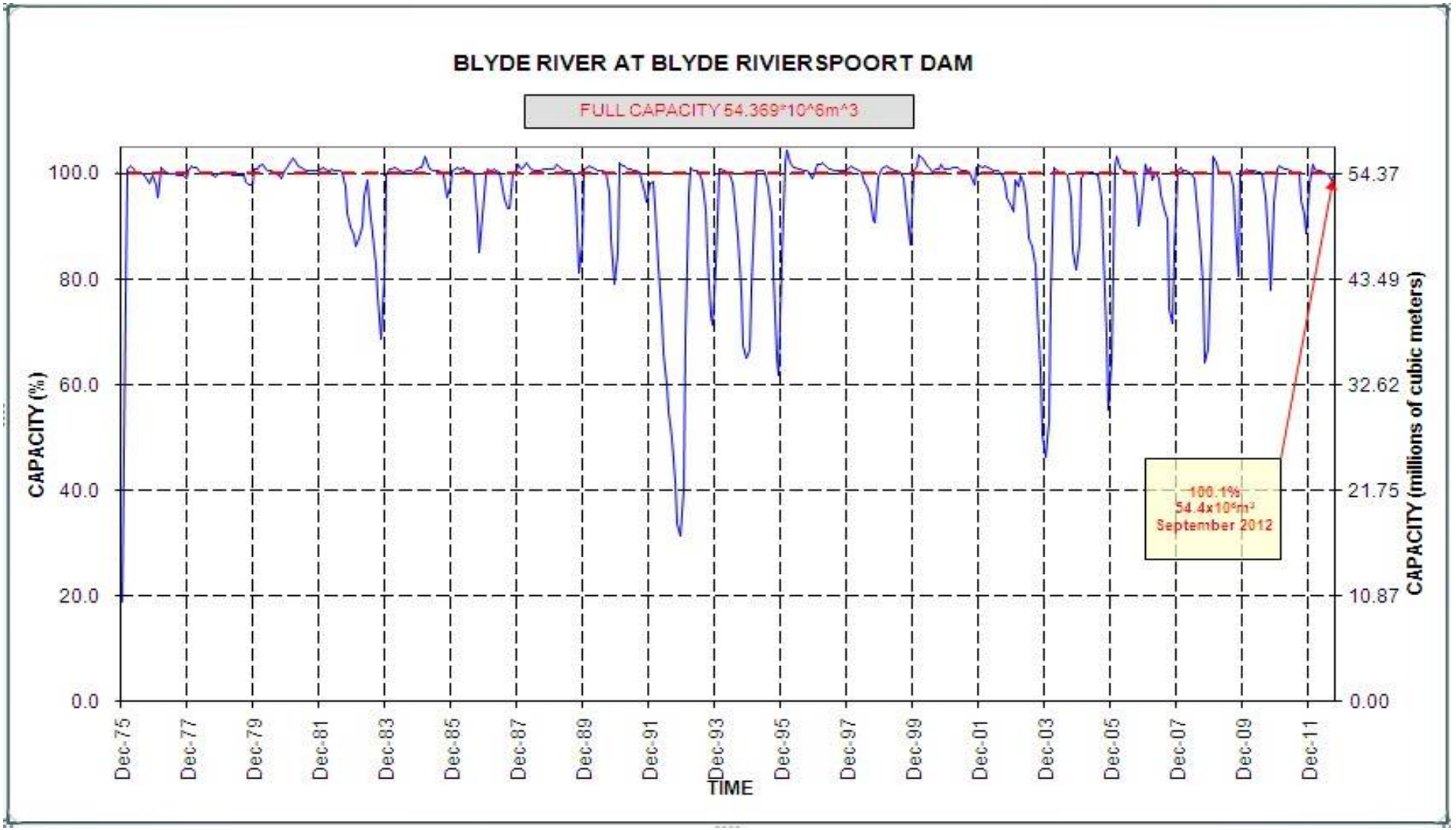

MOLOTOTSI RIVER AT MODJADJI DAM
FULL CAPACITY 7.18 *10^6m^3
Note: Information based on insufficient survey data!
68.2%
4.9x10^6m^3
September 2012
CAPACITY (%)
CAPACITY (millions of cubic meters)
TIME
100.0
80.0
60.0
40.0
20.0
0.0
7.18
5.74
4.31
2.87
1.44
0.00
Sep-97
Sep-98
Sep-99
Sep-00
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12

