



INKOMATI-USUTHU

CATCHMENT MANAGEMENT AGENCY



WATER QUALITY AND QUANTITY STATUS

USUTHU CATCHMENT

TARIFF CONSULTATION MEETING

26 JULY 2023

RESOURCE MONITORING OBJECTIVES

- **IUCMA** has the following Monitoring Programme(s):
 - ❖ Water Quantity
 - ❖ Water Quality
 - ❖ River Eco-status Monitoring programme (REMP)
- IUCMA conducts regional monitoring within the Inkomati-Usuthu WMA which feeds into the national monitoring system.
- Regional resource monitoring objectives is to **measure, assess** and **report** on water resource compliance status and trends.
- Relating to **quantity, quality** and **aquatic ecosystem** in a manner that support balanced decision-making and planning for management, protection and sustainable use of water resources.

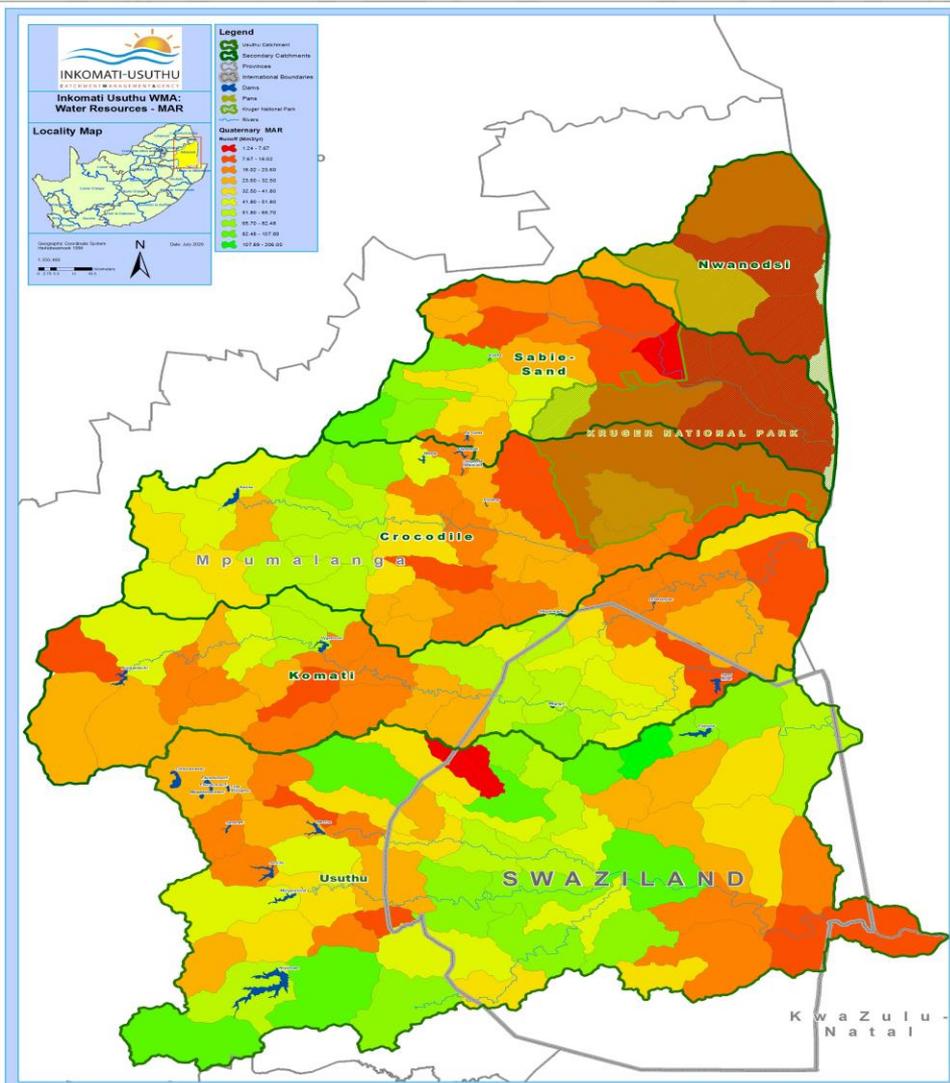
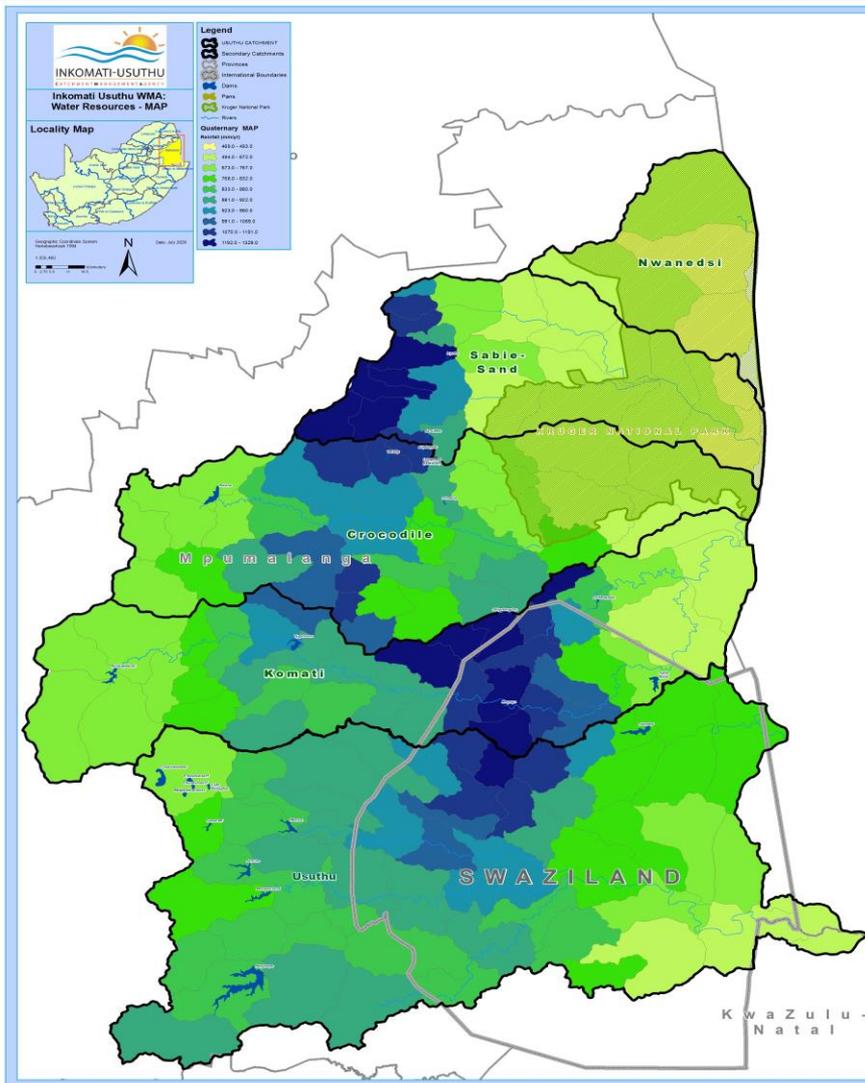


