

Water Quality Monitoring Report for the Kangra Coal KwaZulu-Natal Operations: First Quarter, 2026 Monitoring Period

Report

Version - Draft

08 June 2026

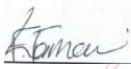
Kangra Coal (Pty) Ltd

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EXECUTIVE SUMMARY

GCS (Pty) Ltd has been contracted by Kangra Coal (Pty) Ltd (hereafter referred to as 'Kangra' /the client) to undertake monitoring of their mining operations in the KwaZulu-Natal province:

- Welgedacht Operations: located within the Utrecht Area and comprises four old mining operations namely Aasvoëlskrans, Umgala, Utrecht and Zimbutu;
- Natal Cambrian: comprises two old mining operations namely, Ballengeich (situated 15 km south of Newcastle) and the old underground coal mine operations (situated close to Dannhauser) also known as Smitties Dump;
- Longridge: situated between Paul Pietersburg and Piet Retief; and
- Natal Ammonia: situated approximately 20 km east of Vryheid.

The monitoring programme includes monthly and/or quarterly groundwater and surface water sampling, management of a water quality database and compilation of quarterly and annual water quality monitoring reports.

This report constitutes the first quarter monitoring report, which includes all sampling events undertaken between February 2026 and April 2026.

The report aims to provide an overview of the sampling events, including findings on surface water and groundwater levels and quality around the mines, to determine compliance with the legislated water quality objectives of the catchment.

Summary of the 2026 first quarter report findings:

The available monitoring results have confirmed that impacted mine water is decanting into the environment and the full extent of the impact downgradient from each operation has not been sufficiently delineated within all catchments. Additionally, the full impact on the underlying groundwater has not been fully delineated and requires additional monitoring points to assess the full extent.

Welgedacht Operations:

Groundwater Levels:

The groundwater levels in the Welgedacht area remained fairly stable in the first quarter, showing a change of <0.80 m.

Water Quality:

- The mining operations in the Welgedacht area are all non-operational mines and the impact is associated with existing infrastructure, such as discard dumps, as well as old underground working. Mine water decant from the mined-out underground workings have been observed to impact the surface and groundwater environments.

- Of the mining operations in the Welgedacht area, Aasvoëlkrans poses the highest known risk to the groundwater environment due to acid mine drainage conditions observed on site, specifically at borehole A-BH1, associated with seepage from the underground workings. Saline mine drainage conditions are consistently observed at Umgala, Utrecht and Zimbutu.
- Mine water decant from all sites significantly impact the surface water environment; the most significant impact has been observed at Zimbutu at Pit 19 which has consistently displayed acid mine drainage conditions.
- The current extent of the monitoring network is considered to be insufficient to capture potentially impacted areas at several of these sites.

Natal Cambrian Operations:

Groundwater Levels:

- Water levels changed by <0.38 m at most all sites in the first quarter. Borehole GW1 is an artesian borehole, which constantly discharging contaminated groundwater (decanting AMD) from the Ballengeich underground workings. The most significant fluctuations were observed at GW6, both historically and presently.

Water Quality:

- Several monitoring points at this site display impacted water quality as a result of seepage or decant from the underground workings, opencast workings, discard dump and/or PCDs. The data shows a high risk to both the surface water and groundwater environment from the Ballengeich operations.
 - Drinking water borehole GWO, which lies within the mine boundary, indicated that predominantly all measured parameters were below the SANS guideline values in April 2026. TDS ranging between 450 to 1 000 mg/l and EC ranging between 70 to 150 mS/m, may result in water with a noticeable salty taste, but is well tolerated. No effects on plumbing or appliances are expected (DWAF, 1996).
 - Calcium concentrations ranging between 32 and 80 mg/l have no health effects. Increased scaling problems and lathering of soap impaired expected (DWAF, 1996).
 - Sodium concentrations between 100 and 200 mg/l results in a faintly salty taste, but no health effects expected (DWAF, 1996).

- Fluoride concentrations between 1.0 and 1.5 mg/l may result in slight mottling of dental enamel to occur in sensitive individuals, no other health effects are expected (DWAF, 1996).
- Manganese concentrations between 0.05 and 0.10 mg/l are within a tolerable range, although slight straining may occur. No health effects are expected (DWAF, 1996).

Longridge Operations:**Water Quality:**

- There is no groundwater monitoring network at the Longridge site, resulting in a significant data gap.
- The main source of concern at Longridge is the discard dump. The impact of decant from the rehabilitated discard dump is evident at sample points LRVN5, LRVN6 and LRVN7. Additional points are required to determine the extent of the impact.

Natal Ammonia Operations:**Water Quality:**

- Groundwater data from the newly drilled boreholes around the discard dump (Mnt BH2 and Mnt BH3) indicate an impact on water quality. Future data will confirm the trends.
- Similar to Longridge, the main source of concern at Natal Ammonia is the rehabilitated discard dump. Decant from the discard dump has resulted in acidic pH and high sulphate and metal concentrations, which indicate acid mine drainage.
 - There is a plan in place to remove the discard dump and use a passive treatment option to treat the water, most likely an artificial wetland.

Table 0-1: Summary of the key issues identified within the Kangra Coal KwaZulu-Natal operations

Mining Operation		No. of groundwater points	No. of surface water points	Do Acid Mine Drainage or Saline Mine Drainage conditions occur?	Surface Water			Groundwater			Do the PCDs have the capacity to handle the identified issues?	Does the current monitoring system effectively monitor the key risk components?
					Does the mine decant into the nearby surface water body?	Source	Significance of impact (Low, Moderate, High)	Does the mine seep into the surrounding aquifer?	Source	Significance of impact (Low, Moderate, High)		
Welgedacht	Aasvoëlskrans	3	6	Acid Mine Drainage	Yes	Old Underground Workings	Moderate	Yes	Old Underground Workings	High	Yes	An up-gradient borehole and upstream surface water points are required.
	Umgala	6	3	Saline Mine Drainage	Yes	Old Underground Workings	High	Yes	Old Underground Workings	Moderate to High	No	Boreholes GCSU 1 and GCSU 12 need to be re-established.
	Utrecht	2	10	Saline Mine Drainage	Yes	Old Underground Workings & Rehabilitated Discard Dump	High	Yes	Old Underground Workings & Rehabilitated Discard Dump	Moderate	No	Up-gradient borehole required.
	Zimbutu	3	14	Acid Mine Drainage	Yes	Old Underground Workings & Discard Dump	High	Yes	Old Underground Workings	Moderate	No	Up-gradient borehole required.
Natal Cambrian	Ballengeich	15	14	Acid Mine Drainage	Yes	Old Underground Workings, Opencast Workings, Discard Dump & PCD	High	Yes	Old Underground Workings, Opencast Workings, Discard Dump & PCD	High	No	Boreholes P1 and P2 need to be re-established. Add boreholes UGBH 1, UGBH 3, UGBH 4 and UGBH 5 to the network.
Longridge		0	9	Saline Mine Drainage	Yes	Rehabilitated Discard Dump	Moderate	No groundwater data is available			N/A	Up-gradient and down-gradient boreholes required. Additional surface water points are required to monitor the tributary to the south of the underground workings.
Natal Ammonia		4	6	Acid Mine Drainage / Saline Mine Drainage	Yes	Old Underground Workings & Rehabilitated Discard Dump	High	No groundwater data is available			N/A	The Borehole Orange Pump needs to be re-established.

Recommendations

Any future mining activities should consider the amendment to the current monitoring program to include any sources, pathways and receptors potentially impacted by such activities.

A full audit of the monitoring programme was completed in September 2022, which addressed all information gaps in the monitoring network. The following additional monitoring is recommended, based on the current network:

- It is recommended that boreholes GCSZ2, GCSZ3 (Zimbutu) and Orange Pump (Natal Ammonia) be re-established.
- Four boreholes were drilled in the Ballengeich area in 2013 (UGBH 1, UGBH 3, UGBH 4 and UGBH 5); refer to the Ballengeich monitoring map in **Appendix B**. All four boreholes have historically indicated neutral pH and better water qualities and should therefore be added to the monitoring network to better analyse the impact of the mine.
- A groundwater monitoring network at Longridge should be established.
- Once-off monitoring at the adit at Natal Ammonia should be conducted to better analyse the source of the impacted water quality at VN Waterfall.
- Monitoring at the Old Cambrian Operation, comprising the old underground mine and discard dump (Smitties Dump), should be considered.

All wells should be surveyed to assess groundwater flow directions.

Options for mitigation or remediation measures should be prioritized at Ballengeich to control and reduce decant and seepage at the site, which will reduce the majority of Kangra's KwaZulu-Natal sites' collective impact.

- Artesian borehole GW1 should be decommissioned according to the ASTM D5299 - 99 Standard Guide for Decommissioning of Boreholes.
- Full rehabilitation of the Discard Dump;
- Rehabilitation of all coal fines around the Discard in the ponds and old river;
- Ensure that rehabilitation of the old opencast workings is maintained and that sinkholes are fixed;
 - Phytoremediation is the preferred management measure because it will reduce recharge, require minimal input in terms of maintenance, management and energy/electricity and will not produce hazardous waste products.