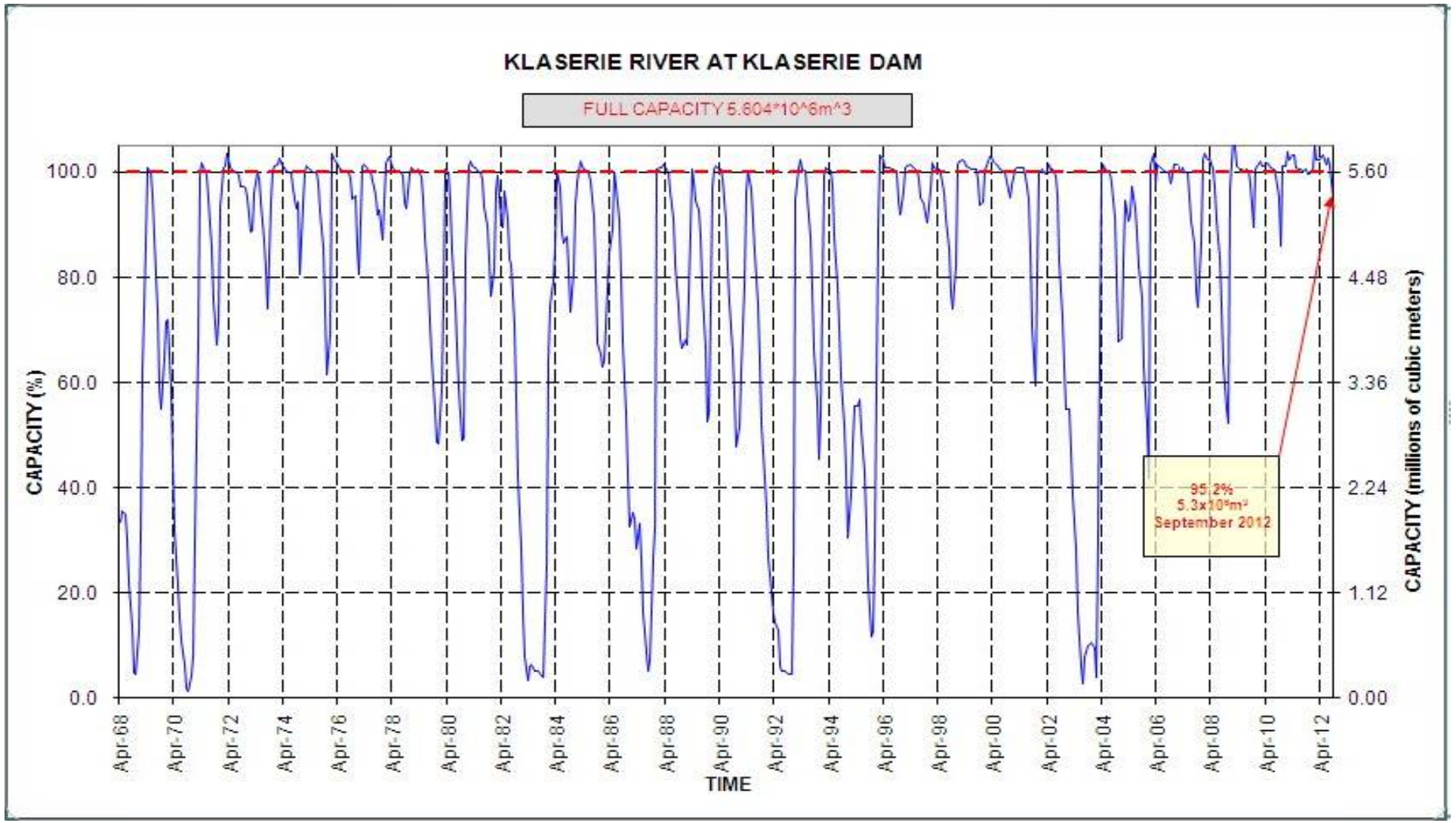

ELANDS RIVER AT RUST DE WINTER DAM
FULL CAPACITY: 28.186*10^6m^3
CAPACITY (million of cubic meters)
28.18
22.54
16.91
11.27
5.64
0.00
33.3%
23.5x10^6m^3
September2012
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0
TIME
Dec-08
Dec-03
Dec-98
Dec-93
Dec-88
Dec-83
Dec-78
Dec-73
Dec-68
Dec-63
Dec-58
Dec-53
Dec-48
Dec-43
Dec-38
Dec-33