RESOURCE AVAILABILITY STATUS

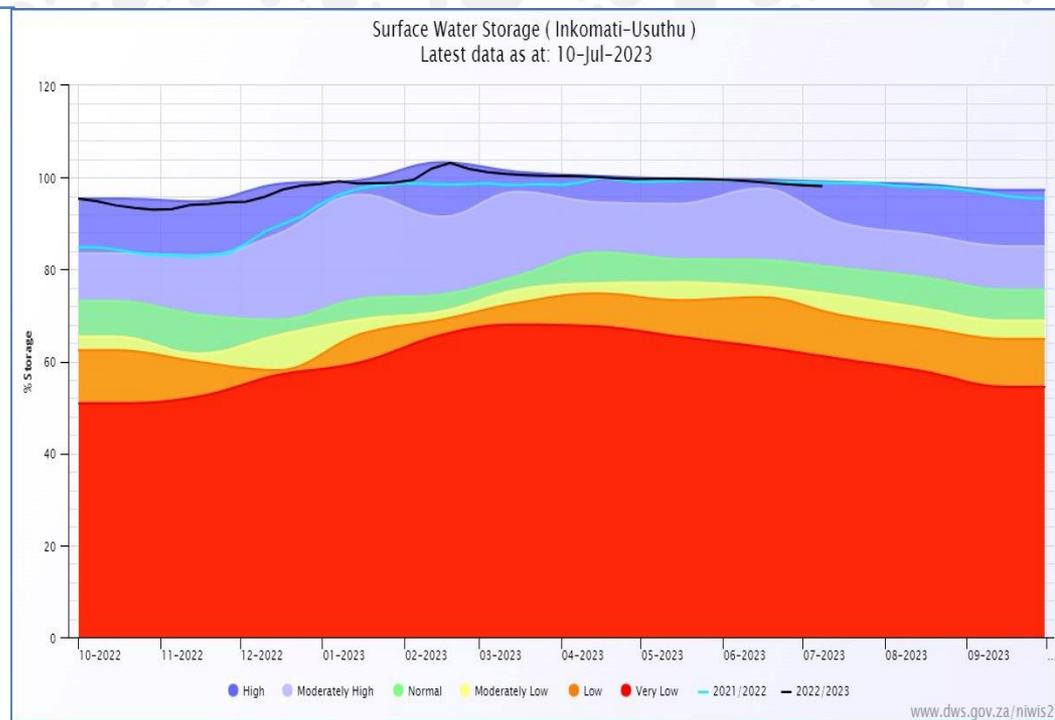
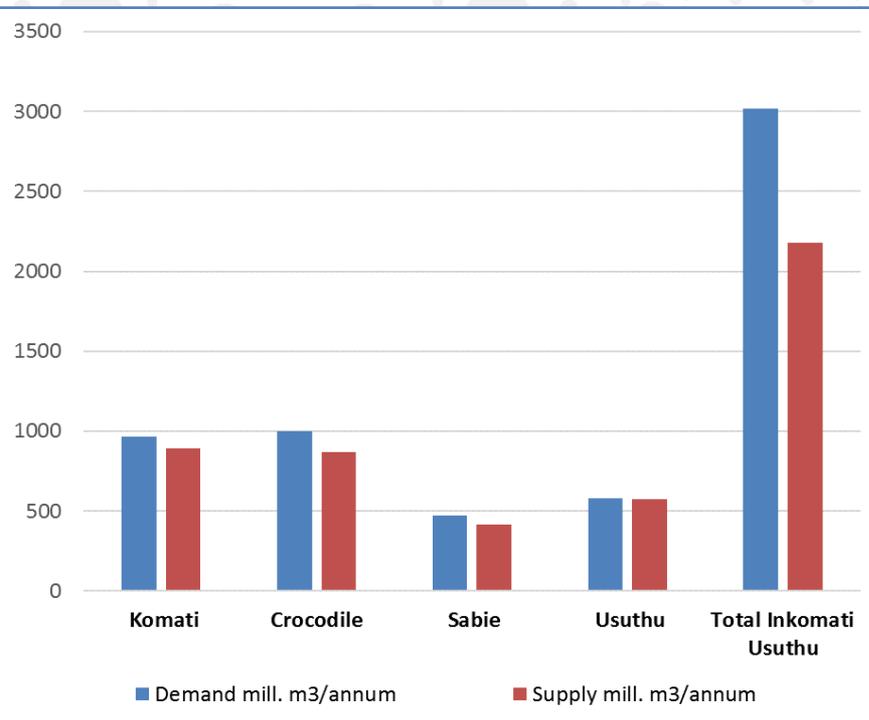
Surface and Groundwater Quantity Status



DISTRIBUTION OF MEAN ANNUAL RAINFALL AND MEAN ANNUAL RUNOFF IN THE WMA



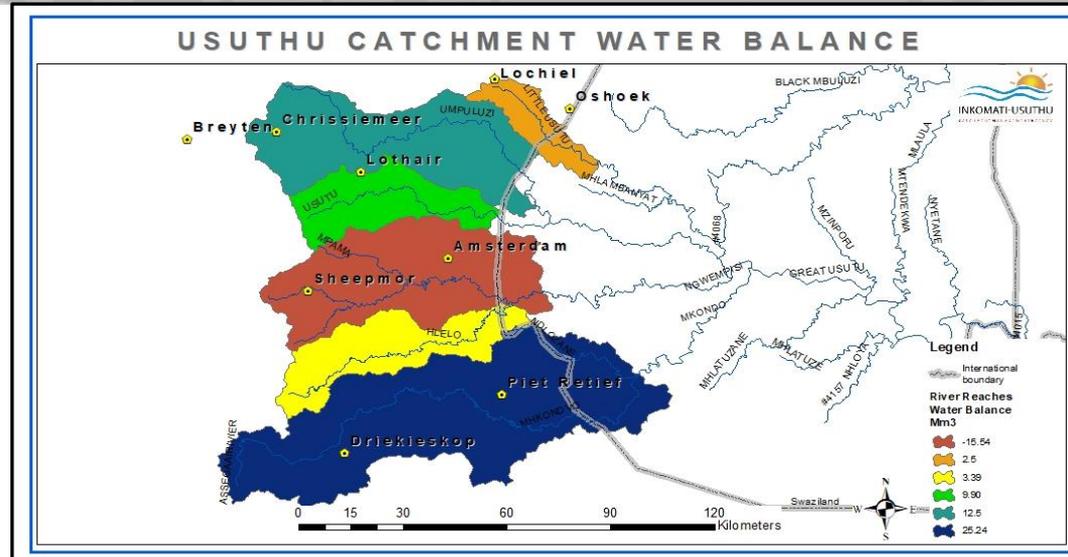
SURFACE WATER RESOURCES STATUS



All dams are above normal, an indication of excess water in the system for annual allocations to different sectors through to next rain season. Effects will be more felt by users relying directly on river flows as the river levels will be dropping until next rainy season.



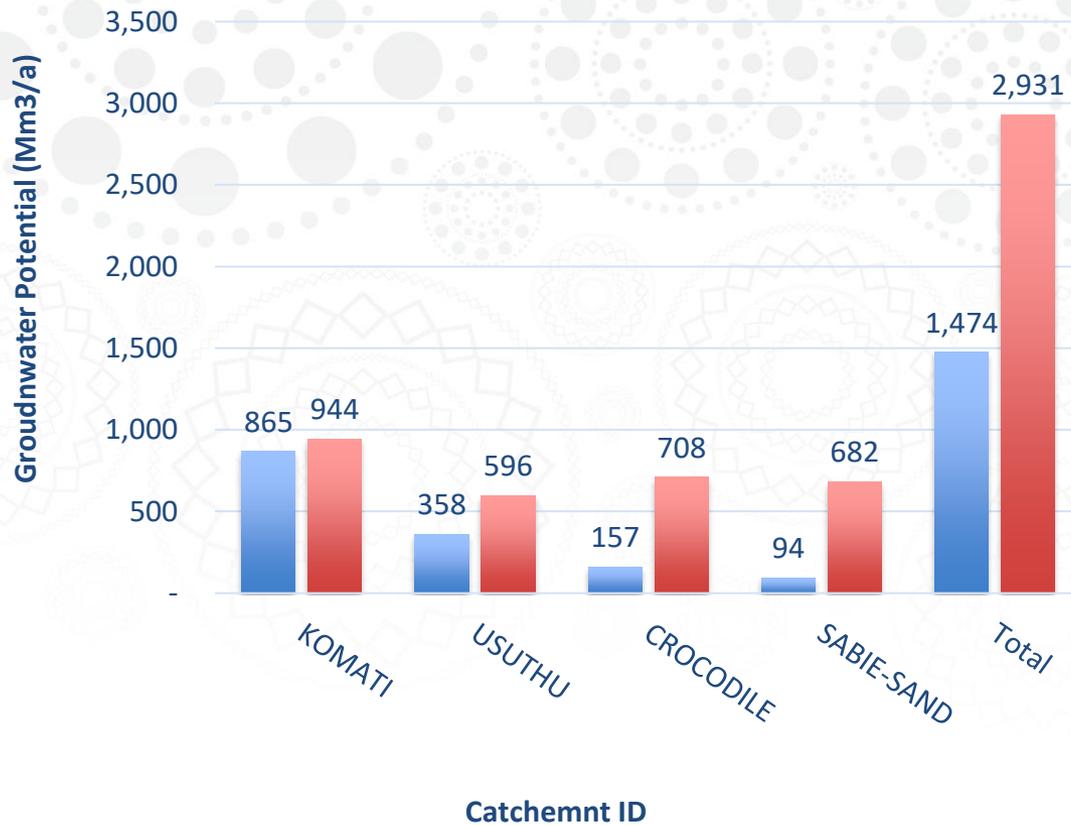
USUTHU SURFACE WATER BALANCE



River Reach/Tributary	Water available at mixed assurance	Water requirement	Balance	
			Low assurance	High assurance
Assegaai	118.3	93.1	10.0	5.0
Hlehlo	4.3	0.9	3.4	2.0
Ngwempisi	24.0	27.7	-3.7	-5.0
Usuthu	20.6	10.7	3.0	1.5
Mpuluzi and Matula	10.0	7.7	2.3	1.0
Lusushwana	3.8	1.3	2.5	1.0
Total	181.0	141.4	17.5	5.5

The Usuthu system has excess water except the Ngwempisi sub-system (Sheepmore and Amsterdam towns), where water balance is negative. The Amsterdam is currently being built to mitigate the issue of assurance of supply to Amsterdam town.

