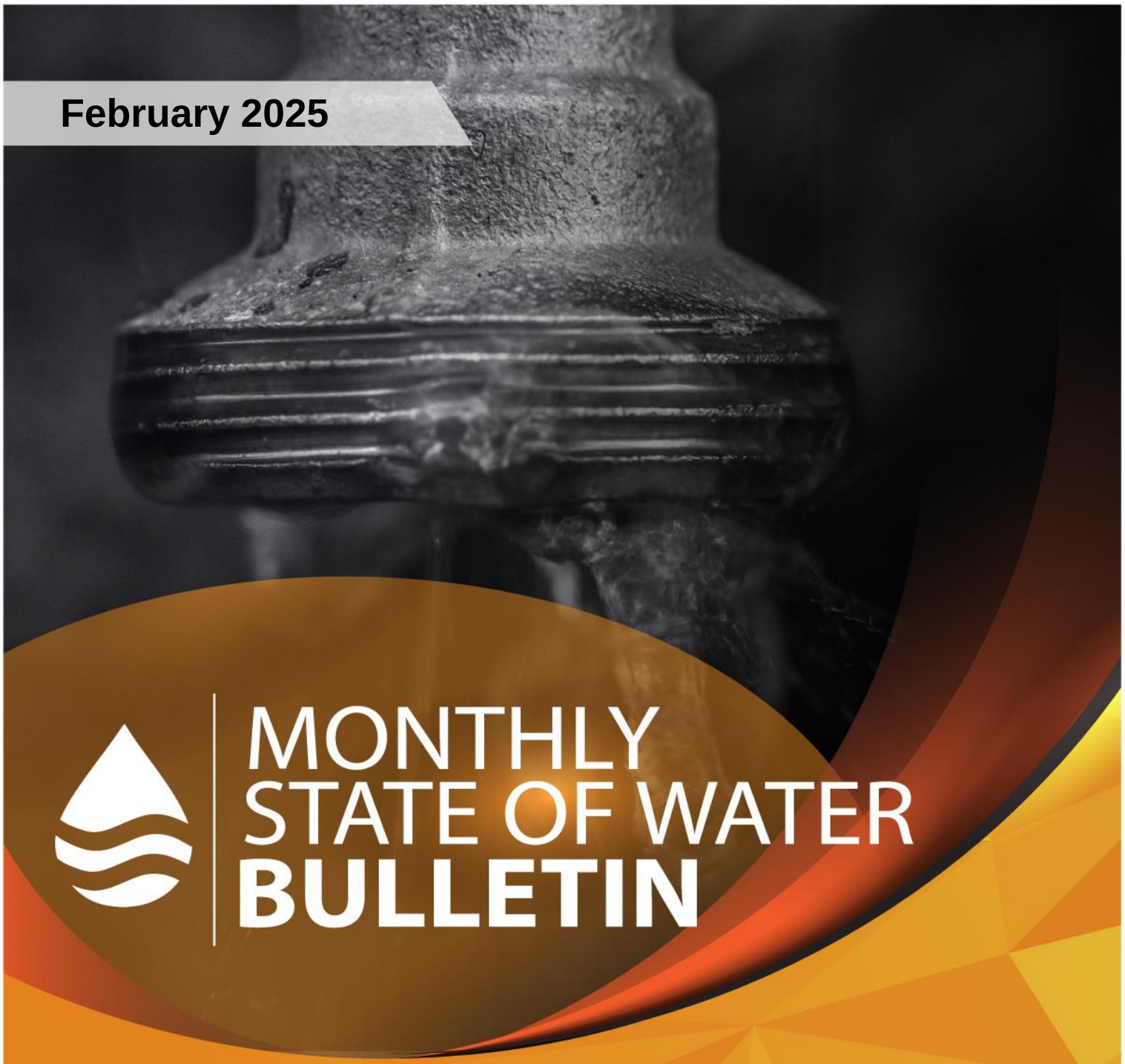
February 2025



MONTHLY STATE OF WATER BULLETIN

WATER IS LIFE - SANITATION IS DIGNITY

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2030 NDP

Overview

South Africa experiences varying weather conditions with different rainfall seasons due to its unique geographical location and long coastline spanning 2,800 kilometres. The cold Atlantic Ocean on the west coast and the warmer Indian Ocean on the south and east coasts significantly influence both the climatic and weather conditions. The country's southwestern tip has a Mediterranean climate with hot, dry summers and cool, wet winters. Winter rainfall occurs in the southwestern parts of the country and summer rainfall occurs in the eastern parts.

The El Niño-Southern Oscillation (ENSO) has recently crossed the La Niña threshold and is predicted to remain on the boundary of this threshold for the next few months. SAWS indicates that current predictions are still uncertain, with multiple global models predicting different directions (either strengthening the La Niña state or moving back to a Neutral state). At the end of February 2025, at least 42.3% of the national dams were above 100% of FSC (either full or spilling), while 50.9% were between 50 and 100% of FSC, 5.8% were between 10 and 50% of FSC, and 1.0% were below 10% of FSC (critically low).

The most recent 24-month Standardised Precipitation Index (SPI) revealed that several District Municipalities (DM) experienced severe drought in the last 24 Months, including the ZF Mgcawu DM in Northern Cape, Bojanala DM in North West, Thabo Mafutsanyane DM in Free State, Gert Sibande DM in Mpumalanga, and Capricorn and Mopani DMs in Limpopo. Moreover, district municipalities such as the Zululand DM in KwaZulu-Natal, Ngaka Modiri Molema DM in North-West, Sekhukhune DM in Limpopo, and Sedibeng DM in Gauteng only experienced moderate drought.

Floods are the most commonly documented disasters in southern Africa, and South Africa is no exception, having experienced 77 significant floods between 1980 and 2010. The province of KwaZulu-Natal has endured catastrophic natural disasters, notably floods, leading to considerable fatalities, property destruction, and infrastructure disruption, with the 2022 floods ranking among the deadliest in the province's history. In February 2025, the province encountered additional flooding and mudslide incidents.

The collaborative maintenance operation being carried out by the Trans-Caledon Tunnel Authority (TCTA) and the Lesotho Highlands Development Agency (LHDA) is in progress. It commenced after the closure of the tunnel system on 1 October 2024. This essential undertaking aims to ensure the long-term functionality and safety of the tunnel infrastructure, which plays a vital role in the region's water supply. The goal is to reinforce the infrastructure to withstand the test of time and ensure reliable operation for the next 20 to 30 years.

National Dam Storage

The national water storage trends for the current hydrological year 2024/25 against the past four hydrological years are presented in Figure 1. With all the rainfall in February 2025, the dam storage figures have significantly improved. At the end of February 2025, the national dam levels were 85.7% of Full Supply Capacity (FSC). This level is lower than last year same time when the storage levels were at 89.4% of FSC.

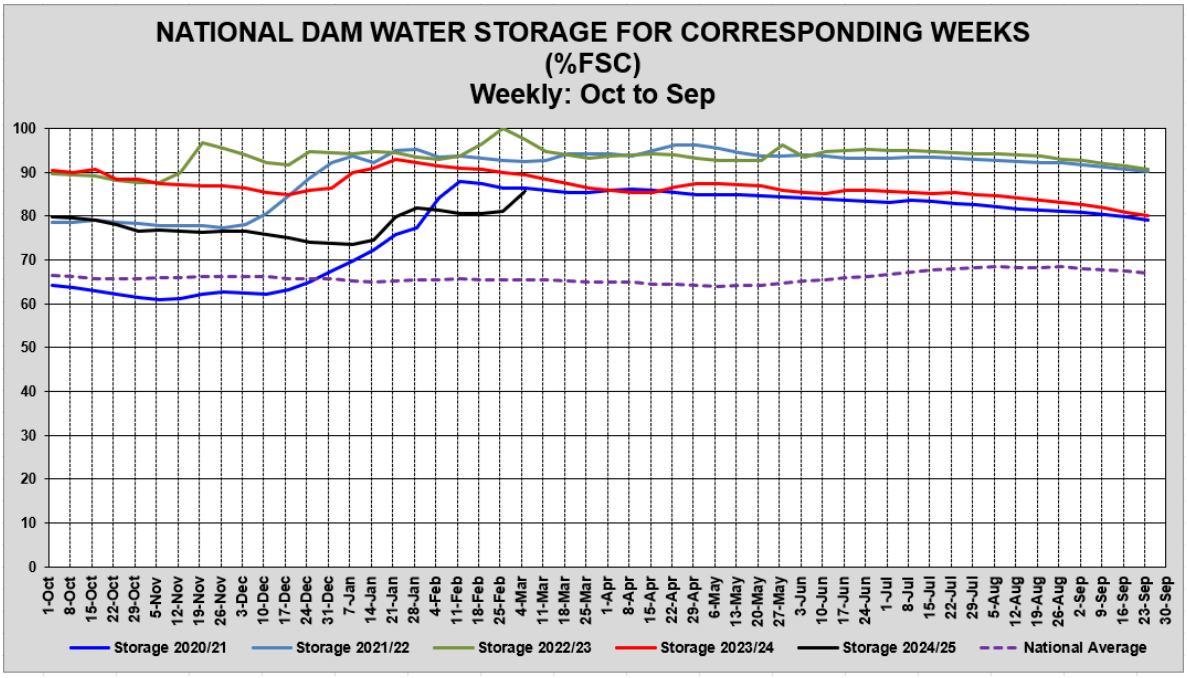


Figure 1: National Dam Storage at the end of February 2025

At least **42.3%** of the national dams were above 100% of FSC (either full or spilling), while **50.9%** were between 50 and 100% of FSC, **5.8%** were between 10 and 50% of FSC, and **1.0%** were below 10% of FSC (critically low). The comparison between February 2024 and February 2025 of the country's five largest dam storage (% of FSC) is presented in Table 1. The Vaal Dam, one of the country's largest dams is at an impressive 83.5% of FSC. Persistent heavy rains in January and February 2025 have significantly boosted the dam's levels from 24.1% at the beginning of January 2025. Improvements have also been observed at the Middle-Letaba Dam in Limpopo, which gained 6.2% to reach 9% of FSC, year-on-year (Table 2). While the Leeugamka Dam in the Western Cape gained 8.8% to reach 9.1% of FSC, year-on-year.