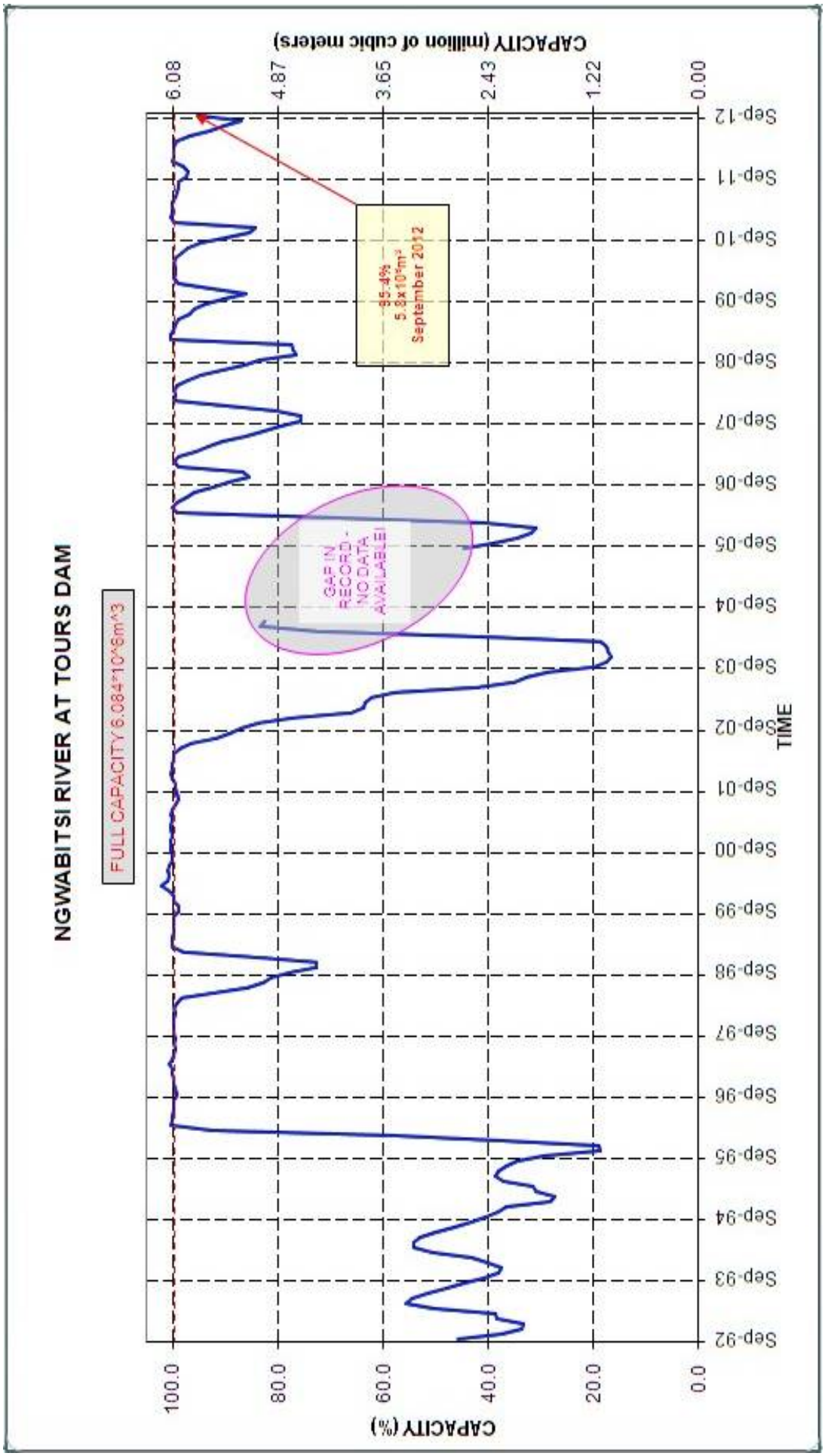

OLIFANTS RIVER AT LOSKOP DAM
FULL CAPACITY 361.51*10^6m^3
CAPACITY (million of cubic meters)
361.51
289.21
216.91
144.60
72.30
0.00
82.3 %
297.5 x10^6m^3
September 2012
Dec-2010
Dec-2008
Dec-2006
Dec-2004
Dec-2002
Dec-2000
Dec-1998
Dec-1996
Dec-1994
Dec-1992
Dec-1990
Dec-1988
Dec-1986
Dec-1984
Dec-1982
Dec-1980
Dec-1978
TIME
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0