GROUNDWATER RESOURCES STATUS

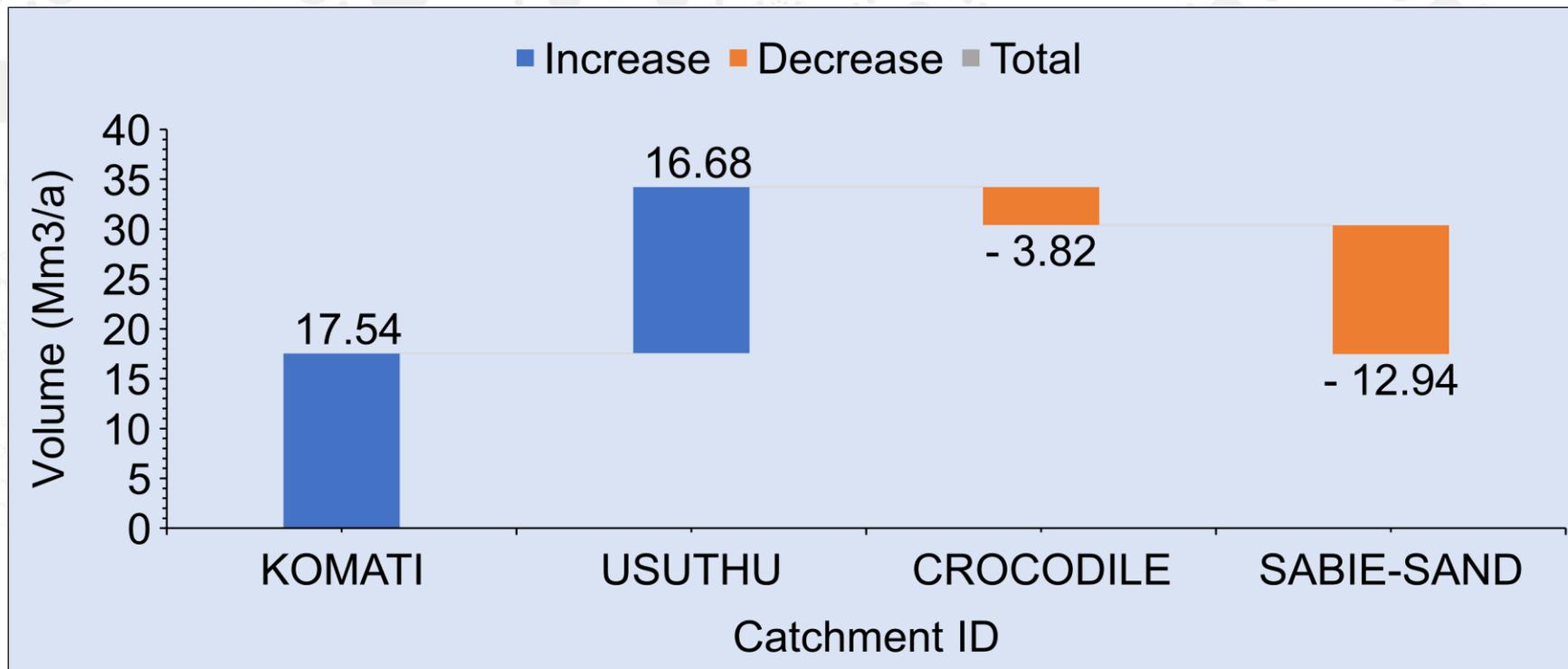


Since 2006 estimates (GRA II), groundwater potential has dropped by approximately:

40% for Usuthu

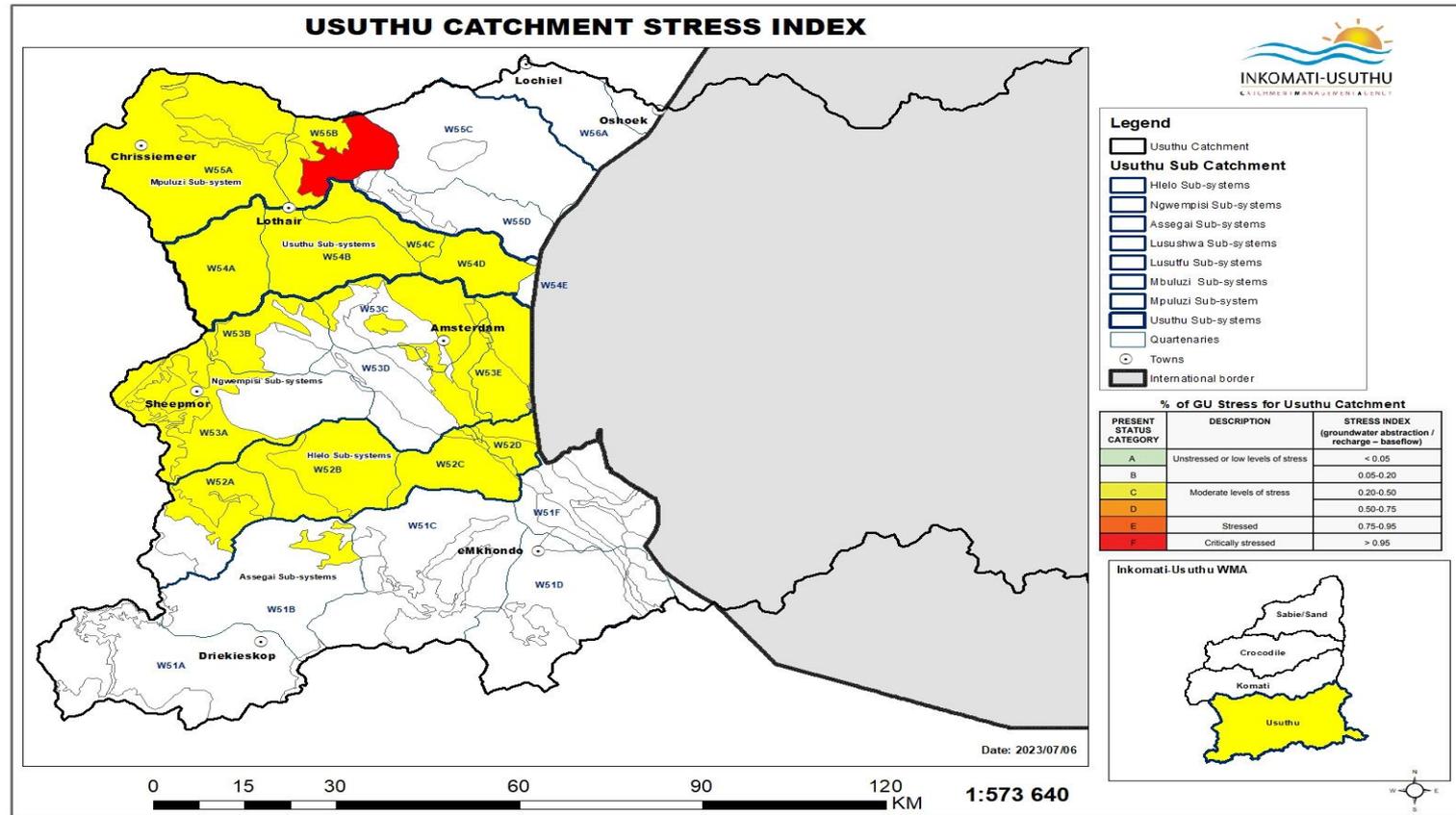
- 2022 IUCMA Resource Potential
- 2006 GRAII Resource Potential

GROUNDWATER STORAGE CHANGE



- In general, change in groundwater storage for Usuthu is positive due to minimal stress on the groundwater availability.
- The recharge exceeds the groundwater use in Usuthu Catchment thus groundwater potential is positive.

USUTHU GROUNDWATER STRESS INDEX CONDITION



In the Usuthu catchment the groundwater resources are still adequate, just as surface water resources and socio-economic developments must be promoted in these areas.