Table 1: Storage Levels comparison for the Five Largest storage dams (by volume) to last year

Reservoir	River	Province	Full Supply Capacity (Mm^3)	24 February 2024 (% FSC)	24 February 2025 (% FSC)	Difference (%)
Gariep Dam	Orange River	Free State	4903.45	94.0	81.3	-12.7
Vanderkloof Dam	Orange River	Free State	3136.93	98.3	68.5	-29.8
Sterkfontein Dam	Nuwejaarspruit River	Free State	2616.90	100	98.5	-1.5
Vaal Dam	Vaal River	Free State	2560.97	68.3	83.5	+15.2
Pongolapoort Dam	Phongolo River	KwaZulu-Natal	2395.24	82.3	88.6	+6.3

Table 2: Dams currently below 10% of Full Supply Capacity compared to last year

Reservoir	River	Province	Full Supply Capacity (Mm^3)	24 February 2024 % FSC)	27 February 2025 (% FSC)	Difference (%)
Leeugamka Dam	Leeu River	Western Cape	13.41	0.3	9.1	+8.8
Middel-Letaba Dam	Middel-Letaba River	Limpopo	171.93	2.8	9.0	+6.2

The spatial distribution of the dams showing the classified range of their storage levels as of 28 February 2025 is presented in Figure 2. The majority of national dams across the country were at storage levels of between 50 and 100% of FSC.

Figure 3 presents the 24-month Standardised Precipitation Index (SPI) for January 2025. Extreme drought status is indicated in some parts of Thabo Mofutsanyana and ZF Mgcawu DMs. Severe drought status is indicated in several district municipalities in the last 24 months including ZF Mgcawu in the Northern Cape, Bojanala in North West, Ngaka Modiri Molema in the North West Thabo Mafutsanyane in the Free State, Gert Sibande in Mpumalanga, and Sedibeng in Gauteng. District municipalities such as Zululand DM in KwaZulu-Natal, Ngaka Modiri Molema DM in North-West, Sekhukhune DM in Limpopo, and Sedibeng DM in Gauteng only experienced moderate drought.