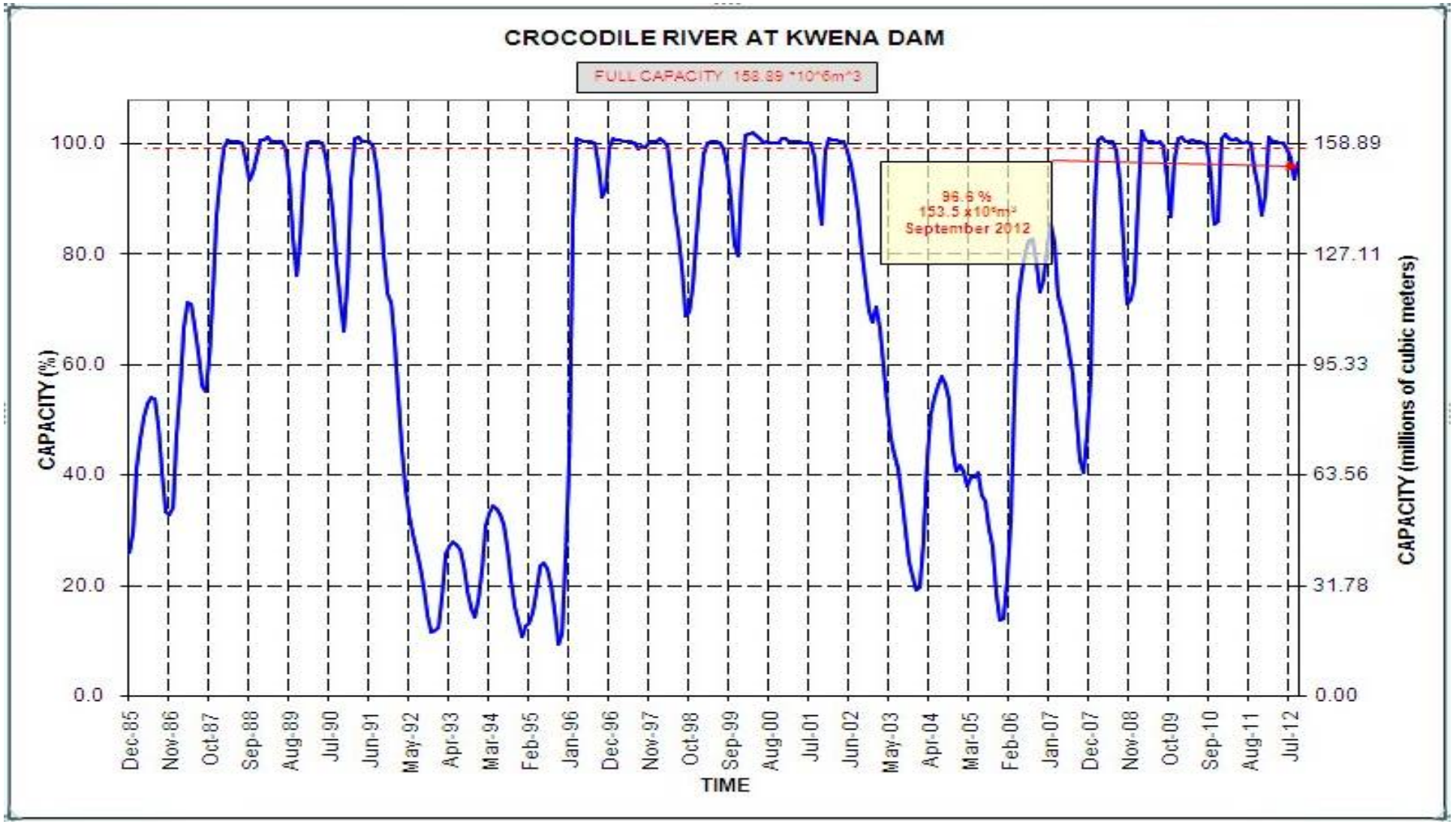

OLIFANTS RIVER AT FLAG BOSHIELO DAM
FULL CAPACITY 185.13*10^6m^3
DAM WALL RAISED DURING 2006!
DAM CAPACITY INCREASED FROM
98.99x10⁶m³ TO 183.25x106m3
84.1%
155.7x10⁶m³
September 2012
CAPACITY (%)
CAPACITY (million of cubic meters)
TIME
120.0
100.0
80.0
60.0
40.0
20.0
0.0
222.15
185.13
148.10
111.08
74.05
37.03
0.00
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12