RESOURCE QUALITY STATUS

Surface Water Quality Status



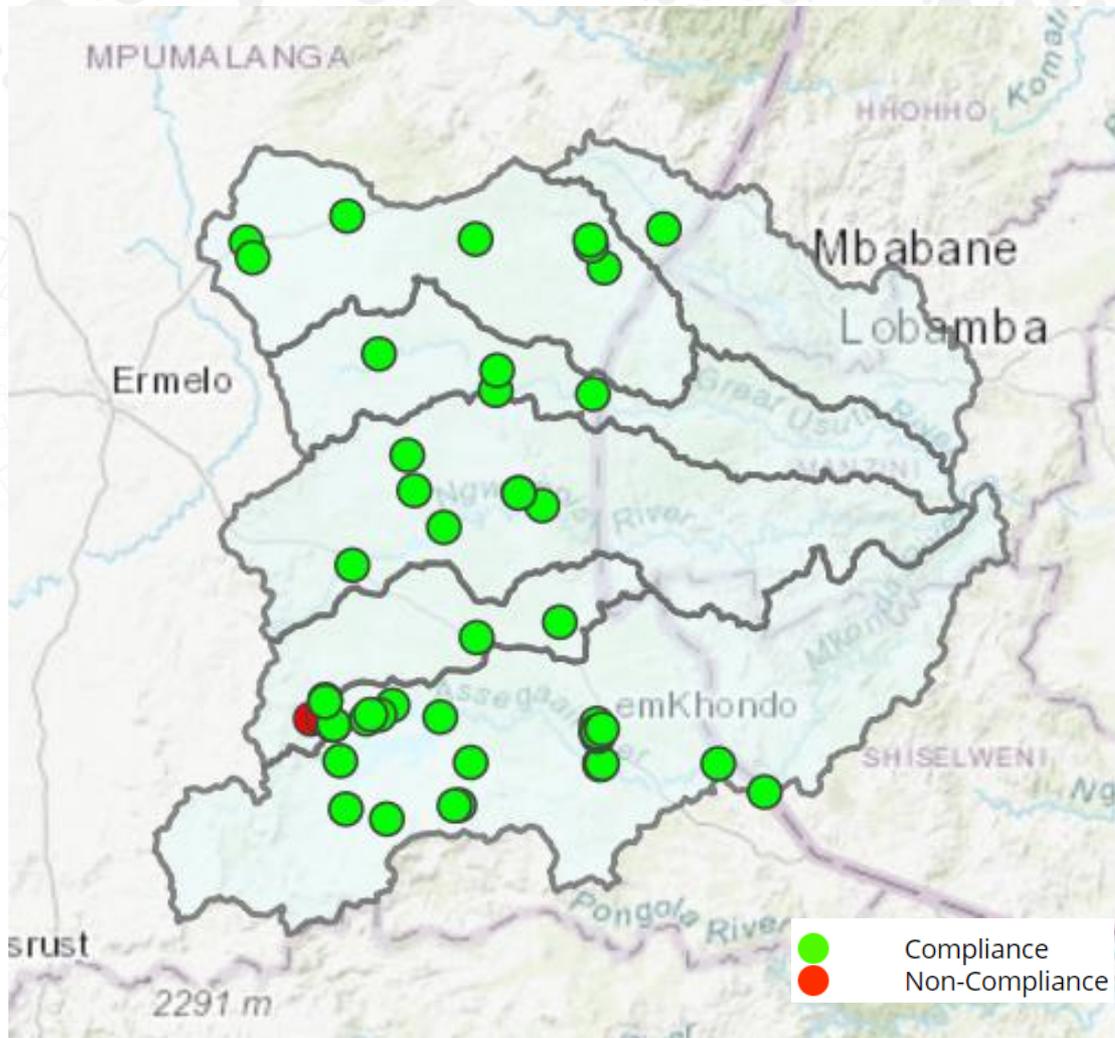
WATER QUALITY DATA REPORTED

- The data reported for Usuthu Catchment ranges between April 2022– March 2023 within the WMA.
- The compliance of indicator variables tabulated were compared with TWQG.
- The selected indicator variables are as tabulated below:

Classified Water quality variables	Indicator Variables	Statistical analysis of data
System variable	pH	Average
Salts	Electrical Conductivity	Average
Nutrients	Phosphate	Median
Microbial	E coli	Average
Eutrophication	Chlorophyll-a and Total Phosphorus	Median