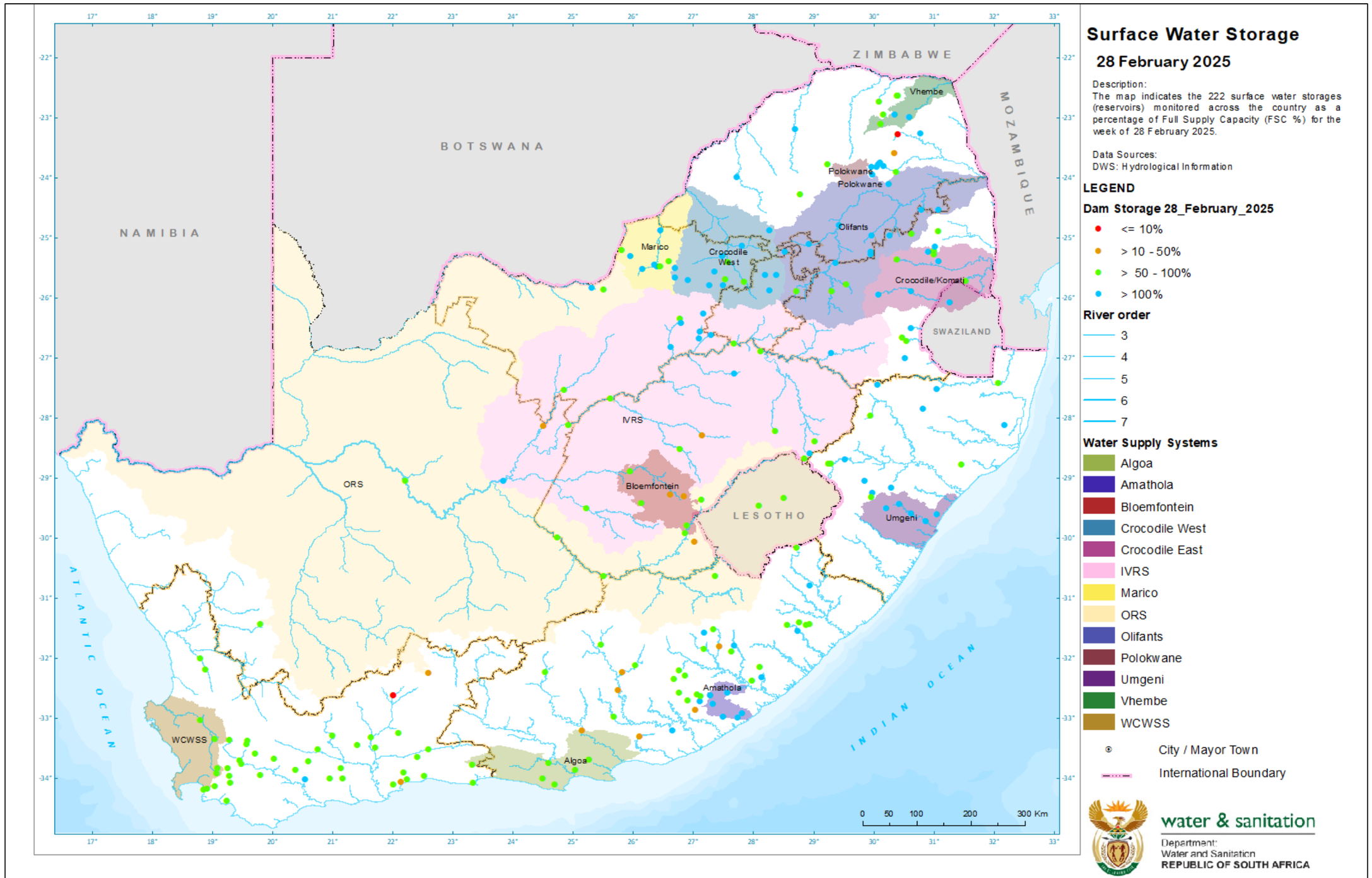


Figure 2: Surface Water Storage Levels – February 2025

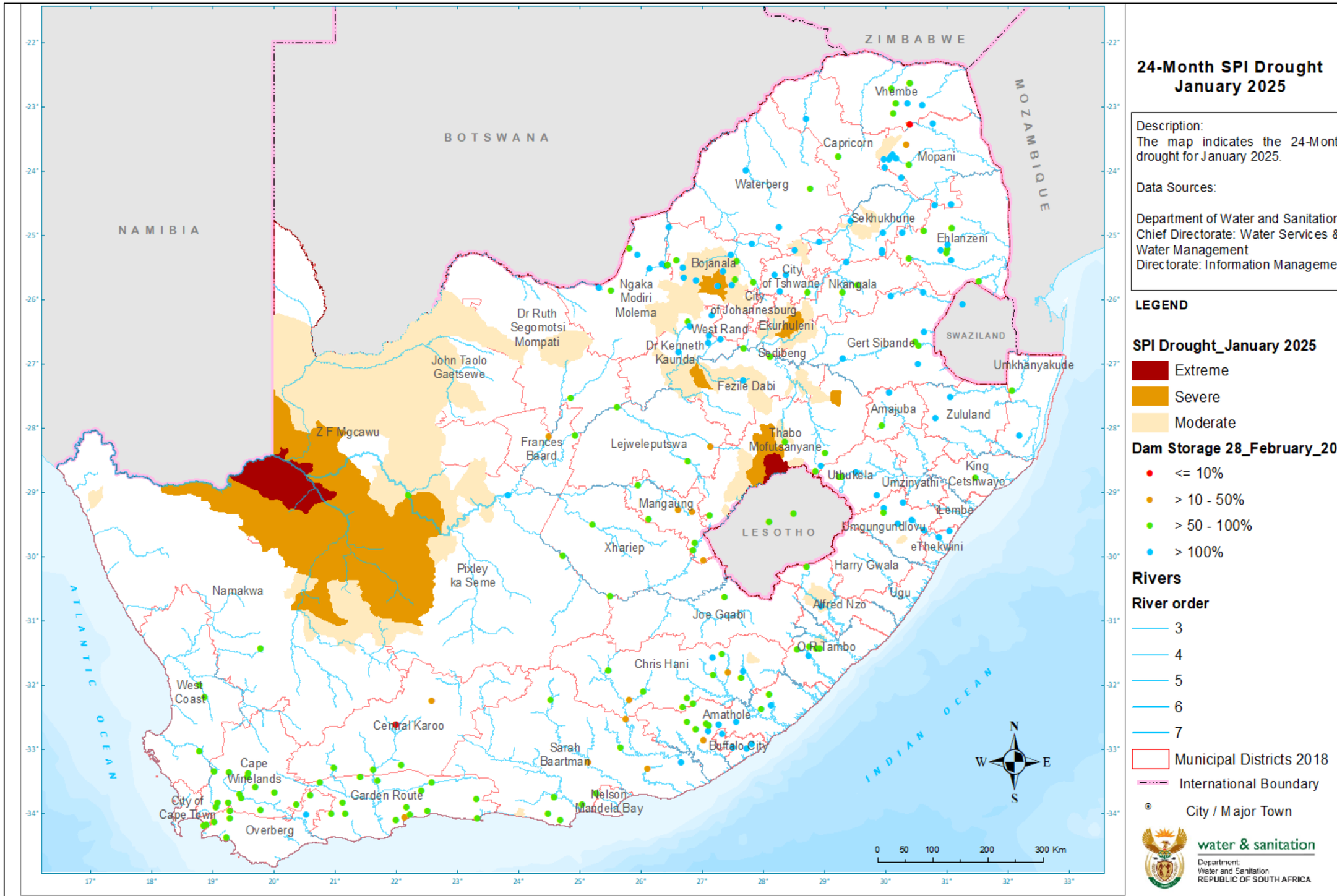
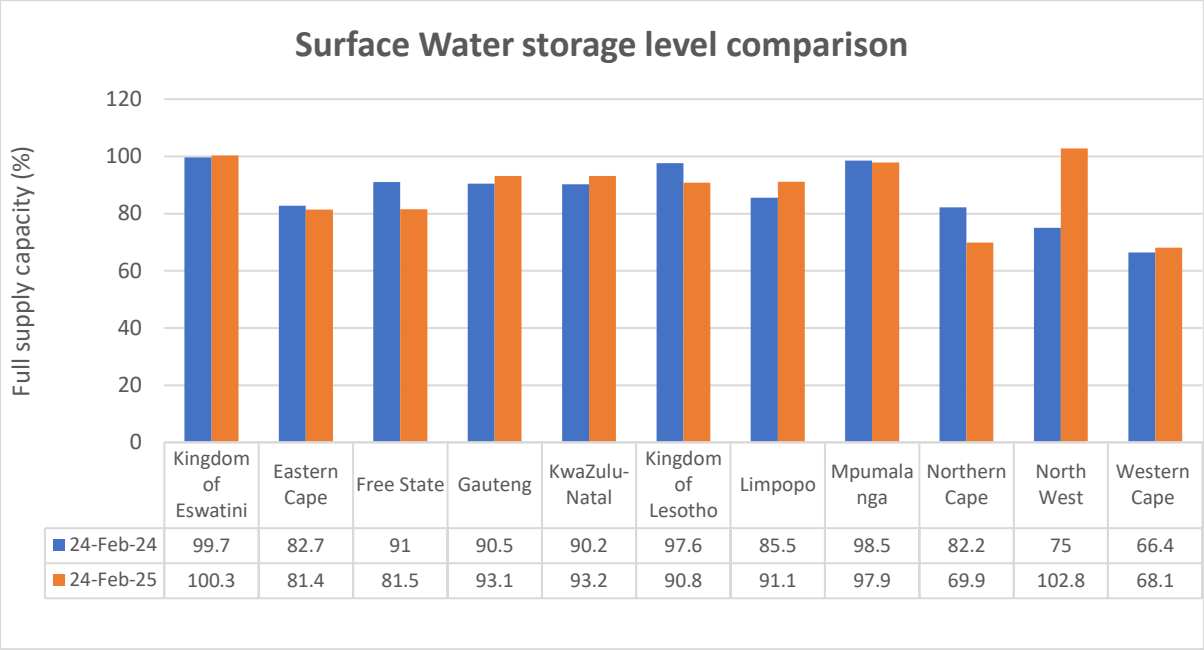


Figure 3: 24-Month Standardised Precipitation Index (SPI) and dam levels-January 2025

The comparison of the storage levels per province and international areas for February 2025 to the same time last year is presented in Figure 4. Limpopo and North West are showing a notable increase in storage levels at 5.6% and 27% respectively, indicating normal to above-normal rainfall received in February 2025. The most notable declines were observed in Northern Cape (-12.3%), Free State (-9.5%) and Eastern Cape (-1.3%). The Kingdom of Lesotho has also shown a significant decline of -6.8% in dam storage compared to the previous year.



	Kingdom of Eswatini	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Kingdom of Lesotho	Limpopo	Mpumalanga	Northern Cape	North West	Western Cape
24-Feb-24	99.7	82.7	91	90.5	90.2	97.6	85.5	98.5	82.2	75	66.4
24-Feb-25	100.3	81.4	81.5	93.1	93.2	90.8	91.1	97.9	69.9	102.8	68.1

Figure 4: Water Storage Levels February 2024 vs. February 2025

District Municipalities

The year-on-year comparison of water storage levels per district municipality is presented in Figure 5. Only the Ngaka Modiri Molema DM experienced a major increase (>60%) in dam storage levels compared to last year. Seven other district municipalities indicated a significant increase (>10%) in dam storage, over the last year three district municipalities experienced significant declines (>-10%) in dam levels, namely, Xhariep DM, Francis Baard DM, and Mangaung DM. Based on the 24-month SPI, some of these district municipalities have been experiencing drought.

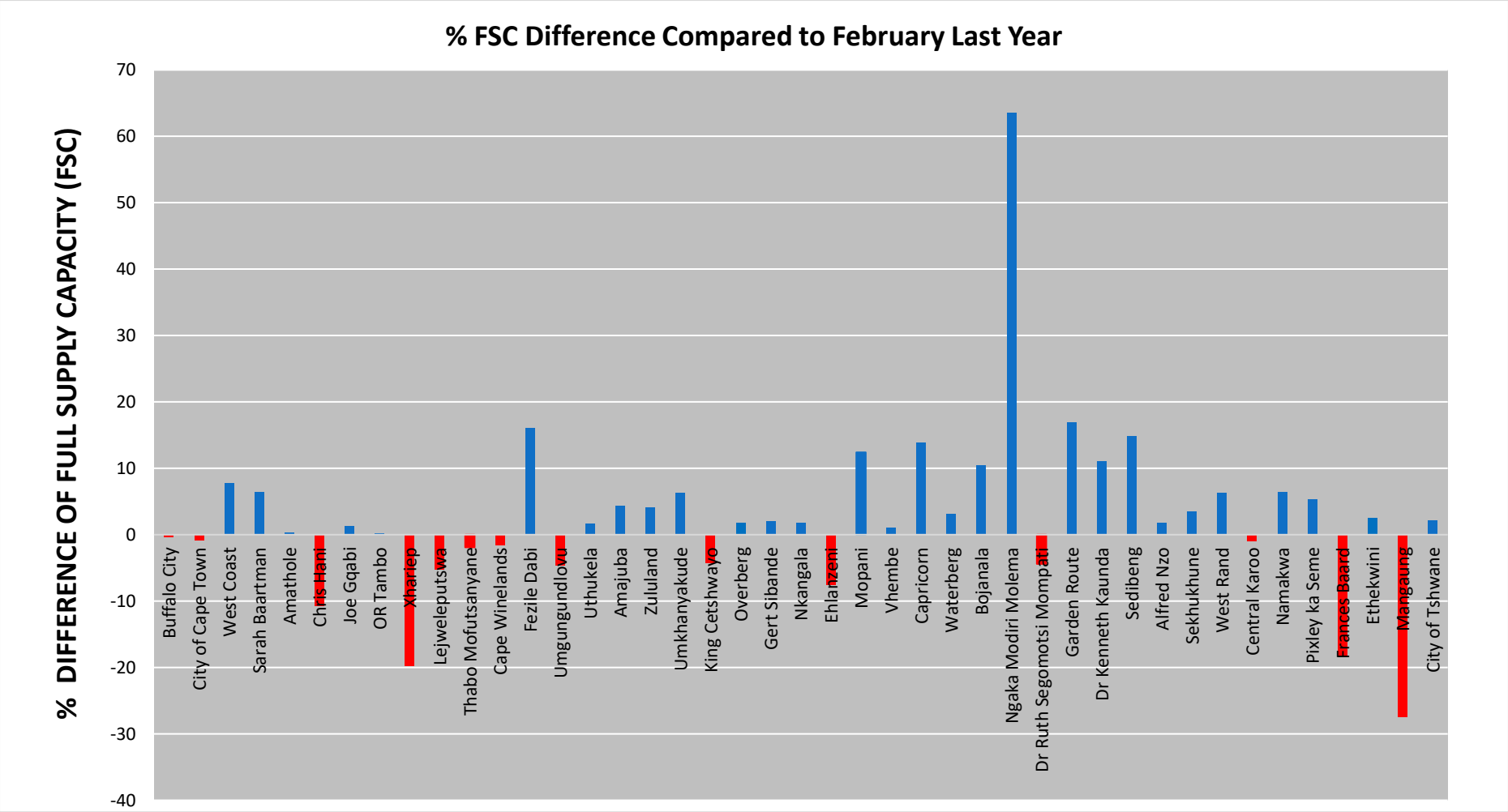


Figure 5: Comparison of water storage levels per District Municipality February 2024 vs February 2025

The water supply systems and their respective restrictions are given in Table 3. The Algoa WSS decision date was changed from 1 June to 1 November 2023, and a new annual operating analysis (AOA) for the decision date was performed, resulting in an update of water restrictions which were in effect from 1 November 2023 to 31 October 2024. However, these restrictions are yet to be gazetted. Due to infrastructure limitations, permanent restrictions are applicable for the Polokwane and Bloemfontein WSSs. The Water Supply Systems dam storage levels are presented in Table 4.