- One of the water management measures that are applied at Ballengeich is the prevention of water ingress into the old opencast areas through phytoremediation. Fractal Forest was asked by GCS on behalf of Kangra to research and examine the growth potential of trees on coal-mined sites. Tree planting trials have been taking place since 2009 and the latest tree planting took place during December 2014 and January 2015.
- Surface operational implementation; ensure that the Siding (and other smaller operations) has its stormwater management - excessively contaminated surface water is currently flowing across to Ballengeich mine.
- Establishment of tree blocks to reduce recharge;
- Once all of the above is in place, continue with water monitoring for 24 months and undertake new risk and impact assessment on the Ngagane River; and
- Determine treatment requirements based on the risk.
 - Manage groundwater levels by pumping clean underground water from the western side of the workings and discharge; this will require a pre-feasibility assessment to understand the correct balance/equilibrium. The water can also be used to dilute the Horn River upstream or irrigate the water on tree plantations.
 - Implement a treatment plant to treat decant on the eastern side of the N11 (active or passive).

In terms of the remaining sites, all contaminated water generated should be contained within the Mining Right Area in appropriately lined waste storage facilities. The following is recommended for the management of the waste facilities on site (such as pollution control dams, return water dams and discard dumps):

- The lining of the dams is recommended to prevent seepage into the groundwater environment.
- Potential seepage in the shallow aquifer system, from the dams, should be monitored with down-gradient shallow piezometers.
- Effective management of storm water entering the site as well as controlling seepage from the dams will reduce the majority of the impact on the local aquifer.
- Phytoremediation down gradient of the waste management systems across the sites. This is considered to be the most effective option and can also be applied at the toe of the discard dump at Umgala.
- Passive treatment using biological sulphate treatment options.

- There is a plan in place to remove the discard dump at Natal Ammonia and use a passive treatment option to treat the water, most likely an artificial wetland.
- Seepage from the discard dump at Utrecht must be controlled and no decant should be allowed to enter the Dorpspruit. Options for controlling the decant should be investigated.
- Data regarding the current level of flooding within the Aasvoelskrans workings may be of value in understanding oxidation/reduction conditions within the mine workings and distinguishing between flooded areas and dry areas, which would require mine workings and coal seam contours for the area.
- The priority is to determine if recharge and oxidation are higher than they should be, either due to subsidence within the old mine workings or unrehabilitated areas in old opencast workings, resulting in acid mine drainage or saline mine drainage.
- Passive and active treatment options need to be assessed; pre-feasibility and feasibility studies will be required.
- The closure plans should be updated, where necessary.

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DISCLAIMER

The opinions expressed in this Report have been based on the information supplied to GCS Water and Environment (Pty) Ltd (GCS) by Kangra Coal (Pty) Ltd. GCS cannot be held liable for the accuracy of the historical data provided.

GCS has exercised all due care in reviewing the supplied information. Whilst GCS has compared key supplied data with expected values, the accuracy of the results and conclusions are entirely reliant on the accuracy and completeness of the supplied data. GCS does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them.

Opinions presented in this report, apply to the site conditions and features as they existed at the time of GCS's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which GCS had no prior knowledge nor had the opportunity to evaluate.

LIST OF ABBREVIATIONS

AAS	Aasvoëlskrans
BC	Before Confluence
BLG	Bellengeich
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resource
DS	Downstream
DWAF	Department of Water and Forestry
DWS	Department of Water and Sanitation
EC	Electrical Conductivity
Fe	Iron
ISO	International Standards Organisation
LON	Longridge
mg/l	Milligrams per litre
Mn	Manganese
NAM	Natal Ammonia
No.	Number
PCD	Pollution Control Dam
RWD	Return Water Dam
SABS	South African Bureau of Standards
SANS	South African National Standard
SAWQGTV	South African Water Quality Guidelines Target Values
SO ₄	Sulphate
TDS	Total Dissolved Solids
UMG	Umgala
US	Upstream
UTR	Utrecht
ZIM	Zimbutu
ZOI	Zone of Impact

1 INTRODUCTION

GCS (Pty) Ltd has been contracted by Kangra Coal (Pty) Ltd (hereafter referred to as 'Kangra' /the client) to undertake monitoring of their mining operations in the KwaZulu-Natal province, which encompasses the Natal Cambrian, Natal Ammonia, Longridge and Welgedacht operations.

The monitoring programme includes monthly and/or quarterly groundwater and surface water sampling, management of a water quality database and compilation of quarterly and annual water quality monitoring reports.

This report constitutes the first quarter monitoring report, which includes all sampling events undertaken between February and April 2026.

The report aims to provide an overview of the sampling events, including findings on surface water and groundwater levels and quality around the mines, to determine compliance with the legislated water quality objectives of the catchment.

1.1 Scope of Work

This monitoring report focuses on the KwaZulu-Natal operations. The Scope of Work for the entire Kangra Coal project is as follows:

- To undertake the monthly and quarterly surface and groundwater quality monitoring for both the operational and closed mines, including Panbult Siding, in Mpumalanga and KwaZulu-Natal;
- To undertake the monthly drinking water quality monitoring for the Maquasa and Panbult Siding operations in Mpumalanga;
- To undertake monthly flow measurements of V-Notch weirs in the Welgedacht area;
- To undertake biannual SASS and IHAS sampling at the Maquasa, Ballengeich, Kusipongo and Panbult operations;
- Compile and submit monthly laboratory water analysis data/results to Kangra Coal;
- Compile and submit quarterly surface and groundwater quality reports for both the operational and closed mines, including Panbult Siding, in Mpumalanga and KwaZulu-Natal, based on both the monthly and quarterly results, to Kangra for submission to the authorities;
- Compile and submit four biannual biomonitoring reports for the Maquasa, Ballengeich, Kusipongo and Panbult operations.

2 DESCRIPTION OF THE STUDY AREA

This monitoring report focuses on the KwaZulu-Natal operations, as indicated in Figure 3-1:

Welgedacht Operations:

- Aasvoëlskrans (AAS) - old opencast operations and old underground mine
- Umgala (UMG) - old opencast operations, underground workings and discard dump
- Utrecht (UTR) - old underground mine
- Zimbutu (ZIM) - old opencast operations and old underground mine

Natal Cambrian Operations:

- Ballengeich (BLG) - old opencast operations and old underground mine
- Old Cambrian Operation - old underground mine and discard dump (Smitties Dump)

Longridge Operations:

- Longridge (LON) - old underground mine

Natal Ammonia Operations:

- Natal Ammonia (NAM) - old underground mine

2.1 Background Information

Currently, Kangra Coal (Pty) Ltd has 18 (eighteen) coal mining facilities that are situated within the provinces of KwaZulu-Natal and Mpumalanga in South Africa. Kangra is required by the Department of Water and Sanitation (DWS), Department of Mineral Resources (DMR) and Department of Environmental Affairs (DEA) to report on the status of the water quality (and levels) of nearby and on-site water bodies and boreholes.

The seven (7) mining facilities or operations located in KwaZulu-Natal are all currently non-operational. The mining operations have been ceased, rehabilitated and/or decommissioned.

2.2 Geographic Location

Welgedacht Operations:

The Aasvoëlskrans mine section is located approximately 8.8 km northwest of the town of Utrecht and consists of infrastructure, pollution control dams and a discard dump. The mine has been rehabilitated and is not in operation. The historical mining rights area falls within farms Leeuwfontein 94 Re Sub A (of 2), Leeuwfontein 94 Re Sub 10 (of 5), Leeuwfontein 94 Re Sub 5 (of Sub 3), Leeuwfontein 94 Re Sub C (of 2), Utrecht 91Re Sub B, Utrecht 91Re Sub 12, Utrecht 91Re Sub 18 and Utrecht 91Re Sub 9. The Aasvoëlskrans mine section is planned for future mining.

The Umgala and Knights Hill operations are located approximately 5.2 km south of Utrecht and consist of a wash plant (existing), infrastructure, discard dump, pollution control dams and open cast and underground workings. Most of these mining operations have been rehabilitated.

The Utrecht mining operation consists of an old process plant area, sewage works, discard dump, pollution control dam, historical adits, wash plant and infrastructure. The large discard dump has been rehabilitated and the wash plant demolished. The historical mining rights area of Utrecht falls within farms Leeufontein 94 Re 7, Re 3/2, Re 10/5, Re 5/3, Re 9/2, Re 2, Zwartkop 91 11/2, 12/ b, Re 3, Politiek 67 Re 4/3, Politiek 67 6/2, Zwartkop Re 3, Waterval Portion 2, Waterval Portion 3, 5 & 7, Utrecht Lease 3 & 6 and Townlands 8

The Zimbutu operation is located approximately 6.7 km southeast of the town of Utrecht and consists of a washing plant, discard dump, open cast pit and underground mine workings. Most of the operations have been closed and rehabilitated. The historical mining rights area of Zimbutu falls within farms Tusschenbie 167 HT, Remaining Extent of Ptn 2, Ptn 3, Ptn 5, Ptn 1, Remainder of Ptn 5, Ptn 7, Tusschenbie 167 HT, Ptn 2, Ermelo Ptn 1, Tusschenbie 167 HT, Ptn 8, Magdalene 443 and Burou Sub 12.