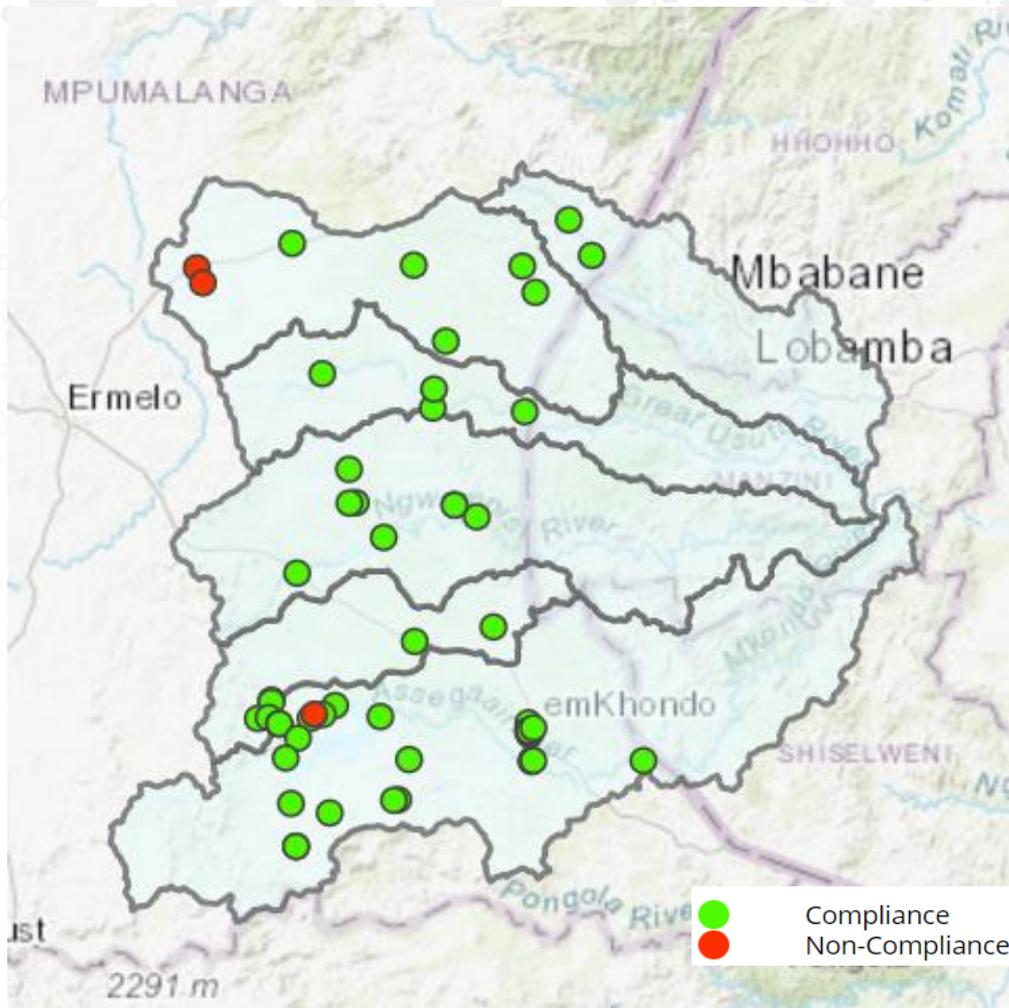


WATER QUALITY STATUS: PH



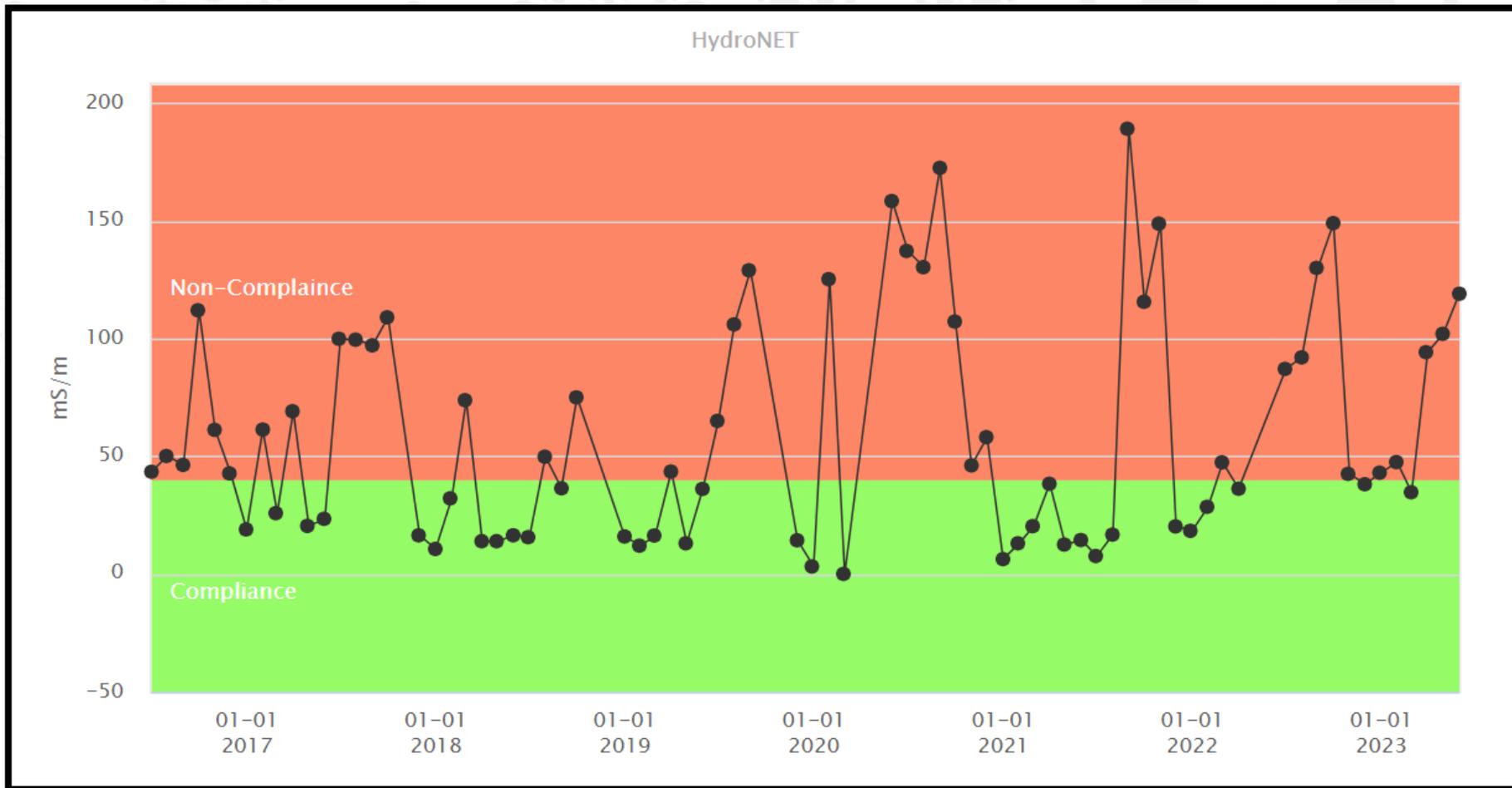
pH complied with the TWQR throughout the reporting time within the Usuthu Catchment, **except** for Ntanta and Wokolo Streams at Nooitgesein due to coal mining activities within the which where acid in in December 2022.

WATER QUALITY STATUS: ELECTRICAL CONDUCTIVITY

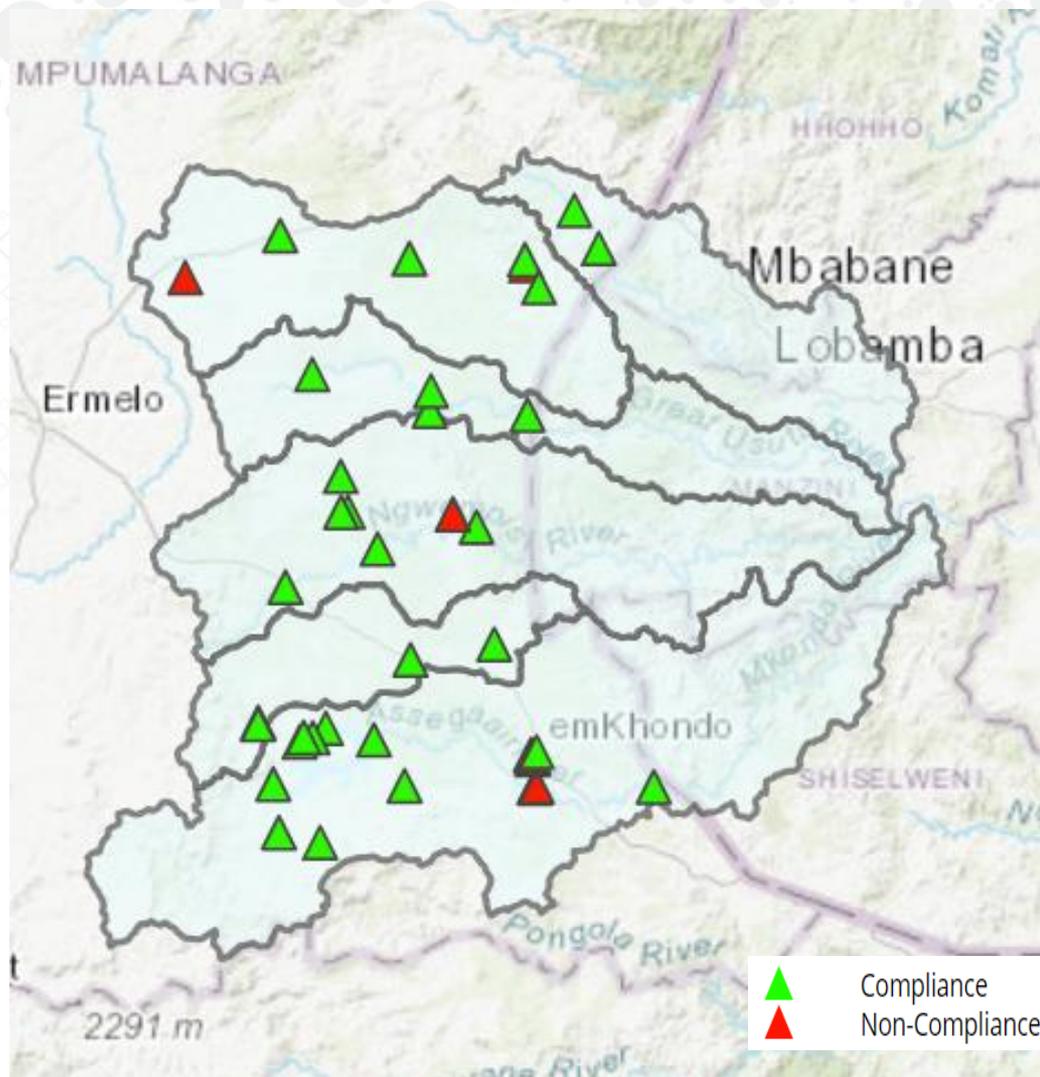


Electrical Conductivity (EC) **complied** with the TWQR within the Usuthu Catchment, **except** for Chrissiessmeer lake, Egude River (Driefontein area, known as Saul Mkhizeville), Klipmisselspruit downstream of the WWTWs and tributary of Klipmisselspruit downstream of industrial area (eMkhondo area).