Table 3: Water Supply Systems with Restrictions

Water Supply Systems	Restrictions
Algoa WSS	The decision date was changed from 1 June to 1 November 2023, These water restrictions were imposed as of 1 November 2023, **Kouga Sub-system** Urban (Domestic and Industrial) = 5%, Irrigation = 15% **Kromme Sub-system** Urban (Domestic and Industrial) = 40%, Irrigation = 50% Gazetted on 26 April 2024 (Notice No. 50569)
Bloemfontein WSS	Domestic and Industrial = 15% When the system drops below 95%, notice is yet to be gazetted
Polokwane WSS	Domestic and Industrial = 20%

Table 4: Water Supply Systems storage levels February comparisons

Water Supply Systems/clusters	Capacity in 10^6m^3	24 Feb. 2024 (% FSC)	17 Feb. 2025 (% FSC)	24 Feb. 2025 (% FSC)	System Description
Algoa System	282	73.7	76	75.2	5 dams serve the Nelson Mandela Bay Metro, Sarah Baartman (SB) DM, Kouga LM and Gamtoos Irrigation: 1. Kromrivier Dam 2. Impofu Dam 3. Kouga Dam 4. Loerie Dam 5. Groendal Dam
Amathole System	241	99.2	99.3	99.3	6 dams serve Bisho & Buffalo City, East London: 1. Laing Dam 2. Rooikrans Dam 3. Bridle Drift Dam 4. Nahoon Dam 5. Gubu Dam 6. Wriggleswade Dam
Klipplaat System	57	96.4	83.6	86.9	3 dams serve Queenstown (Chris Hani DM, Enoch Ngijima LM): 1. Boesmanskrantz Dam 2. Waterdown Dam 3. Oxkraal Dam
Butterworth System	14	99	100	100	Xilinxa Dam and Gcuwa weirs serve Butterworth
Integrated Vaal River System	10 546	90	84.6	92.5	14 dams serve Gauteng, Sasol, and ESKOM: 1. Vaal Dam 2. Grootdraai Dam 3. Sterkfontein Dam 4. Bloemhof Dam 5. Katse Dam 6. Mohale Dam 7. Woodstock Dam 8. Zaaihoek Dam 9. Jericho Dam 10. Westoe Dam 11. Morgenstond Dam 12. Heyshope Dam 13. Nooitgedacht Dam 14. Vygeboom Dam
Luvuvhu	225	100.6	100.5	103.1	3 dams serve Thohoyandou etc: 1. Albasini Dam 2. Vondo Dam 3. Nandoni Dam
Bloemfontein	219	95.5	69.7	70	4 dams serve Bloemfontein, Botshabelo and Thaba Nchu: 1. Rustfontein Dam 2. Groothoek Dam 3. Welbedacht Dam 4. Knellpoort Dam

Water Supply Systems/clusters	Capacity in 10^6m^3	24 Feb. 2024 (% FSC)	17 Feb. 2025 (% FSC)	24 Feb. 2025 (% FSC)	System Description
Polokwane	254.27	100.1	102.9	107.6	2 dams serve Polokwane 1. Flag Boshielo Dam 2. Ebenezer Dam
Crocodile West	444	93.1	90.5	100.1	7 dams serve Tshwane up to Rustenburg: 1. Hartbeespoort Dam 2. Rietvlei Dam 3. Bospoort Dam 4. Roodeplaat Dam 5. Klipvoor Dam 6. Vaalkop Dam 7. Roodekopjes Dam
uMgeni System	923	100.7	95	97.1	5 dams serve Ethekwini, iLembe & Msunduzi: 1. Midmar Dam 2. Nagle Dam 3. Albert Falls Dam 4. Inanda Dam 5. Spring Grove Dam
Cape Town System	889	73.3	75.2	73.4	6 dams serve the City of Cape Town: 1. Voelvlei Dam 2. Wemmershoek Dam 3. Berg River Dam 4. Steenbras-Lower Dam 5. Steenbras-Upper Dam 6. Theewaterskloof Dam
Crocodile East	159	100.9	90.2	95.7	Kwena Dam supplies Nelspruit, Kanyamazane, Matsulu, Malelane and Komatipoort areas & Surroundings
Orange	7 996	95.7	75.1	76.3	2 dams service parts of the Free State, Northern and Eastern Cape Provinces: 1. Gariep Dam 2. Vanderkloof Dam
uMhlathuze	301	99.5	95.7	95.2	Goedertrouw Dam supplies Richards Bay, Empangeni Towns, small towns, surrounding rural areas, industries and irrigators, supported by lakes and transfer from Thukela River

Extreme Weather Events – February 2025

Floods are the most commonly documented disasters in southern Africa, and South Africa is no exception, having experienced 77 significant floods between 1980 and 2010 (Le Roux *et al*. 2019). The province of KwaZulu-Natal has endured catastrophic natural disasters, notably floods, leading to considerable fatalities, property destruction, and infrastructure disruption, with the 2022 floods ranking among the deadliest in the province's history. In February 2025, the province encountered additional flooding and mudslide incidents.

On the 19th of February, the South African Weather Service (SAWS) issued an Orange Level 5 warning for disruptive rainfall anticipated to impact the northern regions, coastal areas, and adjacent interior of KwaZulu-Natal (Figure 6). The weather service forecasted rainfall accumulation of up to 100 mm, attributed to a tropical moisture influx and an upper air system. An associate professor from the University of Pretoria, Liesl Dyson, interviewed by eNews Channel Africa (eNCA), indicated that a surface high-pressure system was supplying moist air to the province. The distinctive topography of the KwaZulu-Natal escarpments compels the onshore flow to ascend, leading to increased precipitation. She additionally noted that two tropical cyclones were observed in the Indian Ocean on 19 February 2025.

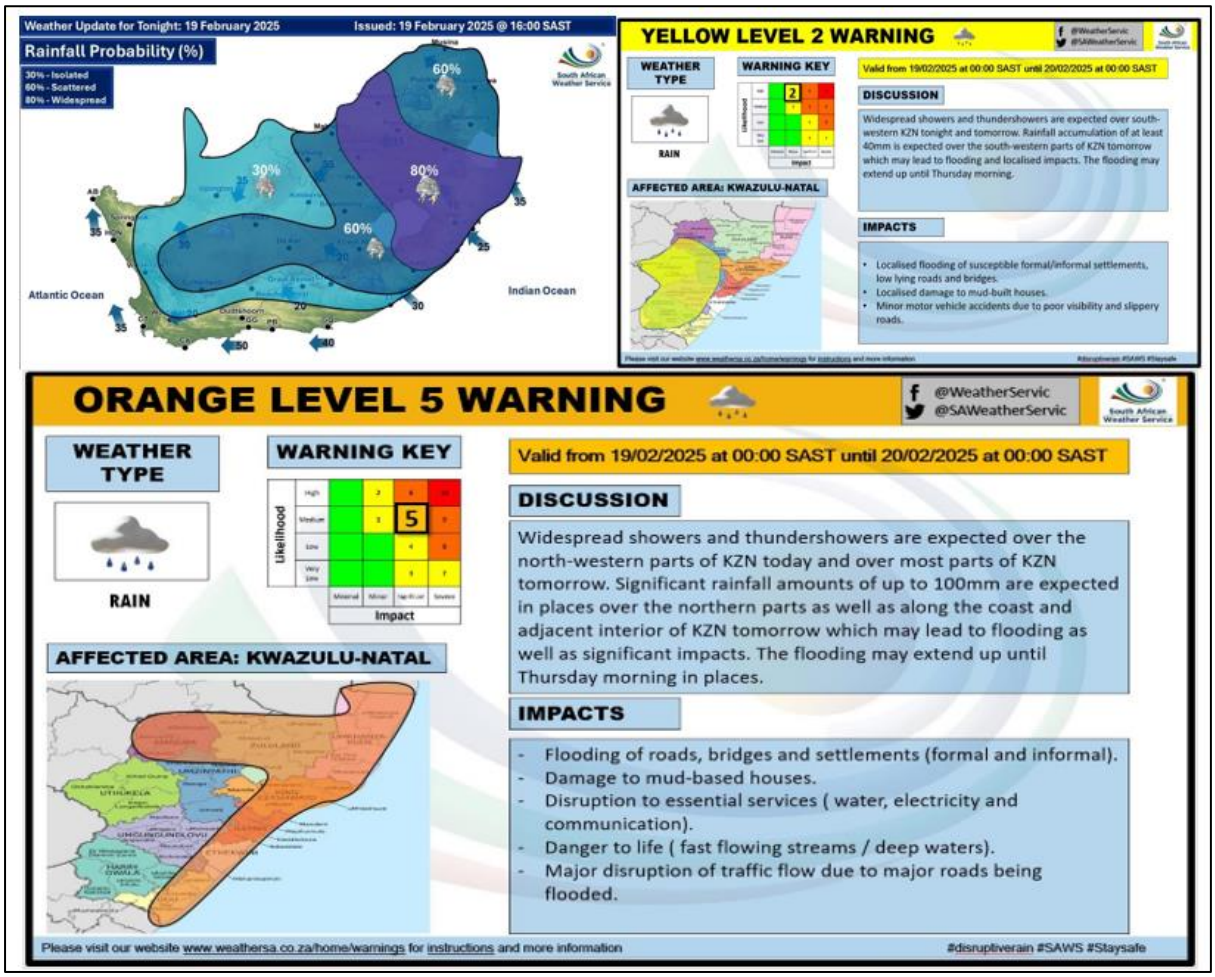


Figure 6: SAWS Severe Weather Alerts for parts of KwaZulu-Natal Before Flooding (Source: SAWS)

As anticipated, the heavy rainfall led to flooding primarily impacting areas within the eThekwini Metropolitan Municipality, including Phoenix Industrial, uMlazi Engonyameni, Southridge, Folweni, Isipingo, Bayview, Warner Beach, Ohlange, and Umzinyathi, (eThekwini Metropolitan Municipality, 2025). The Forecast Early Warning System reported 184mm of rainfall in the Amanzimtoti area from midnight to the morning of the 20th of February.