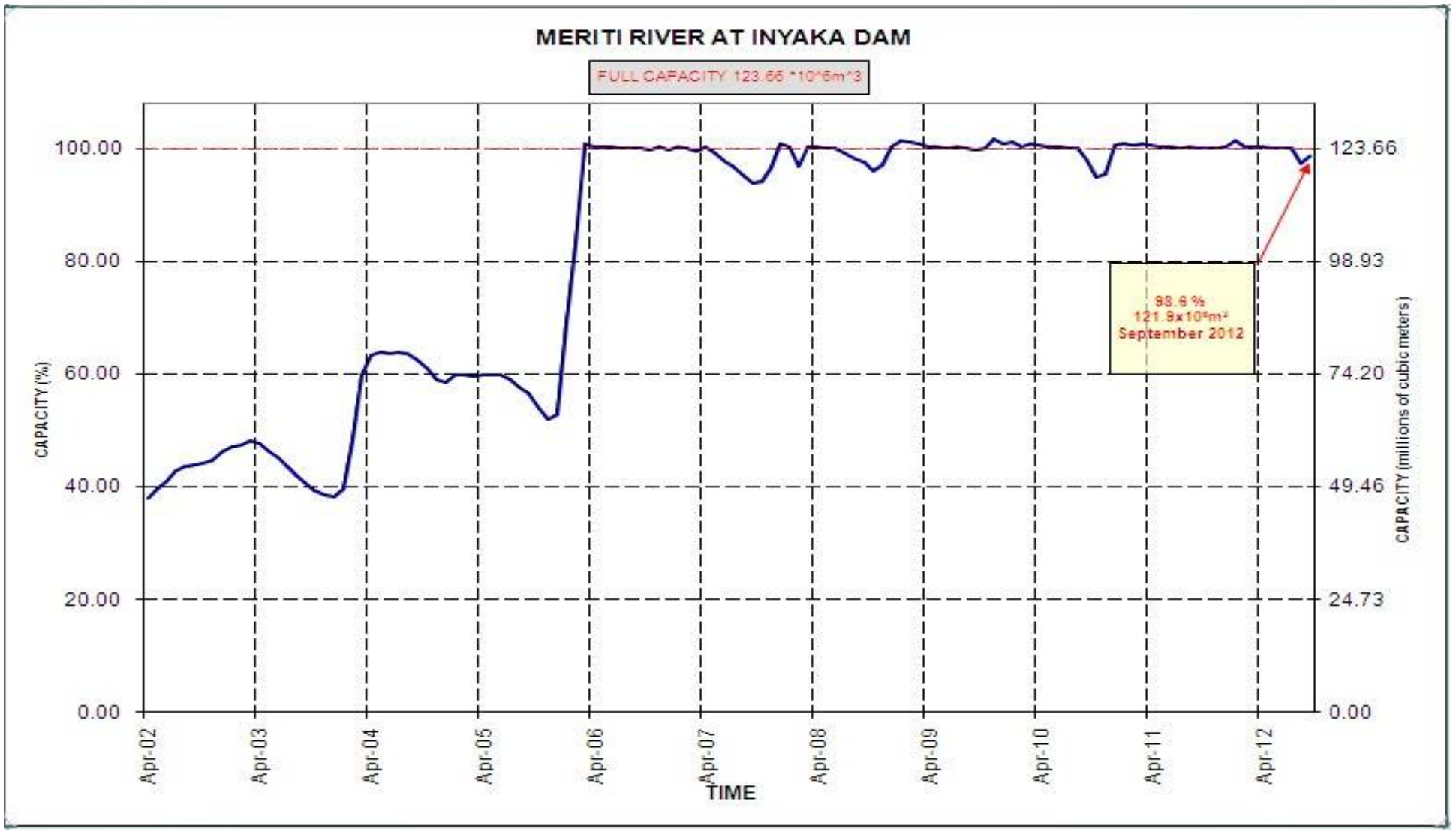

OHRIGSTAD RIVER AT OHRIGSTAD DAM
FULL CAPACITY 13.45*10^6m^3
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0
CAPACITY (millions of cubic meters)
13.45
10.76
8.07
5.38
2.69
0.00
72.7%
9.78x10^6m^3
September 2012
May-11
May-06
May-01
May-96
May-91
May-86
May-81
May-76
May-71
May-66
May-61
May-56
TIME


BLYDE RIVER AT BLYDE RIVIERSPOORT DAM
FULL CAPACITY 54.369*10^6m^3
CAPACITY (%)
100.0
80.0
60.0
40.0
20.0
0.0
54.37
43.49
32.62
21.75
10.87
0.00
CAPACITY (millions of cubic meters)
100.1%
54.4x10^6m^3
September 2012
Dec-75
Dec-77
Dec-79
Dec-81
Dec-83
Dec-85
Dec-87
Dec-89
Dec-91
Dec-93
Dec-95
Dec-97
Dec-99
Dec-01
Dec-03
Dec-05
Dec-07
Dec-09
Dec-11
TIME


KLASERIE RIVER AT KLASERIE DAM
FULL CAPACITY 5.604*10^6m^3
CAPACITY (%)
CAPACITY (millions of cubic meters)
100.0
80.0
60.0
40.0
20.0
0.0
5.60
4.48
3.36
2.24
1.12
0.00
95.2%
5.3x10^6m^3
September 2012
Apr-68
Apr-70
Apr-72
Apr-74
Apr-76
Apr-78
Apr-80
Apr-82
Apr-84
Apr-86
Apr-88
Apr-90
Apr-92
Apr-94
Apr-96
Apr-98
Apr-00
Apr-02
Apr-04
Apr-06
Apr-08
Apr-10
Apr-12
TIME