TRENDS: ELECTRICAL CONDUCTIVITY AT EGUDE RIVER

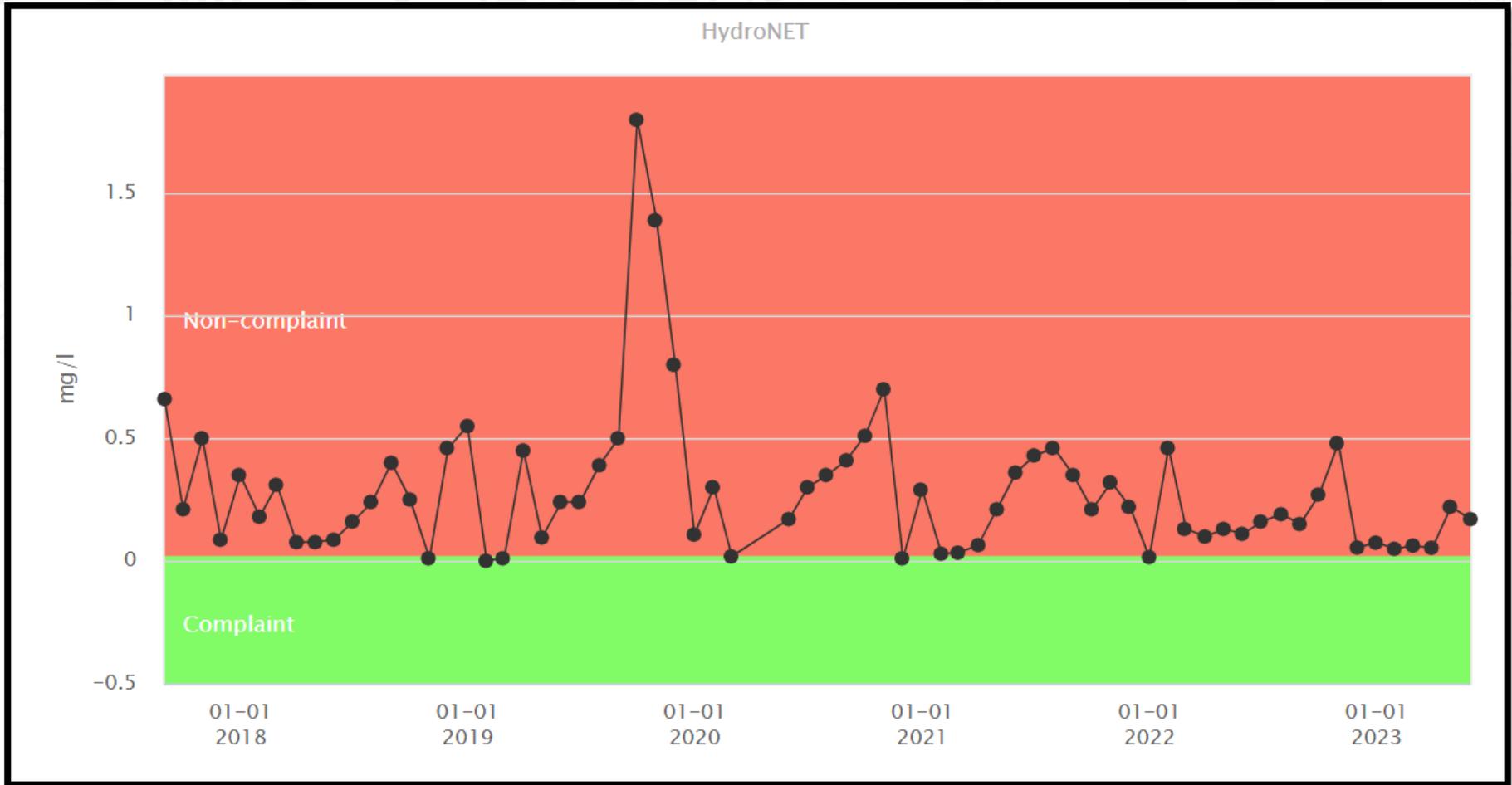


WATER QUALITY STATUS: PHOSPHATE

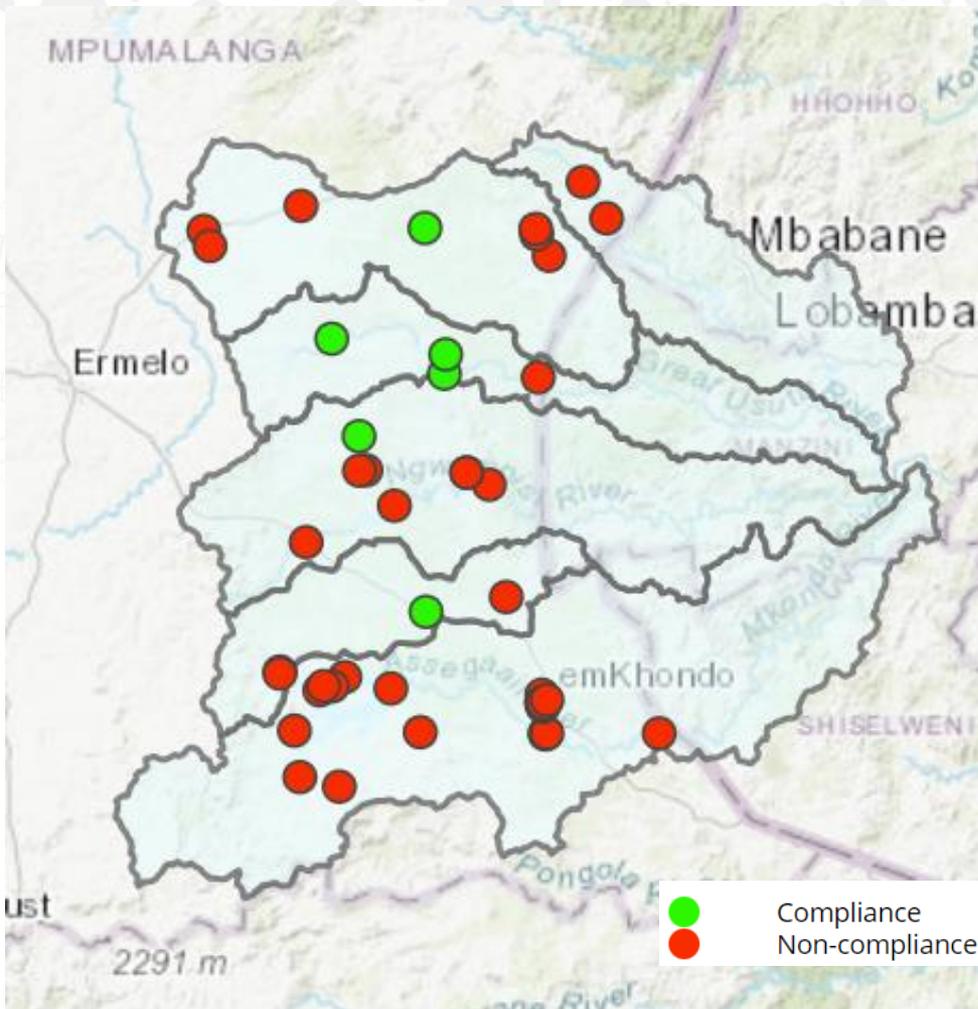


PO₄ **complied** with the TQWR throughout the reporting time within the Catchment, **except** for Chrissiessmeer lake (Chrissiesmeer), Thole River (Amsterdam), Klipmisselspruit and its tributaries (eMkhondo) due to poor operation and maintenance of WWTWs and its associated infrastructure as well as poor sanitation services.

TRENDS: PHOSPHATE AT THOLE RIVER (AMSTERDAM)