The impact of the floods, as reported by eThekwini Metropolitan Municipality (2025), is as follows:

- At least 22 people died due to the floods and landslides.
- Landslides were particularly problematic in areas like KwaMakhutha and Folweni, leading to casualties and property damage.
- Infrastructure, including roads and bridges, was severely damaged, with some homes destroyed and others declared unsafe.
- Thousands of people were displaced, and many were relocated to temporary shelters. About 280 families in Lamontville were affected and relocated to temporary shelters while mop-up operations continued.
- The floods caused an estimated R3.1 billion in damages.

Some of the destruction caused by heavy rains in the eThekwini municipal area is presented in Figure 7.

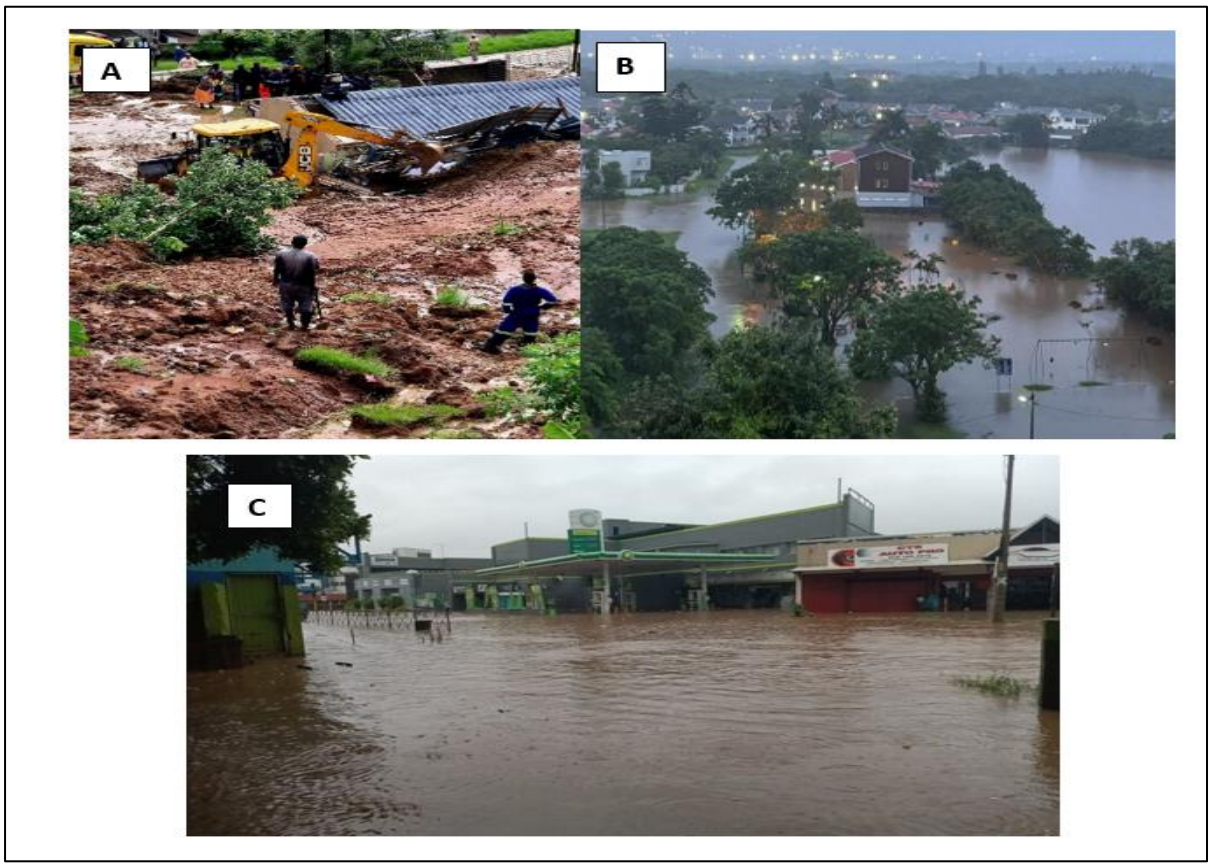


Figure 7: (a) mudslide rush into a house, trapping and killing two people in Adams Mission, in KwaMakhutha, south of Durban; (b) parts of Isipingo beach were flooded ;(c) flooded Kingsway Road near the Amanzimtoti CBD. (Source: Facebook).

Lesotho Highlands Tunnel Closure

The collaborative maintenance operation being carried out by the Trans-Caledon Tunnel Authority (TCTA) and the Lesotho Highlands Development Agency (LHDA) is in progress. It commenced after the closure of the tunnel system on 1 October 2024. This essential undertaking aims to ensure the long-term functionality and safety of the tunnel infrastructure, which plays a vital role in the region's water supply. The TCTA is specifically managing the maintenance work on the Delivery Tunnel North, located in South Africa, while the LHDA is focused on the transfer tunnels connected to the Muela hydropower station in Lesotho.

According to the Department of Water and Sanitation (DWS, 2024), the previous maintenance shutdown in 2019 revealed alarming issues, such as extensive wear and tear on the steel liners of the tunnels, necessitating urgent repairs on both the South African and the Lesotho sides. The scope of the current work is comprehensive, it includes grit-blasting the steel-lined sections around the entire circumference of the tunnels, which aims to remove corrosion and prepare the surfaces for reapplication of protective coatings. This crucial step, along with various other maintenance and repair activities identified during the 2019 shutdown, is planned to take ample time.

The goal is to reinforce the infrastructure to withstand the test of time and ensure reliable operation for the next 20 to 30 years. However, this extensive shutdown comes with considerable implications for water supply among users along the Liebenbergsvlei River and its many tributaries. The Liebenbergsvlei River, which is fed directly by outflows from the tunnel, is crucial for the towns of Bethlehem, Reitz, and Tweeling, as well as for local licensed irrigators. To mitigate challenges in water supply, preparations are to fill the Saulspoort Dam at the onset of the shutdown. DWS analysis shows that a fully stocked Saulspoort Dam will be capable of meeting local water demands—including those of Bethlehem, Reitz, and Tweeling—for an impressive duration of up to nine months, which comfortably exceeds the expected six-month closure of the tunnel.