Natal Cambrian Operations:

The Ballengeich operation is located approximately 15 km south of Newcastle and consists of a historic open cast pit, discard dump, underground mine workings, adits and shafts, pollution control dams and infrastructure. The adits and shafts have been sealed, and sections of the open cast mine backfilled and rehabilitated. The Ballengeich operation is currently not operational. The historic mining rights area falls within the farm Ballengeich Ptn. 19 - Sub 1 of Ballengeich 3299. The colliery falls within the upper catchment of the Horn River, which subsequently drains into the Ngagane River.

A second Old Cambrian Operation - The Natal Cambrian Mine is located 3 km northeast of Dannhauser in KwaZulu-Natal. Natal Cambrian was operational from 1903 to 1958 when the mine was abandoned without being rehabilitated. The coal discard dump is located on two properties, namely Frede 3741 and Try Again 8674. The coal discard dump has been standing un-rehabilitated for decades posing an environmental hazard that has severely affected the adjacent watercourse. A preliminary water and waste management plan was conducted in 2013 by GCS.

Longridge Operations:

The Longridge operation is located approximately 34 km northwest of Vryheid and consists of a discard dump, pollution control dams and underground mine workings. The Longridge discard dump and pollution control dams have been rehabilitated. The Longridge operation surface rights fall within certain portions of the Farm Twisthoek 84, Boschkrans 69 and Mooihoek 34. Longridge mine is not operational. Decant from the underground workings subsequently drains into the Bazangoma River.

Natal Ammonia Operations:

The Natal Ammonia (Mount Ngwibi) operation is located approximately 25 km east of Vryheid and consists of mining infrastructure, underground mine workings, dams and a discard dump. The operations at Mount Ngwibi have been decommissioned. The historical mining rights area falls within farms Wintershoek No. 295, Kromellenboog No. 303 and Riversdale No. 372. Various non-perennial streams and springs occur in the mountainous area of NAM. NAM is located in the headwater of the Mkuzi and Enyati (Swart Mfolozi) River catchment, which falls in the Vryheid Magisterial District. The Regional Services Council for this area is the Zululand Regional Council.

3 MONITORING NETWORK

The monitoring network is divided into seven (7) areas and focuses on the different mining operations at the Natal Cambrian, Natal Ammonia, Longridge and Welgedacht operations. The monitoring status per operational area is detailed in Table 3-1 and Table 3-2.

The monitoring points locality maps are available in **Appendix B** and the field data is available in **Appendix C**.

- Two new surface water monitoring points were added to the Ballengeich monitoring network in March 2022 to better monitor the Ngagane River, namely Ngagane US and Ngaagane DS.
- An additional quarterly monitoring point, VN5, was added to the Ballengeich monitoring network in the second quarter of 2022.
- Monitoring points GCSU2, GCSZ2 and GCSZ3 at Umgala and Zimbutu were removed from the monitoring network by the client in the second quarter of 2022.
- Seven additional quarterly monitoring points (Mnt VN1, Mnt VN2, Mnt VN3, Mnt VN4, Mnt BH1, Mnt BH2 and Mnt BH3) were added to the Mount Ngwibi monitoring network in the second quarter of 2024.
- Three boreholes (UGBH1, UGBH3 and UGBH5) were drilled in 2013 to assist in understanding the water quality at the site and were added in January 2025 to the monitoring network.