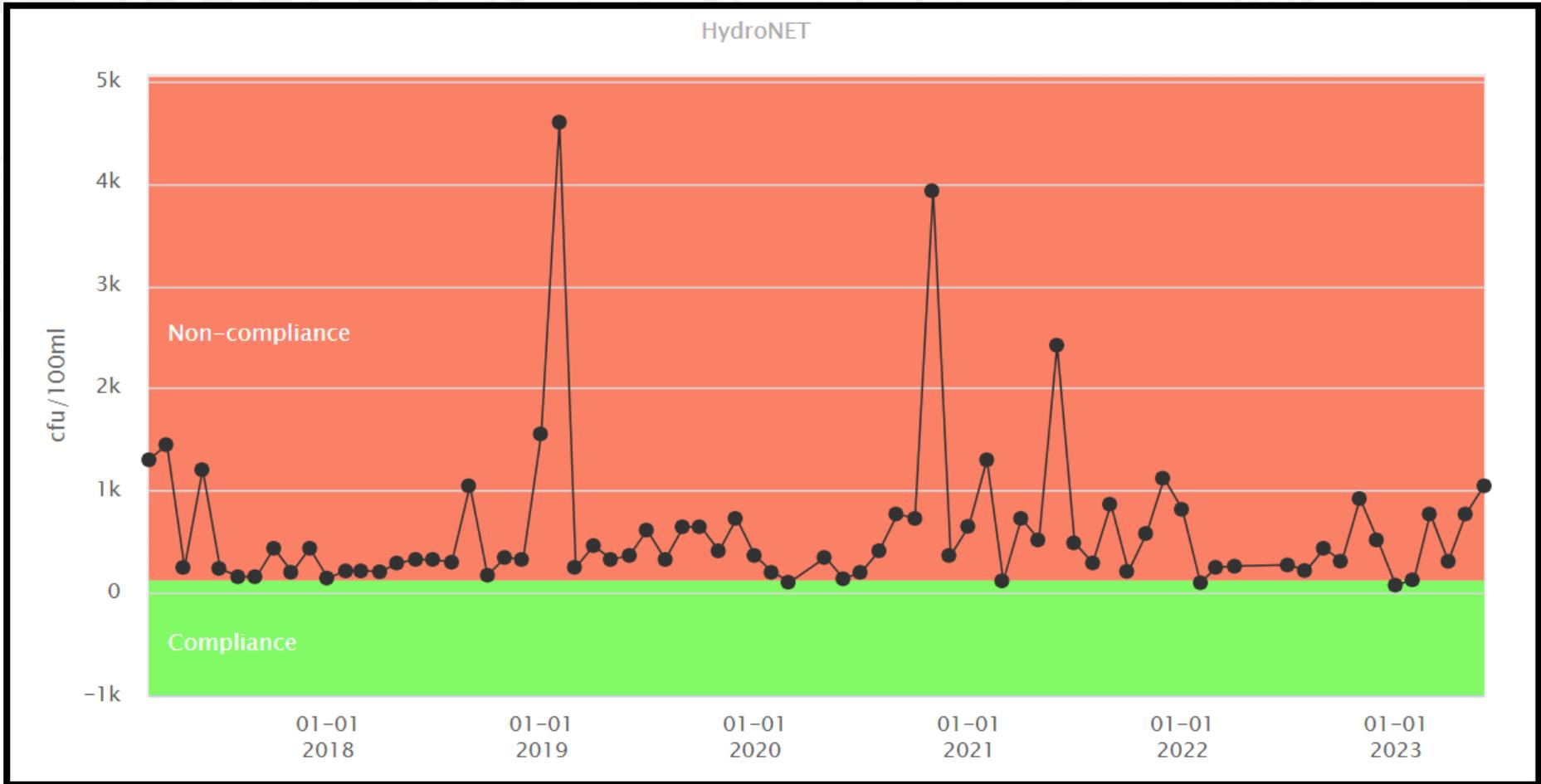


WATER QUALITY STATUS: E COLI



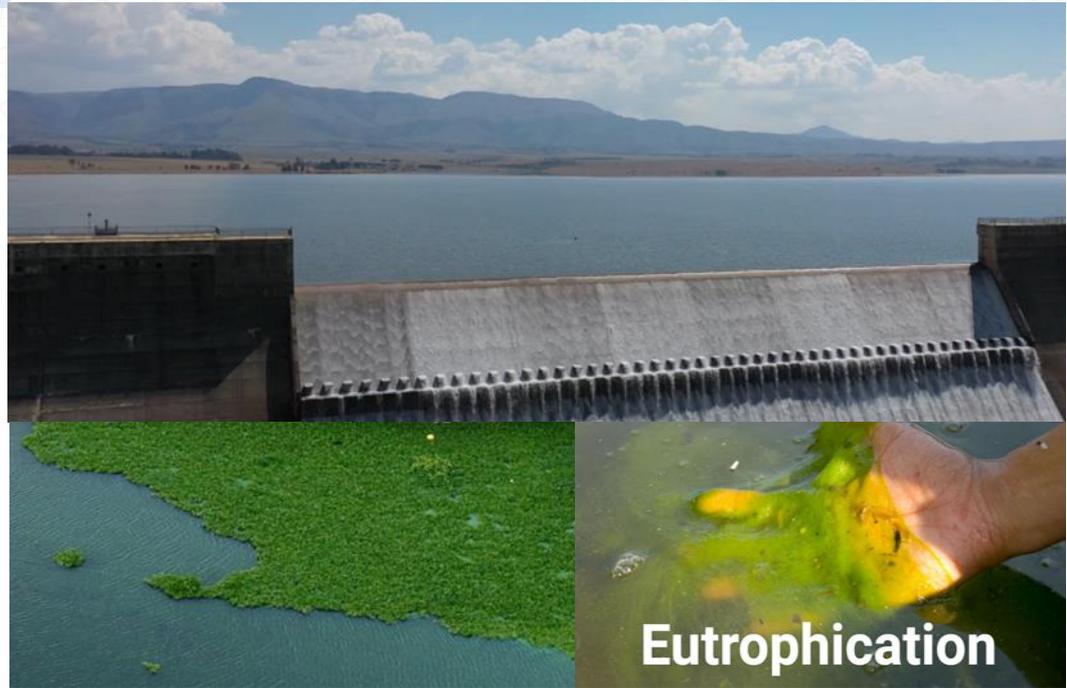
E. coli counts **did not comply** with the set TWQR for most of the monitoring sites. High concentrations within residential areas due to the WWTW which discharge partially treated effluent, overflowing sewer pump stations and illegal waste dumping. Compliance was observed at the Westoe Dam, one point in the Mpuluzi River system, two points in the Usuthu River system and one point in the Ngwempisi and Hlelo River systems.

TRENDS: E COLI AT ASSEGAAI RIVER



RESOURCE QUALITY STATUS

EUTROPHICATION STATUS OF THE MAJOR DAMS WITHIN THE WMA



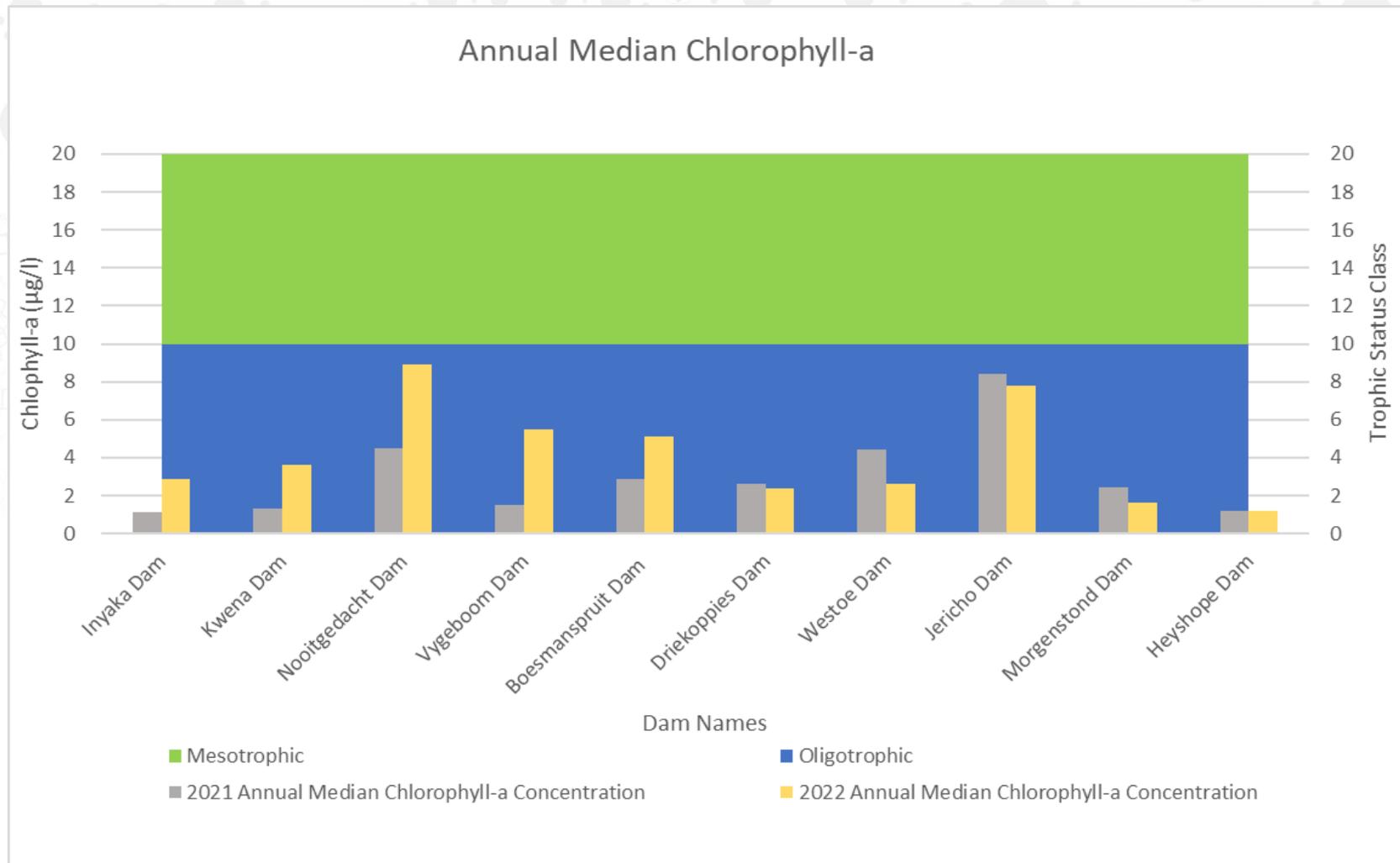
TROPHIC STATUS

- **Trophic Status** is the degree of nutrient enrichment and of the associated eutrophication problems of an aquatic ecosystem.
- Trophic status classes used for assessment of dams in South Africa.