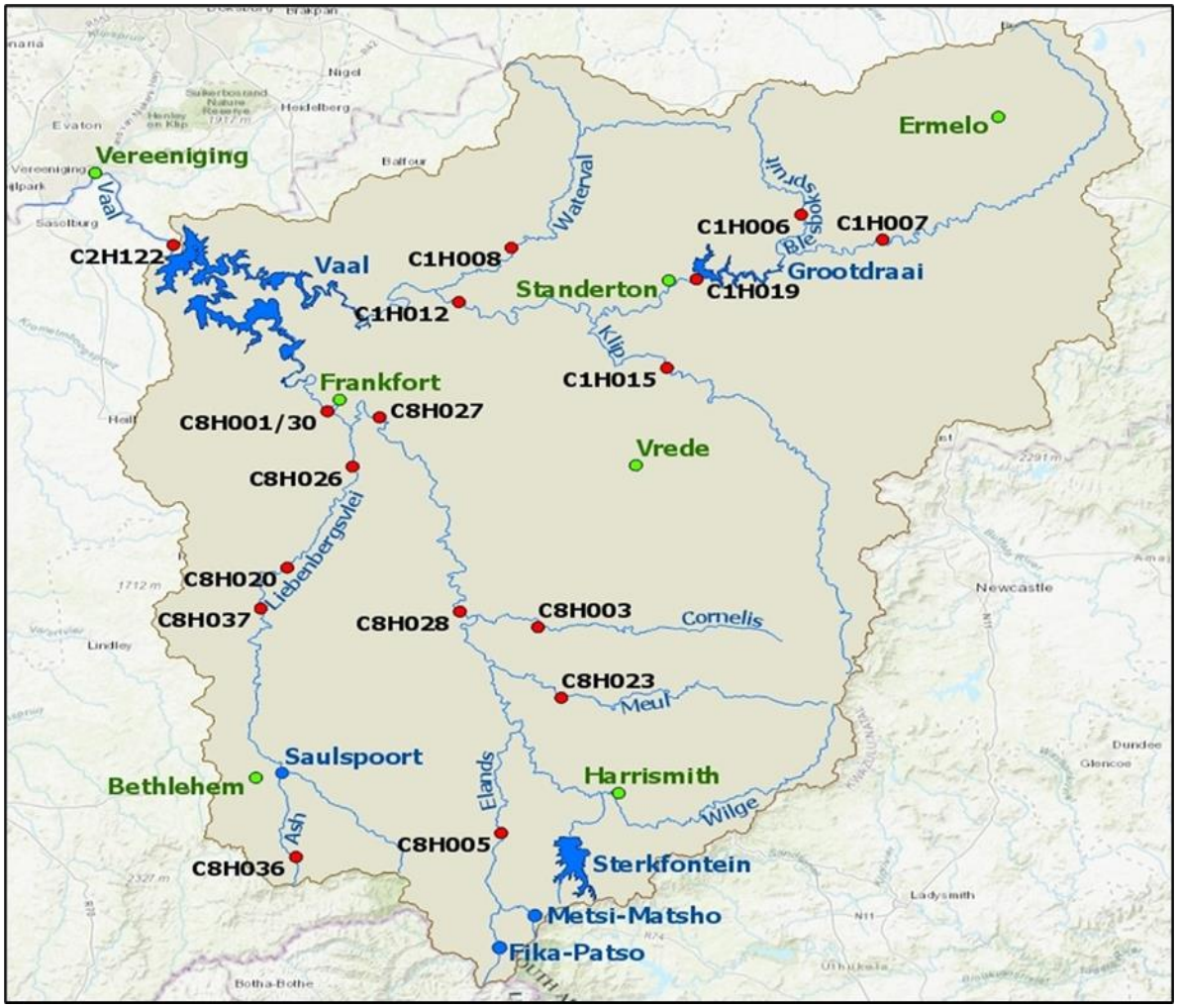


Figure 8: Upper Vaal Flow Monitoring sites (Green Dot – Towns, Blue Dot – Standalone Dams, Red Dot – Flow monitoring Point). Source https://www.dws.gov.za/hydrology/Unverified/Home/OrangeVaal

FLOWS

The current flow conditions of the Ash River Outlet are presented in Figure 9. The ash river at station C8H036 is still closed.

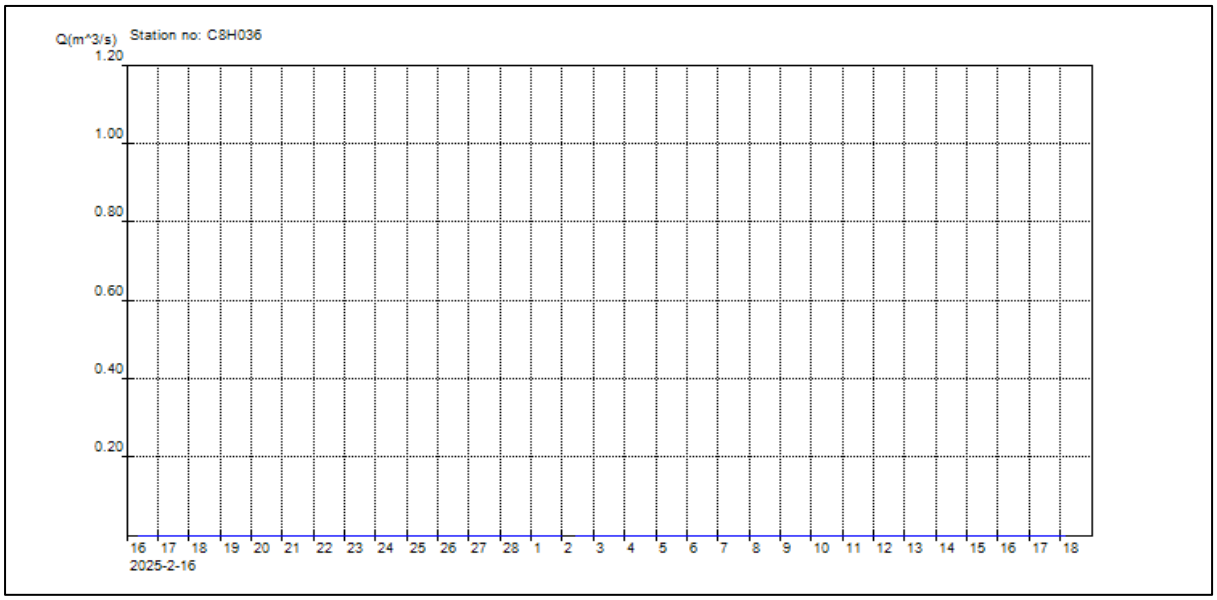


Figure 9:Ash at Outlet from Katse Dam. Source: https://www.dws.gov.za/Hydrology/Unverified/FlowDetail/6671

As of 28 February 2025, the Saulspoort dam is at an impressive 82.9% of FSC, compared to when it was at 74.5% of FSC on 18 February 2025, reflecting the significant impact of recent rainfall, as shown in Figure 10

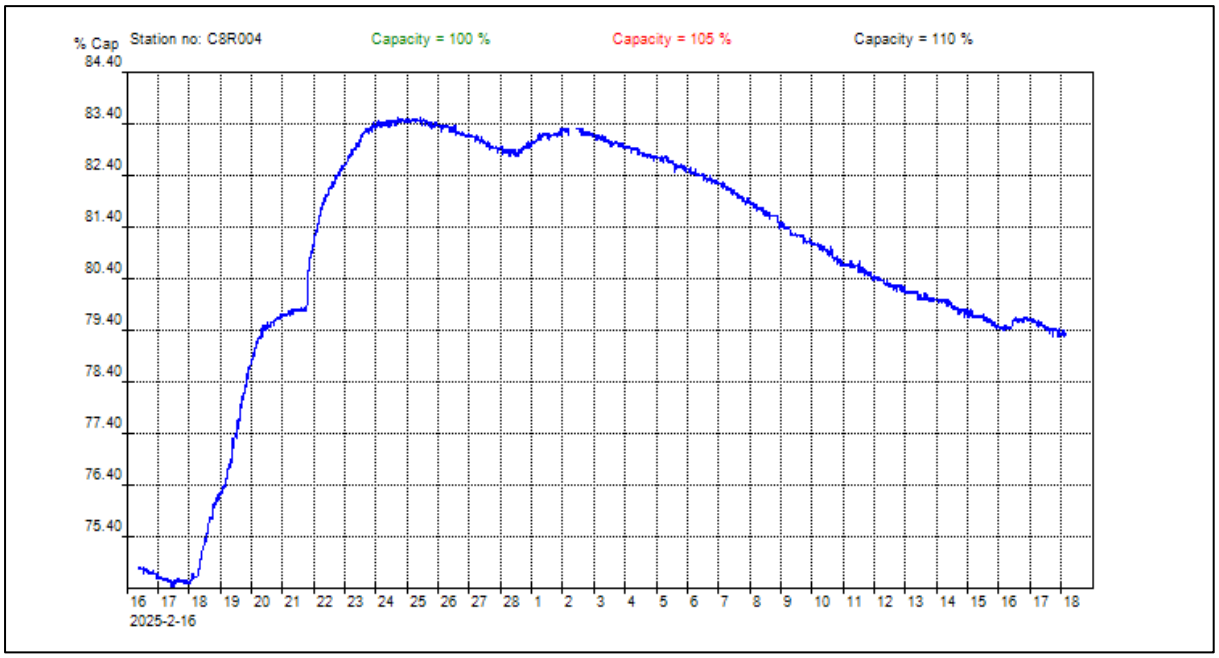


Figure 10: Liebenbergsvlei at Saulspoort Dam Source: https://www.dws.gov.za/Hydrology/Unverified/FlowDetail/1122

The graph as shown in Figure 11 depicts the predicted planned water release from the Saulspoort Dam The orange line represents the predicted volume and the blue line depicts the actual water volume in the dam. Due to rainfall during the closure period, the situation is much better than anticipated. The graph indicates that as of 11 February 2024, there is an excess of 3.9 million cubic meters of water. Sufficient water is available in Saulspoort to continue releases until the tunnel is reopened.