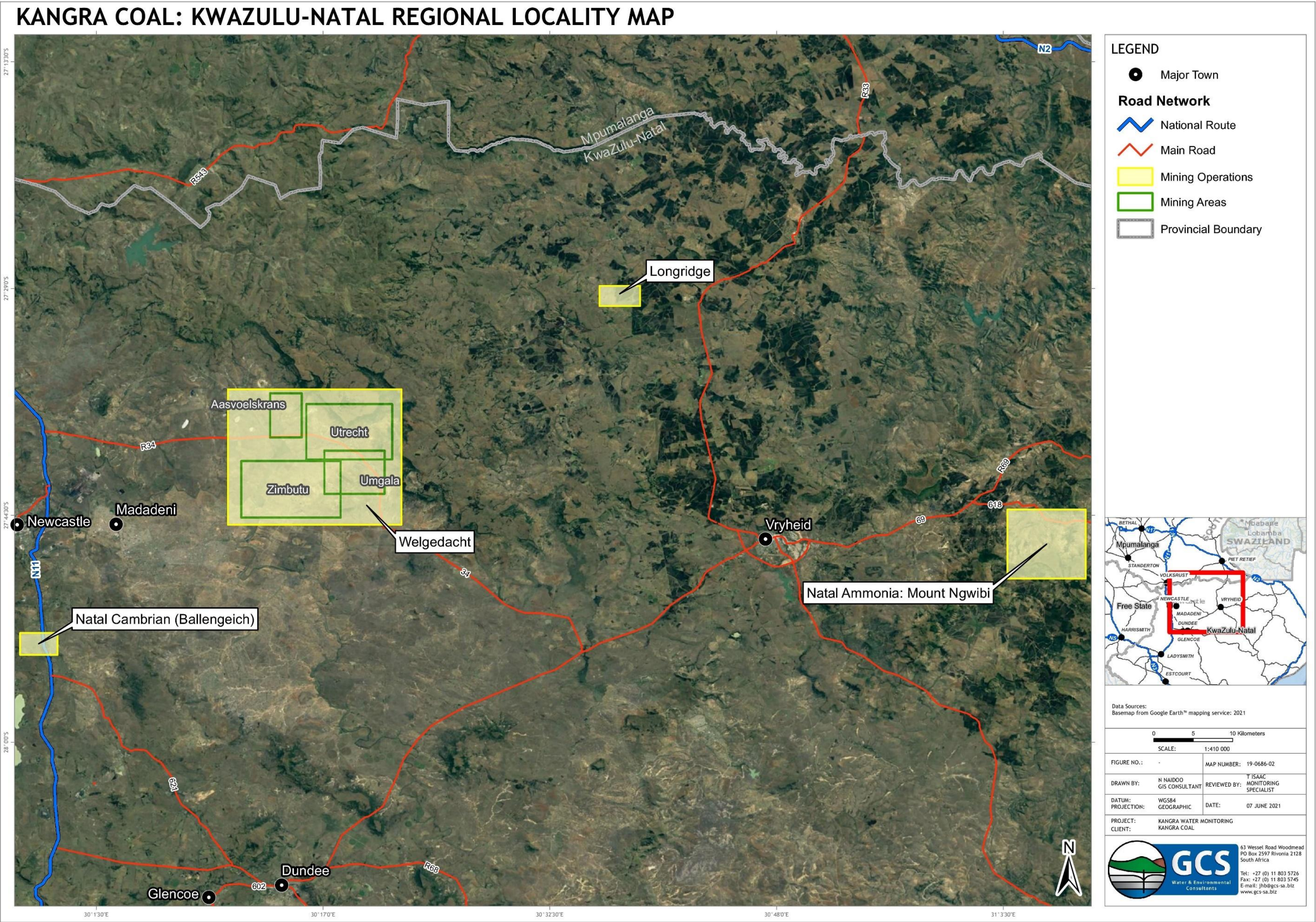


Figure 3-1: Locality map of the Kangra Coal KwaZulu-Natal operations

Table 3-1: KwaZulu-Natal Operations Surface Water Monitoring Status

Site ID	Latitude	Longitude	Description	Type	Monitoring Frequency	Status		
						Feb-26	Mar-26	Apr-26
AASVOËLSKRANS								
Bottom Dam	-27.61013	30.25006	Located downgradient of the old underground workings at AAS.	Dam	Quarterly			●
Upper Dam	-27.60704	30.25307	Located downgradient of the old underground workings at AAS.	Dam	Quarterly			●
VN 6	-27.6178	30.23587	Stream located down-gradient of the old underground workings at AAS.	Stream	Quarterly			●
MM	-27.61783	30.235	Stream located down-gradient of the old underground workings at AAS.	Stream	Quarterly			●
Boshoffsvlei	-27.65122	30.23234	Stream located ±5.7 km downstream of the old underground workings at AAS; flows into the Dorpspruit.	Stream	Quarterly			●
A-SW1	-27.61021	30.24695	Stream located down-gradient of borehole A-BH3.	Stream	Quarterly			●
NATAL CAMBRIAN: BALLENGEICH								
SW 1	-27.89493	29.94267	Located near the BLG underground workings, sampled from the Horn River.	Stream	Monthly	●	●	●
SW 4	-27.88857	29.96494	Located downstream of the decant from the BLG underground workings; sampled from the Horn River.	Stream	Monthly	●	●	●
SW 6	-27.88498	29.9742	Compliance point for the Horn River, which flows into the Ngagane River.	Stream	Monthly	●	●	●
SW 9	-27.88655	29.97679	Located ±250 m from the underground workings.	Stream	Monthly	●	●	●
SW 10	-27.8796	29.97378	Located downstream of SW9 and ±1 km from the open-cast mine workings.	Stream	Monthly	●	●	●
Ngagane US	-27.918825	29.975381	Upstream point along the Ngagane River.	Stream	Monthly	●	●	●
Ngagane DS	-27.875048	29.974296	The downstream point is along the Ngagane River.	Stream	Monthly	●	●	●
SW 2	-27.89273	29.94788	Located near the BLG underground workings, sampled from the Horn River.	Stream	Quarterly			●
SW 3	-27.89271	29.94766	Located near the BLG underground workings, sampled from the Horn River.	Stream	Quarterly			Dry
SW 3(1)	-27.89271	29.94766	PCD is located next to the Ngagane River.	Dam	Quarterly			●
SW 5	-27.88781	29.96782	Located downgradient of the old opencast pit.	Dam	Quarterly			●
VN 5	-27.88501	29.97414	V notch along the Horn River.	Stream	Quarterly			●
VN 11	-27.89689	29.95326	Located between the opencast workings and the old opencast workings.	Stream	Quarterly			●
VN 3	-27.8894	29.96322	Located near the underground workings.	Stream	Quarterly			●
SW 7	-27.88814	29.97194	Located between the old opencast workings and the dam.	Dam	Quarterly			●
LONGRIDGE								
LRVN 1	-27.49182	30.60786	A water supply dam located down-gradient of LRVN 4.	Stream	Quarterly			NS
LRVN 2	-27.50142	30.61672	Stream flowing near the rehabilitated discard dump.	Stream	Quarterly			●
LRVN 3	-27.50138	30.61672	Stream flowing near the rehabilitated discard dump.	Stream	Quarterly			●
LRVN 5	-27.49652	30.617	Stream flowing near the rehabilitated discard dump.	Stream	Quarterly			●
LRVN 6	-27.49249	30.61992	Sampled downstream of LRVN 5.	Stream	Quarterly			●
LRVN 7	-27.50144	30.61607	Stream flowing near the rehabilitated discard dump.	Stream	Quarterly			●
LRVN 8	-27.48253	30.64278	Sampled downstream of LRVN 5 and LRVN 6.	Stream	Quarterly			●
LRVN 4	-27.4965	30.60394	Decant sampled down-gradient of the old LON underground workings.	Decant	Quarterly			●
LRVN 9	-27.483542	30.609569		Stream	Quarterly			●
NATAL AMMONIA: MOUNT NGWIBI								
House VN	-27.80836	31.08587	Stream situated south of the old Nam underground workings.	Stream	Quarterly			●
Pump VN	-27.80996	31.09535	Stream situated south of the old Nam underground workings.	Stream	Quarterly			●
Nongoma	-27.73658	31.09985	A stream which flows into the Mkuze River, situated ±3.3 km north of the old NAM underground workings	Stream	Quarterly			●
Alpha	-27.74783	31.14665	A stream which flows into the Mkuze River, situated ±3.6 km north of the old NAM underground workings	Stream	Quarterly			●
VN Waterfall	-27.78753	31.08098	Stream, which has a V-Notch Weir and is situated 200 m north of the discard dump.	Stream	Quarterly			NS
West of Dump Stream	-27.79037	31.07509	Decant west of discard dump at a stream crossing.	Stream	Quarterly			NS
Mnt VN1	-27.78957	31.08077	V-Notch located north of the discard dump.		Quarterly			NS
Mnt VN2	-27.79301	31.08159	V-Notch located south east of the discard dump.		Quarterly			NS

Site ID	Latitude	Longitude	Description	Type	Monitoring Frequency	Status		
						Feb-26	Mar-26	Apr-26
Mnt VN3	-27.79269	31.08206	V-Notch located east of the discard dump.		Quarterly			NS
Mnt VN4	-27.79036	31.07491	V-Notch located north west of the discard dump.		Quarterly			NS
UMGALA & KNIGHT HILL								
GCSS 2	-27.70078	30.28895	Sandspruit stream, which serves as the compliance point for both the ZIM and UMG areas.	Stream	Quarterly			Blocked
RWD	-27.68283	30.32451	Return Water Dam situated near boreholes GCSU1 and GCSU 2.	Dam	Quarterly			•
RWD Seepage	-27.67975	30.32703	RWD Seepage	Seepage	Quarterly			•
Weir 7B	-27.70068	30.28896	Weir sample point at Umgala.	V-notch	Quarterly			•
Mpongosa	-27.67052	30.32693	A stream which flows past the town of Utrecht and into the Dorpspruit River.	Stream	Quarterly			•
UTRECHT								
V-Notch 1	-27.6207	30.35453	Decant from the underground workings at UTR, flowing into the Dorpspruit.	Stream	Quarterly			•
VN 31	-27.62915	30.26615	Located down-gradient of the old underground workings of UTR, flows into the Boshoffvlei stream.	Stream	Quarterly			•
VN 7	-27.65469	30.30158	Located in a non-perennial stream upstream from Dorpspruit	Stream	Quarterly			•
VN 2	-27.64278	30.31674	Decant from the underground workings at UTR, flowing into the Dorpspruit.	Stream	Quarterly			•
V-Notch 3	-27.61981	30.27648	Located upgradient from the old underground workings of UTR, flows into the Boshoffvlei stream	Stream	Quarterly			NS
DWD	-27.64961	30.307	Located between UT1 and UT5, upgradient from Dorpspruit	Dam	Quarterly			•
W2	-27.63433	30.34599	Situated downstream of Upper Dorpspruit, near the water supply dam of the town Utrecht.	Stream	Quarterly			•
W1	-27.63382	30.34667	Situated downstream of Upper Dorpspruit, near the water supply dam of the town Utrecht.	Stream	Quarterly			•
Weir 6A	-27.67532	30.30832	Downgradient of Dorpspruit	Stream	Quarterly			•
Lower Dorpspruit	-27.65916	30.3044	Located near the Town Utrecht and downstream of W1 and W2; sampled from the Dorpspruit River.	Stream	Quarterly			•
Upper Dorpspruit	-27.62104	30.35769	Upstream of the UTR underground workings; sampled from the Dorpspruit River.	Stream	Quarterly			•
ZIMBUTU								
Control Point	-27.68291	30.22407	Located downstream from Lower Dorpspruit and Boshoffsvlei; flows into the Buffalo River.	Stream	Quarterly			•
Zim Decant	-27.68224	30.22473	Located downstream from Lower Dorpspruit and Boshoffsvlei; flows into the Buffalo River.	Stream	Quarterly			•
Ben's Dam	-27.71316	30.29174	Located near the ZIM underground workings.	Dam	Quarterly			•
Pit 19	-27.72866	30.25817	Located downgradient from DWD2, west from the ZIM underground workings.	Pit	Quarterly			•
DWD 1	-27.70514	30.28021	Old settling dam of the ZIM area, located down-gradient of the old discard dump.	Dam	Quarterly			•
DWD 2	-27.7179	30.272	Old ZIM settling dam, located southeast of the old discard dump.	Dam	Quarterly			•
Pit 4	-27.73577	30.27881	Located downgradient of the ZIM underground workings.	Pit	Quarterly			•
Buffalo US	-27.74005	30.20346	Located upstream from where the non-perennial river, coming from the underground workings flows into the Buffalo River	Stream	Quarterly			•
Buffalo DS	-27.74116	30.20426	Located downstream from where the non-perennial river, coming from the underground workings flows into the Buffalo River	Stream	Quarterly			•
Buffalo BC	-27.72886	30.19539	Located upstream from where the Buffalo River confluence with the Dorpspruit River	Stream	Quarterly			•
Dorp to Buffels	-27.72513	30.20527	Represents the confluence of the Dorpspruit River with the Buffels River.	Stream	Quarterly			•
VN 4	-27.71189	30.29947	Situated down-gradient and north of Donkey Shaft.	Stream	Quarterly			•
VN 8	-27.74052	30.24723	Situated down-gradient of Pit 19; flows into the Buffalo River.	Stream	Quarterly			•
Weir 8C	-27.71526	30.24717	Located down-gradient of DWD 2.	Stream	Quarterly			Dry

Table 3-2: KwaZulu-Natal Operations Groundwater Monitoring Status

AASVOËLSKRANS						
Site ID	Latitude	Longitude	Description	Type	Monitoring Frequency	Status
Apr-26						
AASVOËLSKRANS						
A-BH 1	-27.60801	30.2544	Located within the old underground workings of AAS.	Borehole	Quarterly	●
A-BH 2	-27.60789	30.25411	Located within the old underground workings of AAS.	Borehole	Quarterly	Blocked
A-BH 3	-27.60463	30.24766	Located approximately 750 m northwest of borehole A-BH 1 and is drilled into the old underground workings of AAS.	Borehole	Quarterly	●