NGWABITSI RIVER AT TOURS DAM
FULL CAPACITY 6.084*10^6m^3
GAP IN RECORD - NO DATA AVAILABLE!
85.4%
5.8x10^6m³
September 2012
CAPACITY (%)
CAPACITY (million of cubic meters)
TIME
100.0
80.0
60.0
40.0
20.0
0.0
6.08
4.87
3.65
2.43
1.22
0.00
Sep-92
Sep-93
Sep-94
Sep-95
Sep-96
Sep-97
Sep-98
Sep-99
Sep-00
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12


CROCODILE RIVER AT KWENA DAM
FULL CAPACITY 158.89 *10^6m^3
96.6 %
153.5 x10^6m^3
September 2012
CAPACITY (%)
CAPACITY (millions of cubic meters)
100.0
80.0
60.0
40.0
20.0
0.0
158.89
127.11
95.33
63.56
31.78
0.00
Dec-85
Nov-86
Oct-87
Sep-88
Aug-89
Jul-90
Jun-91
May-92
Apr-93
Mar-94
Feb-95
Jan-96
Dec-96
Nov-97
Oct-98
Sep-99
Aug-00
Jul-01
Jun-02
May-03
Apr-04
Mar-05
Feb-06
Jan-07
Dec-07
Nov-08
Oct-09
Sep-10
Aug-11
Jul-12
TIME


MERITI RIVER AT INYAKA DAM
FULL CAPACITY 123.66 *10^6m^3
100.00
80.00
60.00
40.00
20.00
0.00
CAPACITY (%)
123.66
98.93
74.20
49.46
24.73
0.00
CAPACITY (millions of cubic meters)
98.6 %
121.9x10^6m^3
September 2012
Apr-02
Apr-03
Apr-04
Apr-05
Apr-06
Apr-07
Apr-08
Apr-09
Apr-10
Apr-11
Apr-12
TIME