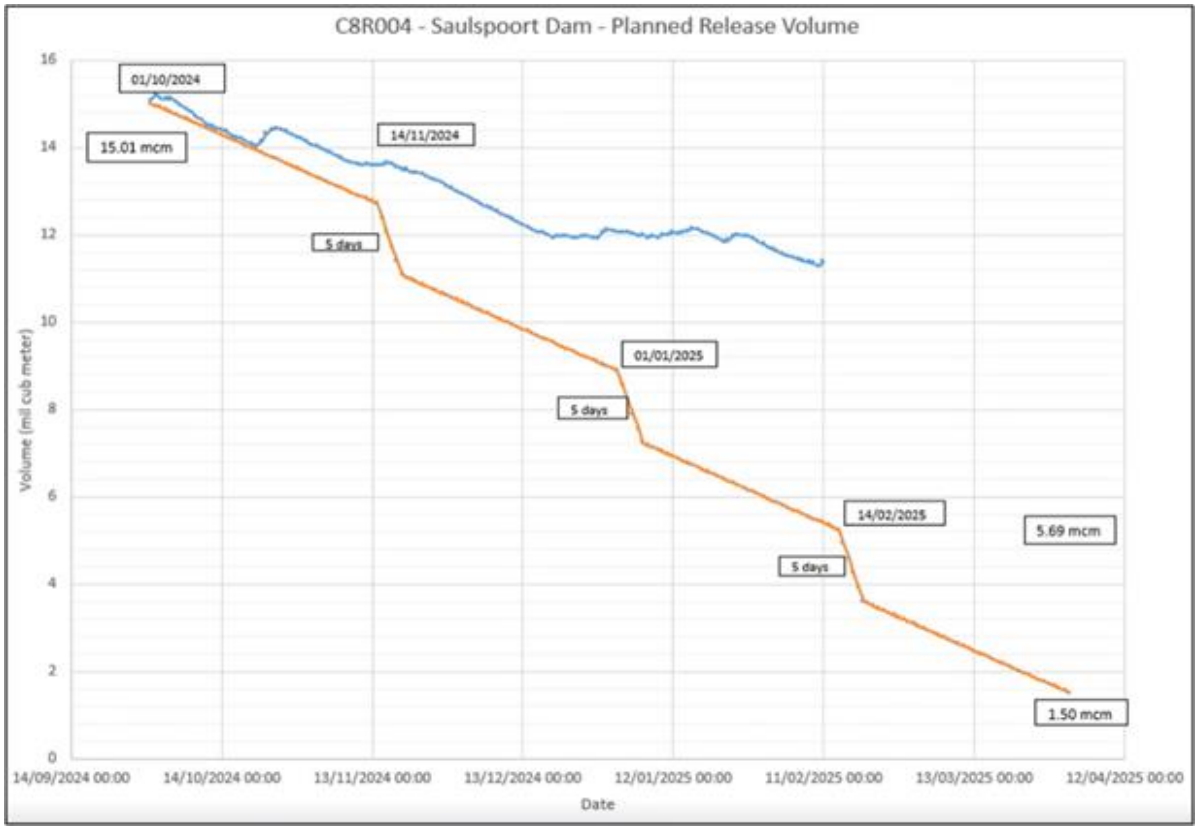


Figure 11: Saulspoort Dam Planned Release Volume projections

Figure 12 below shows that there has been a slight increase in flow levels at Liebenbergsvlei C8H037. A notable flow rate of 2.5 m^3/s was observed on February 18, 2024. This indicates that, despite fluctuations, the river continues to maintain its flow

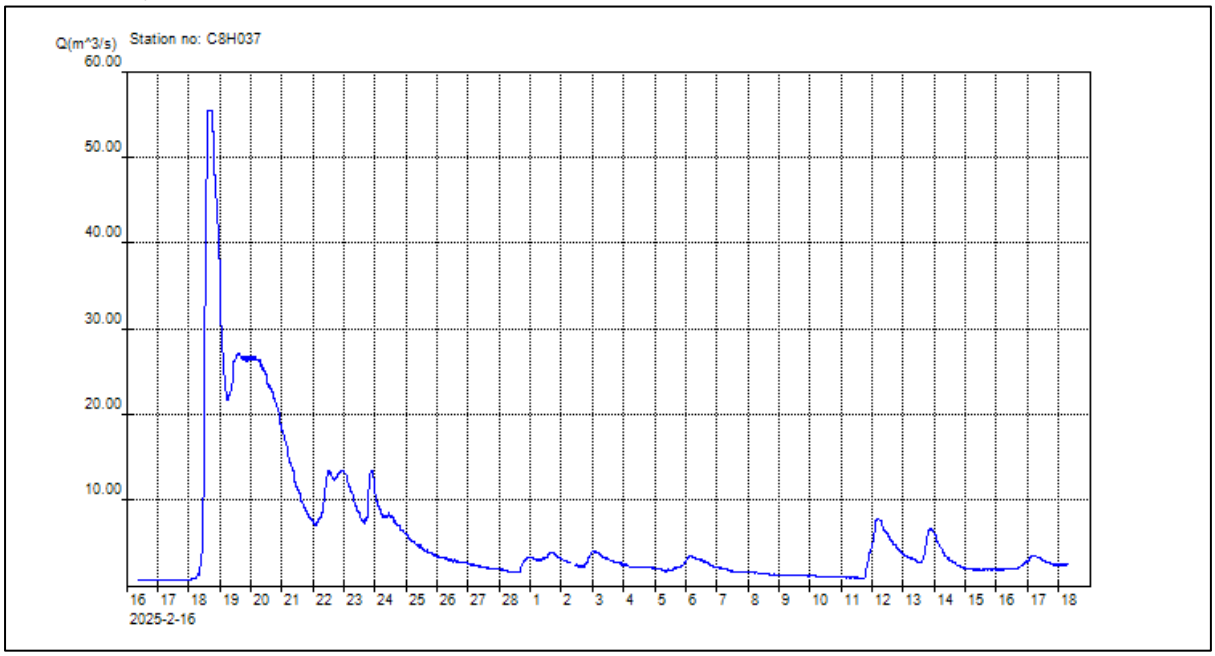


Figure 12: Liebenbergsvlei at Reward. Source https://www.dws.gov.za/Hydrology/Unverified/FlowDetail/6703

A comprehensive analysis of the data from gauging station C8H027, as depicted In **Error! Reference source not found.** , shows the water levels of the Wilge River over a short period. The Wilge River has showcased steady water flow throughout February, exhibiting an average flow rate of approximately 88.3 m^3/s. This gauging station plays a role in capturing the river's dynamics as it progresses toward the Vaal Dam.

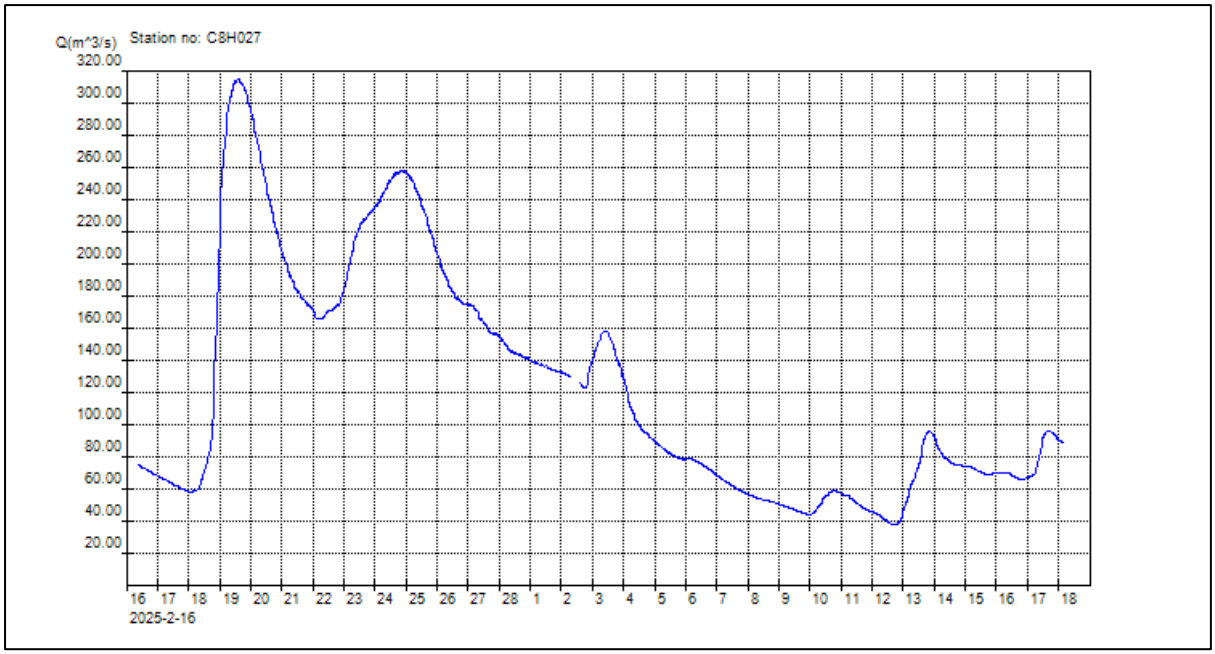


Figure 13: Wilge at Ballingtomp. Source https://www.dws.gov.za/Hydrology/Unverified/FlowDetail/2252

As of 28 February 2025, the Vaal Dam is at 90.3% of FSC refer to Figure 14. Heavy rains have raised the dam's storage level significantly with plans to fill the dam with water from Sterkfontein dam during the LHWP tunnel closure no longer necessary. The rise in the dam levels has also boosted the overall Integrated Vaal River System which is at 95% of FSC.