Site ID	Latitude	Longitude	Description	Type	Monitoring Frequency	Status Apr-26
NATAL CAMBRIAN: BALLENGEICH						
GWO	-27.87937	29.96886	The water supply point is located near the BLG underground workings.	Tap	Quarterly	●
P1	-27.88985	29.96408	Located near the decant (GW 1) from the underground workings.	Borehole	Quarterly	NS
P2	-27.89056	29.96406	Located near the decant (GW 1) from the underground workings.	Borehole	Quarterly	NS
GWO 3	-27.88432	29.97457	Located north of the Horn River near borehole GW 12.	Borehole	Quarterly	●
GW 1	-27.89039	29.96292	An artesian borehole located west of the N11 highway, with a constant discharge from the underground workings - decanting into the Horn River.	Borehole	Quarterly	●
GW 2	-27.89372	29.94791	Located close to the western portion of the BLG underground workings; and in close proximity to the Horn River.	Borehole	Quarterly	●
GW 6	-27.87932	29.97158	Located down-gradient of the discard dump and east of the BLG underground workings.	Borehole	Quarterly	●
GW 12	-27.88485	29.97454	Located down-gradient of the discard dump and east of the BLG underground workings.	Borehole	Quarterly	●
GW 13	-27.88481	29.9712	Located down-gradient of the discard dump and east of the BLG underground workings.	Borehole	Quarterly	●
GW 15	-27.8822	29.96828	Located south of borehole GWO and drilled into the BLG underground workings.	Borehole	Quarterly	●
GW 16	-27.88847	29.96682	Located down-gradient of the discard dump and east of the BLG underground workings.	Borehole	Quarterly	●
GW 17	-27.89171	29.96317	Located near the decant (GW 1) from the underground workings.	Borehole	Quarterly	●
UGBH1				Borehole	Quarterly	●
UGBH3				Borehole	Quarterly	NS
UGBH4				Borehole	Quarterly	NS
UGBH5				Borehole	Quarterly	●
NATAL AMMONIA: MOUNT NGWIBI						
Orange Pump	-27.78821	31.07557	Located near the discard dump.	Handpump	Quarterly	Broken
Mnt BH1	-27.78720	31.07995833	Located north east of the discard dump.	Borehole	Quarterly	NS
Mnt BH2	-27.79165	31.07683889	Located south west of the discard dump.	Borehole	Quarterly	NS
Mnt BH3	-27.78905	31.07594444	Located west of the discard dump	Borehole	Quarterly	NS
UMGALA & KNIGHT HILL						
GCSU 1	-27.68209	30.32451	Located near the return water dam of the UMG area.	Borehole	Quarterly	●
GCSU 11	-27.71511	30.29997	Situated downstream of the UMG underground workings.	Borehole	Quarterly	●
GCSU 12	-27.7063	30.35052	Situated near the eastern portion of the UMG underground workings.	Borehole	Quarterly	Dry
UTRECHT						
UT 1	-27.65075	30.31136	Located down-gradient of the old UTR underground workings and up-gradient of the Dorpspruit River.	Borehole	Quarterly	Blocked
UT 5	-27.64484	30.30231	Located down-gradient of the old UTR underground workings.	Borehole	Quarterly	●
ZIMBUTU						
GCSZ 8	-27.71501	30.29421	Located north of Ben's Dam, within the ZIM underground workings.	Borehole	Quarterly	●

● - Sampled NS-Not Sampled

4 RESULTS AND DISCUSSION

In a typical coal environment, pH, electrical conductivity (EC), sulphate (SO₄) and iron (Fe) are the main mine indicator parameters, which are used to determine the degree of impact from the mine as a result of pollution, acidity or alkalinity (INAP, 2017).

- EC indicates the ion content of the water. Coal mining is often associated with high levels of free ions as a result of a high dissolved salt content in the water.
- Sulphate is a main contributor to the salt content due to oxidation of sulphide minerals such as pyrite (FeS₂).
 - The decomposition of pyrite, when exposed to oxygen through mining, creates sulphuric acid and iron. The introduction of water to this process can lead to the formation of sulphuric acid, represented by low pH values if the buffering capacity of the water is low (if low concentrations of calcium and magnesium are naturally present in the host rock).
 - If acidic conditions occur (i.e. low pH) then metals (mainly Fe and Mn) will be mobilised into solution. pH will therefore also be applied as an indicator.

A water quality database for all surface water and groundwater monitoring points has been compiled for all Kangra operations included in the scope of work for this assessment and is updated every month. The surface and groundwater quality data are compared to the mean ambient groundwater and surface water quality, except Ballengeich, where the surface water and groundwater are compared to the Target water Quality Objectives of the Horn and Ngagane Rivers. These limits are used as a means of comparison, but the results should be analysed in the context of the mine and its operations. The water quality limits are provided in **Appendix D** and the hydrochemical results are provided in **Appendix E**.

4.1 Welgedacht Operations

4.1.1 Aasvoëlskrans

This area consists of six (6) surface water points and three (3) groundwater points.

4.1.1.1 Groundwater

Borehole A-BH2 has been blocked since monitoring commenced in July 2018.

- Groundwater levels at A-BH1 remained fairly stable, whilst A-BH3 displayed a decrease during the first quarter. The water levels remained within the historically stable ranges for both boreholes, ranging between 23.2 and 23.72 mbgl; refer to Figure 4-1.

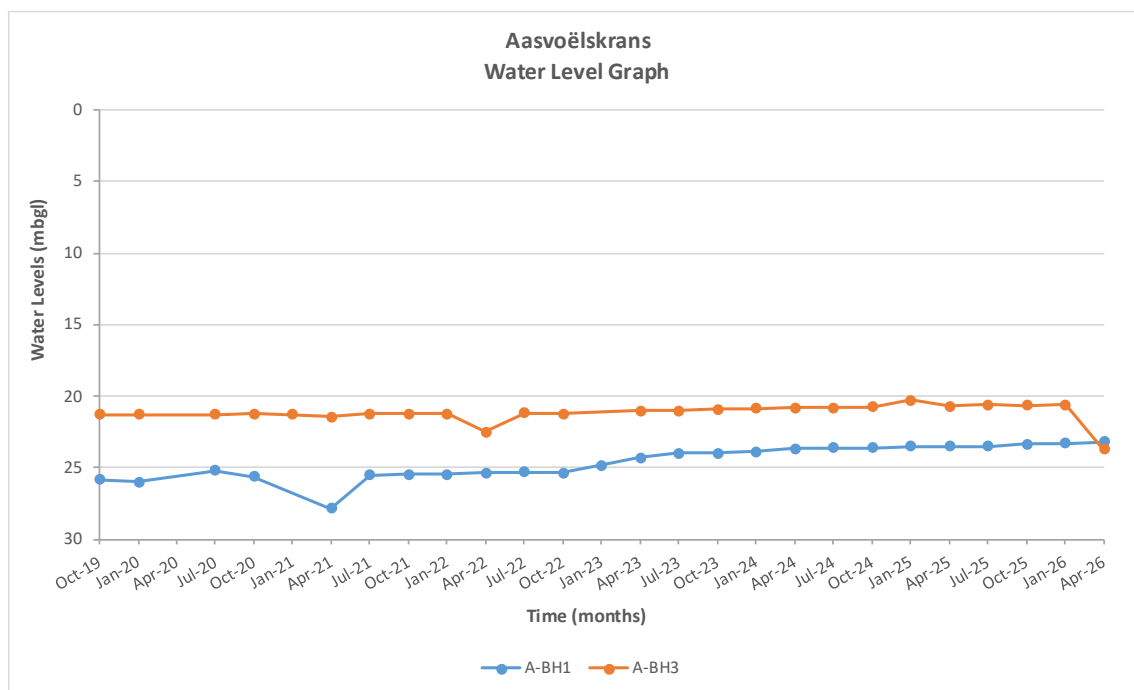


Figure 4-1: Aasvoëlskrans groundwater level graph

The Aasvoëlskrans area is characterised by impacted groundwater quality.

- Neutral pH levels were observed at both points, ranging between 7.0 and 7.1.
 - The pH at borehole A-BH1 displays a cyclical trend. The stable water levels appear to indicate that A-BH1 is drilled into the underground workings. The pH measurements indicate that the workings are currently acidifying with flushing events from other parts of the workings or freshly recharged rainwater in the wet season neutralizing the water within the workings (Figure 4-2).
- EC, TDS, calcium, magnesium, potassium, total alkalinity and sulphate concentrations were above the Mean Ambient Groundwater Quality limits at A-BH3. Additionally, calcium and magnesium were in exceedance at A-BH1, whilst nitrate concentrations were in exceedance at both boreholes, recorded as 0.59 and 0.34 mg/l, respectively.
 - A-BH1 and A-BH3 have displayed fluctuating sulphate concentrations, with A-BH3 (360 mg/l) exceeding the Mean Ambient Groundwater Quality limits in April 2026 (Figure 4-3). The high concentrations are in line with the historical trend data for the site and indicate that the Zone of Impact (ZOI) of the old underground workings has intercepted the Aasvoëlskrans monitoring boreholes, resulting in predominantly acid mine drainage conditions at A-BH1 and saline mine drainage conditions at A-BH3.
- In terms of metal concentrations, manganese (0.10 mg/l) was in exceedance at A-BH3.