1. Oligotrophic	low in nutrients and not productive in terms of aquatic and animal plant life;
2. Mesotrophic	intermediate levels of nutrients, fairly productive in terms of aquatic animal and plant life and showing emerging signs of water quality problems;
3. Eutrophic	rich in nutrients, very productive in terms of aquatic animal and plant life and showing increasing signs of water quality problems; and
4. Hypertrophic	Very high nutrient concentrations where plant growth is determined by physical factors. Water quality problems are serious and can be continuous.

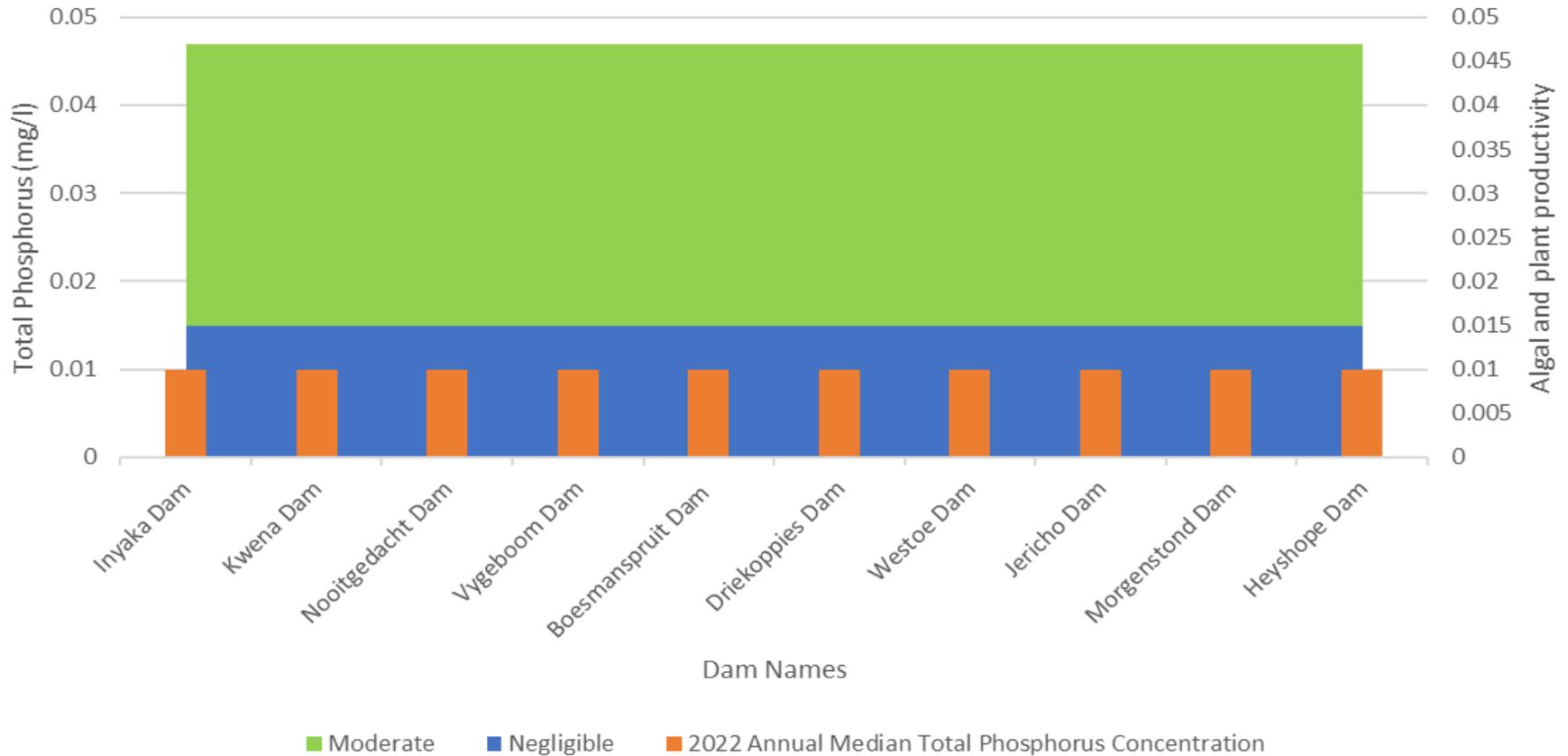


EUTROPHICATION STATUS: CHLOROPHYLL-A



EUTROPHICATION STATUS: TOTAL PHOSPHORUS

Annual Median Total Phosphorus



KEY ISSUES RAISED BY STAKEHOLDERS: 2022/23 CMF

No.	Issue raised	Sub-catchment	Proposed Action	Progress and recommendations
1.	A stakeholder from Driefontein, a beneficiary of the Land Restitution programme requested assistance with the processes of getting a water use license	Usuthu	The Piet Retief IUCMA office was mandated to assist the stakeholder in applying for a water use authorization.	The stakeholder was assisted to obtain a General Authorization (GA)
2.	The prevalence of mining applications in Mkhondo was raised as a serious challenge for the agriculture sector. The challenge about illegal mining activities in the rehabilitated Kangra property, a communal property association (CPA) land in Ngema area. This issue was reported to DMRE, but nothing has happened so far	Usuthu	The Chairperson of the forum, Mr Peter Venter will send the list of mines to the IUCMA for further investigation..	The list was assessed by the Water Use Authorisation division, and it was discovered that only two mines were falling under the Inkomati-Usuthu water management area, and they are all authorised
3.	The Swallownest community in Ward 6 in Mkhondo Local Municipality requested the IUCMA to conduct an education and awareness campaign on Water Resources Protection with focus on wetlands	Usuthu	The Institutions and Participation from IUCMA to plan a campaign around the area	The awareness campaign was conducted

KEY ISSUES RAISED BY STAKEHOLDERS: 2022/23 CMF

No.	Issue raised	Sub-catchment	Proposed Action	Progress and recommendations
4.	Mining applications at Mkhondo was raised as a serious challenge for the agriculture sector. Mining activities taking place at Kangra land where they have rehabilitated was reported to DMRE, but nothing is happening (Ngema Area up to Dirkiesdorp) where mining is taking place on the CPA land.	Usuthu	<p>The former chairperson submitted a list of mines to for the IUCMA to investigate the WUL status and was referred to the relevant division. The findings were that most of the mines on the list falls under Pongola catchment. Except two with the following WUL status:</p> <ol style="list-style-type: none"> 1. Variswane Investment (Pty) Ltd- licence issued on 2022/09/30 and the application date 07/06/2022 WU24717. 2. Notre Coal application – prospecting application: Pre-application WU27528. 	WUA Manager provided feedback
5.				

CONCLUSIONS AND RECOMMENDATIONS

- **Water Quantity**
- The Usutu catchment has limited surface water surplus, but this is a low assurance surplus relating to the large number of underutilized farm dams in the catchment.
- The implementation of the EWR will result in a deficit in the Ngwempisi catchment and in the future, it may be necessary for the Morgenstond and Jericho dams to contribute to the EWR of this catchment.
- More measures can be used to enhance the yield in the catchment:
 - I. Construct off-channel dams and fill these dams when there is surplus water available (wet season).
 - II. Construct in-channel dams, but the release of water is required to ensure that downstream users are not negatively impacted.
 - III. Groundwater use in catchments where this does not impact the baseflow.



CONCLUSIONS AND RECOMMENDATIONS

Water Quality

- The identified issue of concern concerns Chrissiessmeer lake, Egude River (Driefontein area, known as Saul Mkhizeville) and Klipmisselspruit and its tributaries (eMkhondo area) where salts and nutrients, mostly downstream of WWTWs pose a challenge (EC & PO₄).
- Eutrophication status for all the dams within the WMA is good.
- Municipalities, mines to implement long term solution to resolve noncompliant poorly operated and maintained WWTW's and its associated infrastructure i.e., sewer pump stations, manhole.
- It is recommended that the land use activities impacting on water resources quality be efficiently controlled by all relevant stakeholders / users through Source Directed Controls (SDC) as per the provision.



THANK YOU