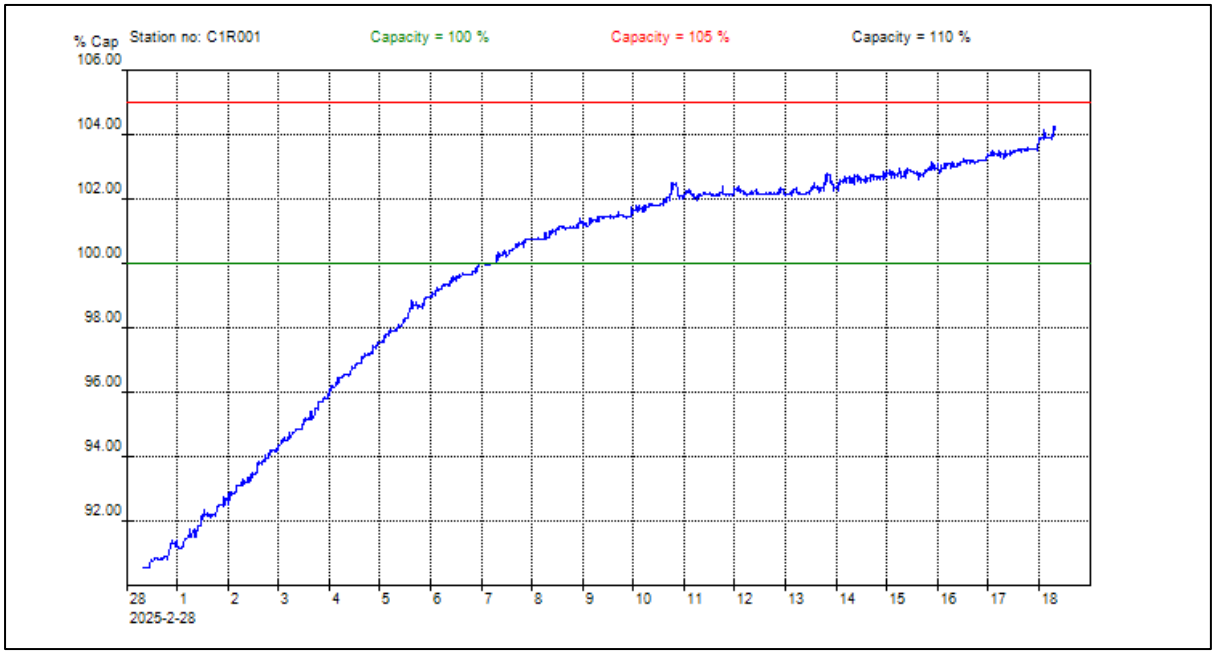


Figure 14: Vaal dam Source https://www.dws.gov.za/Hydrology/Unverified/FlowDetail/1695

Recently, rainfall has significantly improved the dam's capacity, with the Saulspoort Dam currently at 82.9% of its full supply capacity. This suggests that the region has received considerable precipitation, positively affecting water storage levels. The Saulspoort dam ensures a sustainable water supply for

the local municipalities of Dihlabeng, Nkeotana, and Mafube, which are situated along the Liebenbergsvlei River. The projected planned releases for Saulspoort Dam indicate there is an excess of 3.9 million cubic meters of water therefore there is sufficient water available in Saulspoort for releases until the tunnel is reopened. Over the past few months, as the LHWP continues to be under maintenance and shut down, the water levels of the Vaal Dam have been declining, and preparations were underway to augment the water from Sterkfontein Dam as soon as the Vaal Dam level reached 18%. The Vaal Dam storage levels drastically improved, and the Vaal Dam is at 90.3% of FSC. The increase in storage levels is attributed to the prolonged heavy rainfalls experienced In February There is therefore no need for water release from Sterkfontein Dam to the Vaal Dam

TCTA Update: Progress on the South African Side and Lesotho Side

The maintenance and refurbishment of the Lesotho Highlands Water Tunnel have been ongoing since its closure on 31 October 2024. After the fifth (5^{th}) month of the shutdown, all repairs have resumed. Currently, the tunnel and concrete sections are 70% complete. Outstanding repairs in these areas will impact the painting schedule, so they will be addressed after the painting is finished. For the steel line section, it was reported that 40% had been completed by 11 February 2025. The valves have been sandblasted and sent out for recoating and will be returned to the site for installation.

From the Lesotho side, it is reported that there is progress with sandblasting and coating. The schedule indicates that the final portion of the work will be completed by 29 March 2025. There are challenges experienced including higher than anticipated seepage and a change in sandblasting technique (from manual to automated approach) than proposed in the tendering – high humidity affecting the automated approach. Therefore, there will be an extension of three weeks for the tunnel closure. The contractor is reported to have procured additional equipment to better manage the seepage challenge. Once all the work is finished, water is expected to start flowing during the third week of April. Stakeholders will be informed in advance when the water will be released once the maintenance is completed.

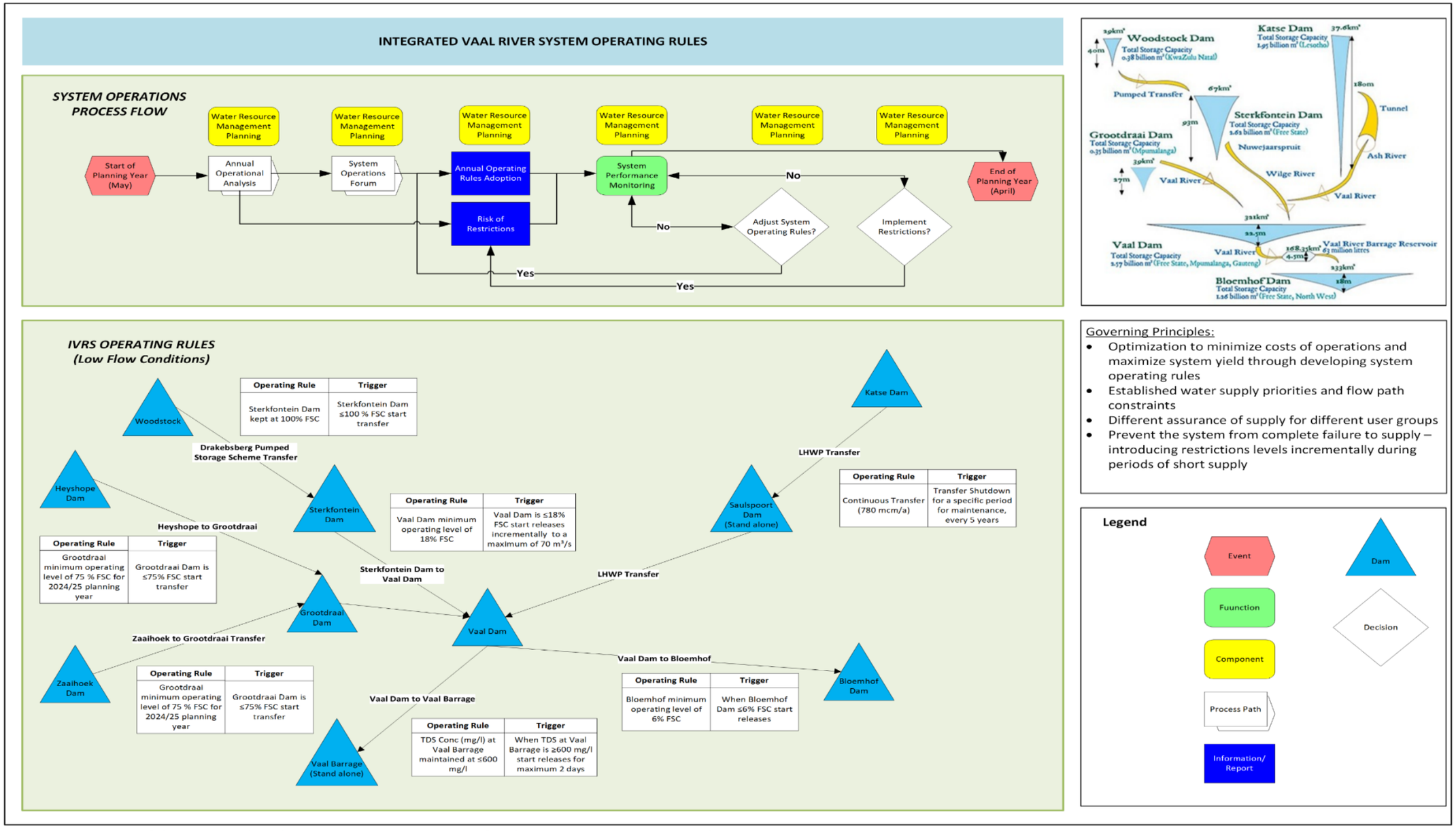


Figure 15: Summary of the Integrated Vaal River System Operating Rules for planning year May 2024 – April 2025

Compiled by:
Hulisani Mafenya, Nokulunga Biyase, Mirrander Ndhlovu, Thandekile Mbili and Joshua Rasifudi

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Accessible on the Website:
National State of Water Reporting Web page:
https://www.dws.gov.za/Projects/National%20State%20of%20Water%20Report/default.aspx

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Glossary

Term	Definition
AOA	Annual Operating Analysis
DM	District Municipalities
DWS	Department of Water and Sanitation
ENSO	El Niño-Southern Oscillation
FSC	Full Storage Capacity
HY	Hydrological Year
LHDA	Lesotho Highlands Development Agency
SAWS	South African Weather Service
TCTA	Trans-Caledon Tunnel Authority
SPI	Standardized Precipitation Index (SPI) is a widely used index to characterise meteorological drought on a range of timescales. On short timescales, the SPI is closely related to soil moisture, while at longer timescales, the SPI can be related to groundwater and reservoir storage
WSS	Water Supply System
Water Supply System	A typical town/city water supply system consists of a gravity or pumping-based transmission and distribution system from a local or distant water source with a needed water treatment system

References

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