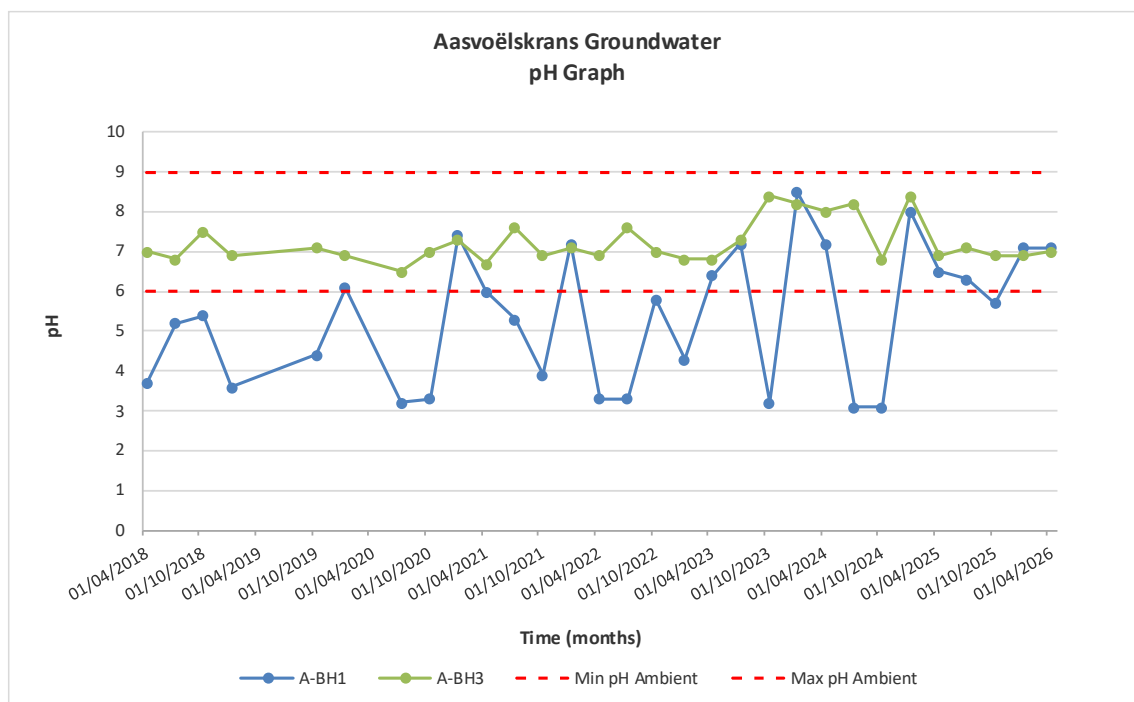


Figure 4-2: Aasvoëlskrans groundwater pH graph

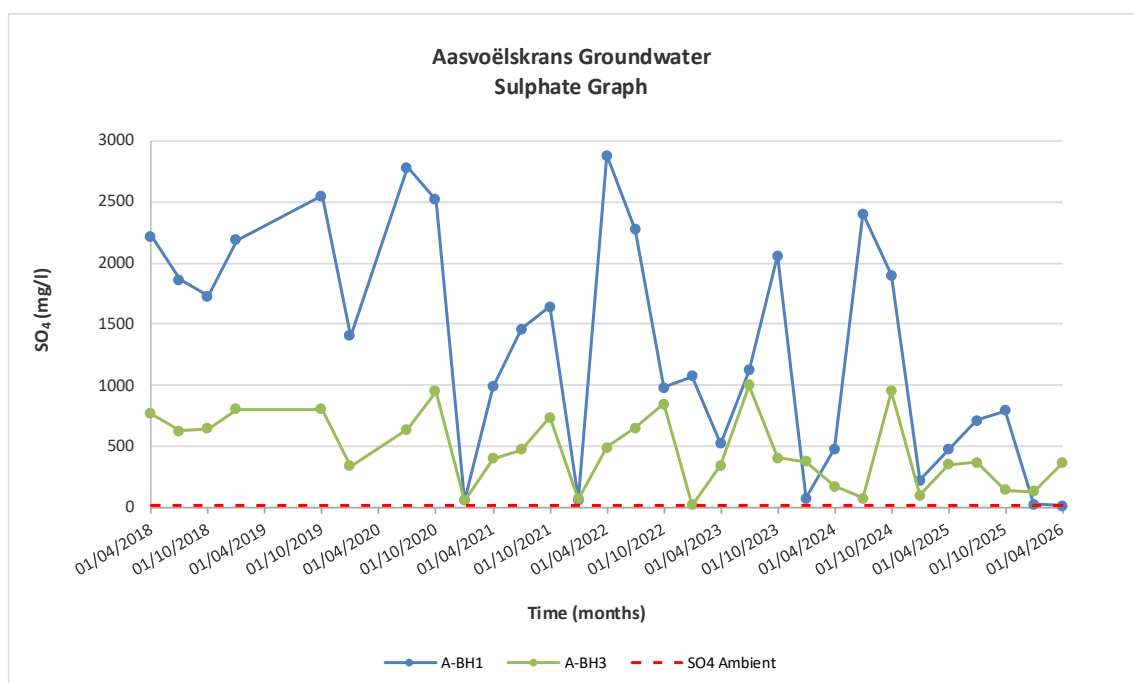


Figure 4-3: Aasvoëlskrans groundwater sulphate graph

4.1.1.2 Surface water

The Aasvoëlskrans surface water points (Upper Dam, Bottom Dam, MM, Boshoffsvlei, VN6 and A-SW1) are characterised by slightly impacted water quality.

- pH levels were neutral to slightly alkaline, ranging between 6.9 and 8.0 (Figure 4-4).

- EC, TDS, calcium, magnesium, sodium, potassium and fluoride concentrations predominantly exceeded the Mean Ambient Surface Water Quality guidelines at all points. However, at the concentrations observed, the impact is considered to be moderately low. Additionally, chloride was in slight exceedance at all points, with the exception of Boshoffsvlei and A-SW1 in April 2026.
- The highest impact was observed at VN6 in April 2026. Upper Dam and A-SW1 display low to medium salts, with TDS concentrations ranging between 130 and 290 mg/l in April 2026, which is likely the source of high salt concentrations at VN6.
- Sulphate was in slight exceedance at all points, with the exception of Upper Dam and MM in April 2026, ranging between 11 and 31 mg/l (Figure 4-5).
- Nitrite concentrations were in slight exceedance of the Mean Ambient Surface Water Quality at Upper Dam in April 2026, recorded as 0.30 mg/l.

The water quality at downstream point Boshoffsvlei, suggests a slight impact from the mine as a result of runoff or baseflow seepage.

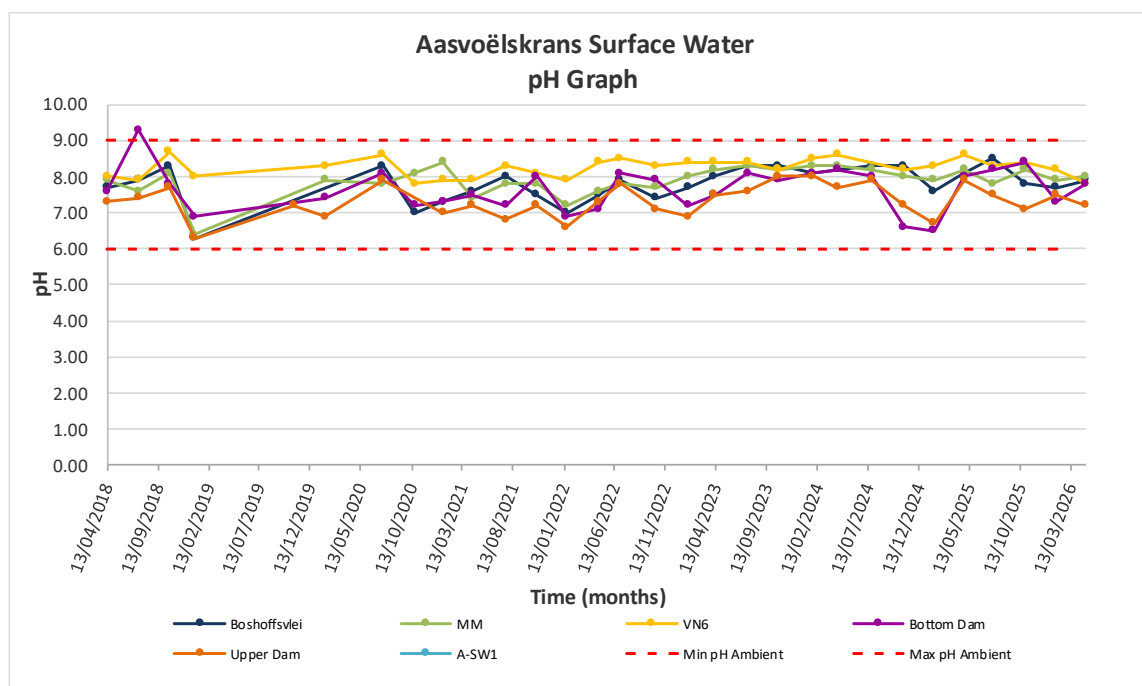


Figure 4-4: Aasvoëlskrans surface water pH graph

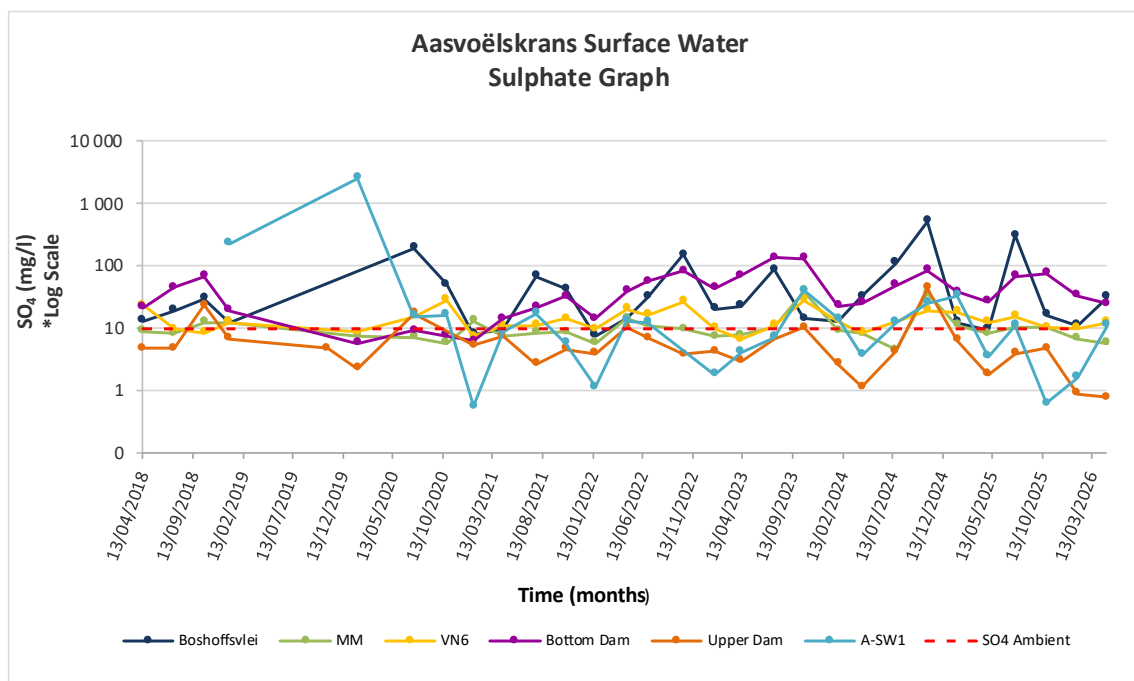


Figure 4-5: Aasvoëlskrans surface water sulphate graph

4.1.2 Umgala

This area consists of three (3) surface water points and six (6) groundwater points.

4.1.2.1 Groundwater

Only boreholes GCSU1 and GCSU11 were sampled during the first quarter; the remaining boreholes were blocked. GCSU12 was dry in April 2026.

- The water levels remained within the stable historical range for these sites, with slight seasonal fluctuations recorded; refer to Figure 4-6.
 - Boreholes GCSU 1 and GCSU 11 indicated shallow groundwater levels, ranging between 1.94 and 1.53 mbgl.
 - An overall increasing trend has been observed at GCSU 12 however, this borehole is often dry.

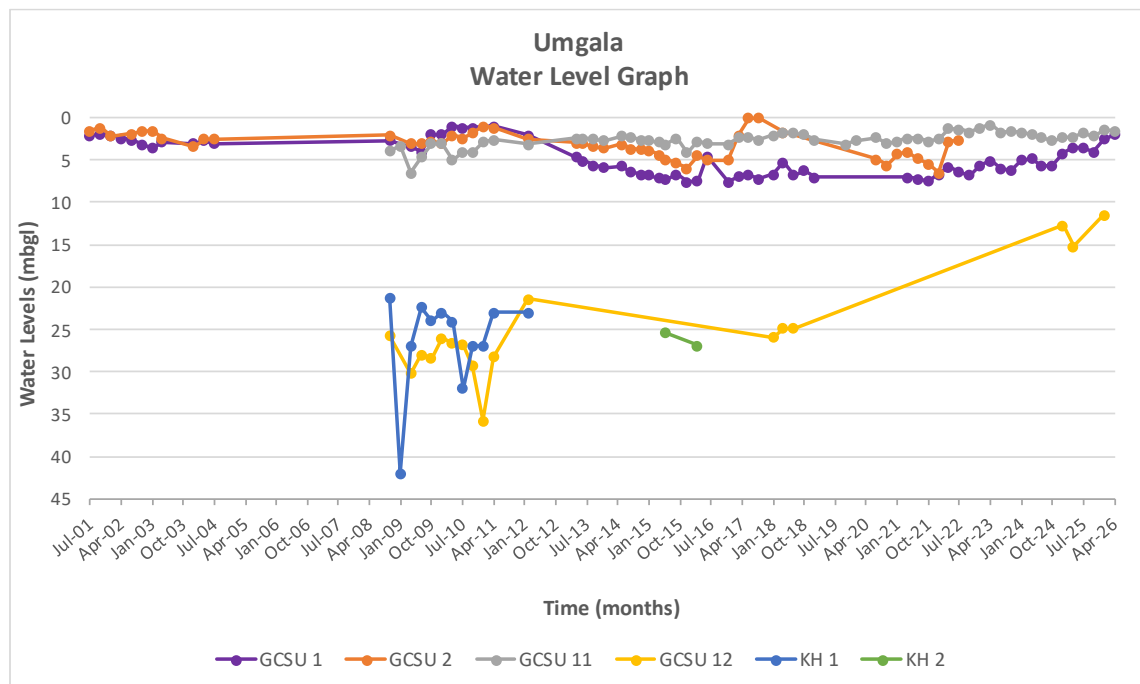


Figure 4-6: Umgala groundwater level graph

Borehole GCSU 1 is located near the return water dam, borehole GCSU 11 is located down-gradient of the underground workings and GCSU 12 is near the eastern portion of the UMG underground workings. GCSU12 was dry in April 2026.

GCSU 1 and GCSU 11 indicated impacted water quality.

- pH levels were indicative of neutral conditions, recorded between 6.7 and 7.8.
- EC, TDS, calcium, magnesium, sodium, potassium and sulphate concentrations exceeded the Mean Ambient Groundwater Quality limits at both points. Additionally, total alkalinity was in exceedance at GCSU1.
 - TDS ranged between 790 and 2 500 mg/l.
 - GCSU 1 displayed a significant increase in sulphate concentrations in July 2023, which has since fluctuated, recorded as 260 mg/l in April 2026. GCSU 1 monitors the return water dam and will be closely monitored going forward. GCSU 11 has displayed consistently high sulphate concentrations, recorded as 1 500 mg/l in April 2026; refer to Figure 4-7. Sulphate at GCSU11 is in line with the historical trend data for the site and indicates that the ZOI of the underground workings has intercepted GCSU 11, resulting in saline mine drainage conditions.
- Nitrate concentrations were in slight exceedance at both points, recorded as 0.19 and 0.13 mg/l, respectively.

- In terms of metals, manganese was in exceedance at both points, recorded as 0.31 and 1.40 mg/l, respectively.

The combination of high salt, sulphate and metal concentrations at GCSU 1 is most likely a result of seepage from the return water dam whilst the water quality at GCSU 11 is likely an impact from the underground workings.

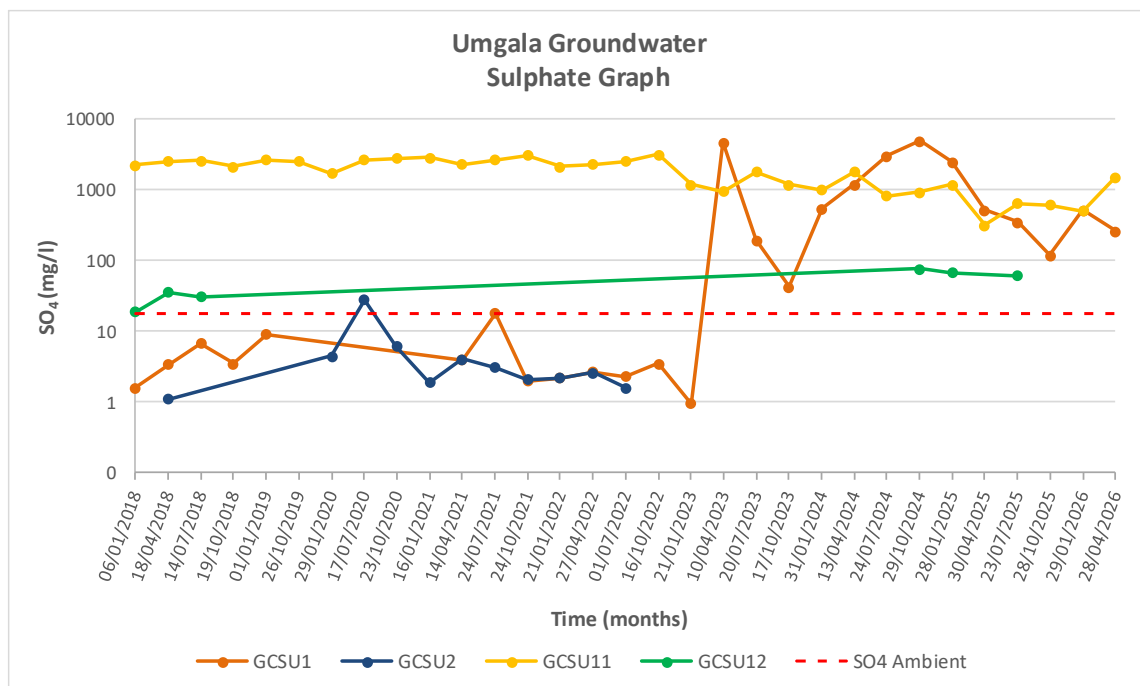


Figure 4-7: Umgala groundwater sulphate graph

4.1.2.2 Surface water

Surface water points RWD, Weir 7B, GCSS2, Mpongosa and RWD Seepage indicated impacted water quality in April 2026.

- pH levels were neutral to slightly alkaline, ranging between 7.9 and 8.1.
- EC, TDS, calcium, magnesium, sodium, potassium, fluoride, chloride and sulphate concentrations predominantly exceeded the Mean Ambient Surface Water Quality guidelines at all points.
 - TDS ranged between 380 mg/l (Mpongosa) and 6 000 mg/l (RWD) in April 2026.
 - The area is characterized by fluctuating sulphate concentrations, which consistently exceed the Mean Ambient Surface Water Quality limit; refer to Figure 4-8. Sulphate ranged between 42 mg/l (Mpongosa) and 3 800 mg/l (RWD Seepage), which is in line with the historical trend data.
- Nitrate concentrations were within the Mean Ambient Surface Water Quality limit during the first quarter.

- In terms of metals, all parameters were within the Mean Ambient Surface Water Quality limit.

RWD is expected to have poor water quality as it monitors the return water dam at the site. Measures should be taken to prevent run-off/seepage of the contaminated water into the surrounding environment. The data indicates that groundwater in the vicinity of borehole GCSU 11 is migrating down-gradient and impacting surface water.

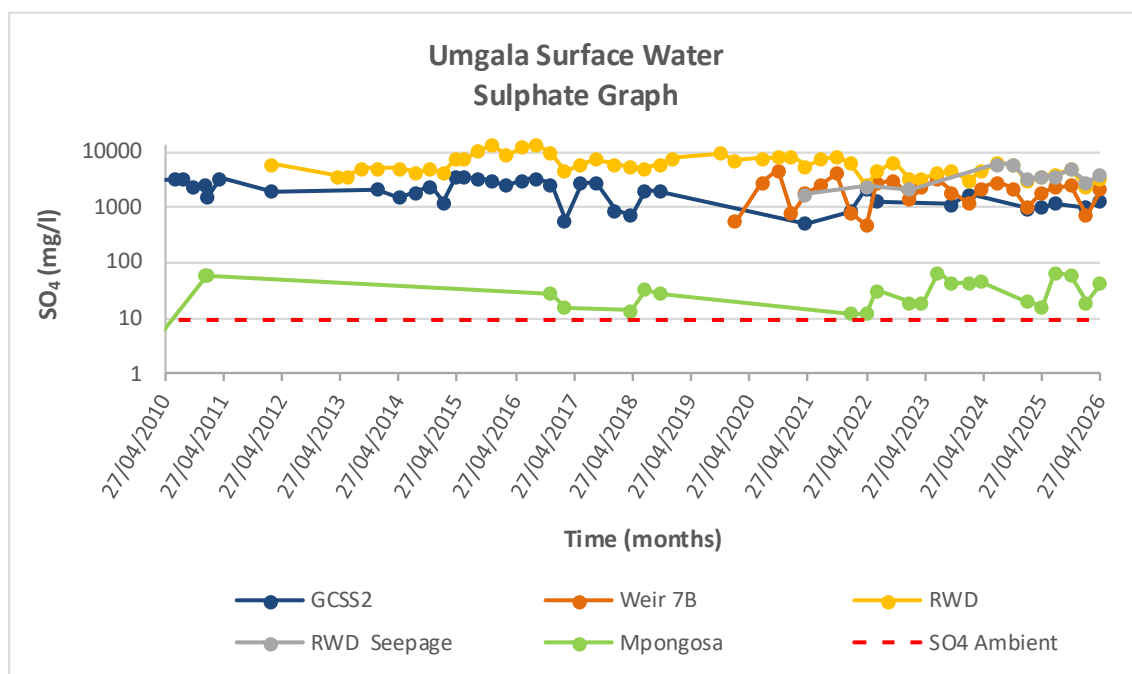


Figure 4-8: Umgala surface water sulphate graph

4.1.3 Utrecht

This area consists of ten (10) surface water points and two (2) groundwater points.

4.1.3.1 Groundwater

Boreholes UT1 and UT5 are located down-gradient of the old Utrecht underground workings. UT1 has been blocked since October 2023.

- The groundwater levels at Utrecht have historically fluctuated, with an overall increasing trend observed over time; refer to Figure 4-9.
- Borehole UT5 indicated a decrease of 0.41 m in water levels, recorded as 1.84 mbgl in April 2026. An overall increasing trend has been observed over time.

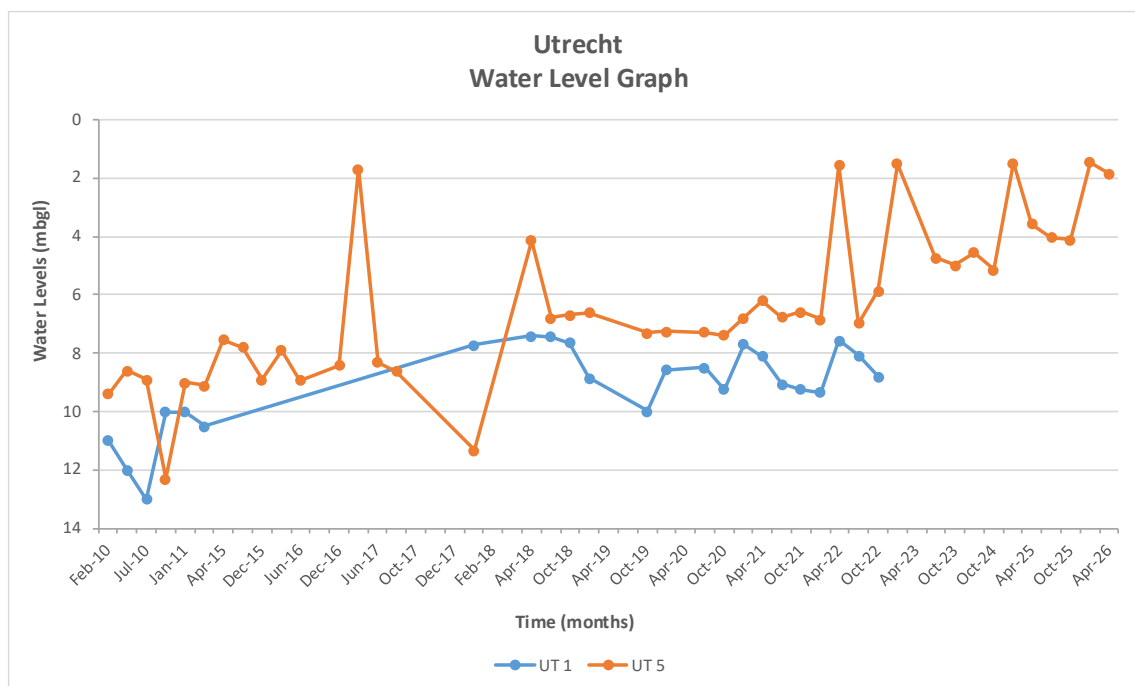


Figure 4-9: Utrecht groundwater level graph

Borehole UT1 was blocked in April 2026. Borehole UT5 was indicative of impacted water quality with several parameters exceeding the Mean Ambient Groundwater Quality guidelines.

- pH levels were neutral at UT5, recorded as 6.6.
- TDS, calcium, magnesium and sulphate concentrations exceeded the Mean Ambient Groundwater Quality guidelines.
 - Sulphate concentrations at UT5 (180 mg/l) were in exceedance in April 2026; refer to Figure 4-10. Sulphate concentrations increased to above the limits at UT5 in March 2017 however, an overall stable trend has been observed since then.
- Nitrate was recorded as 0.20 mg/l.
- In terms of metal concentrations, manganese concentrations were in slight exceedance, recorded as 0.78 mg/l.

The combination of high salt, sulphate and metal concentrations is most likely a result of contamination from the underground workings and discard dump.

- The results indicate that the water quality at UT5 is most likely influenced by the Utrecht underground workings. While the results exceed the ambient groundwater quality, the current concentration observed are considered to be a moderately low risk.

- Historically, the water quality has deteriorated significantly at UT1 over time and is most likely representative of seepage from the discard dump. This borehole is situated near a watercourse and is therefore considered high risk.

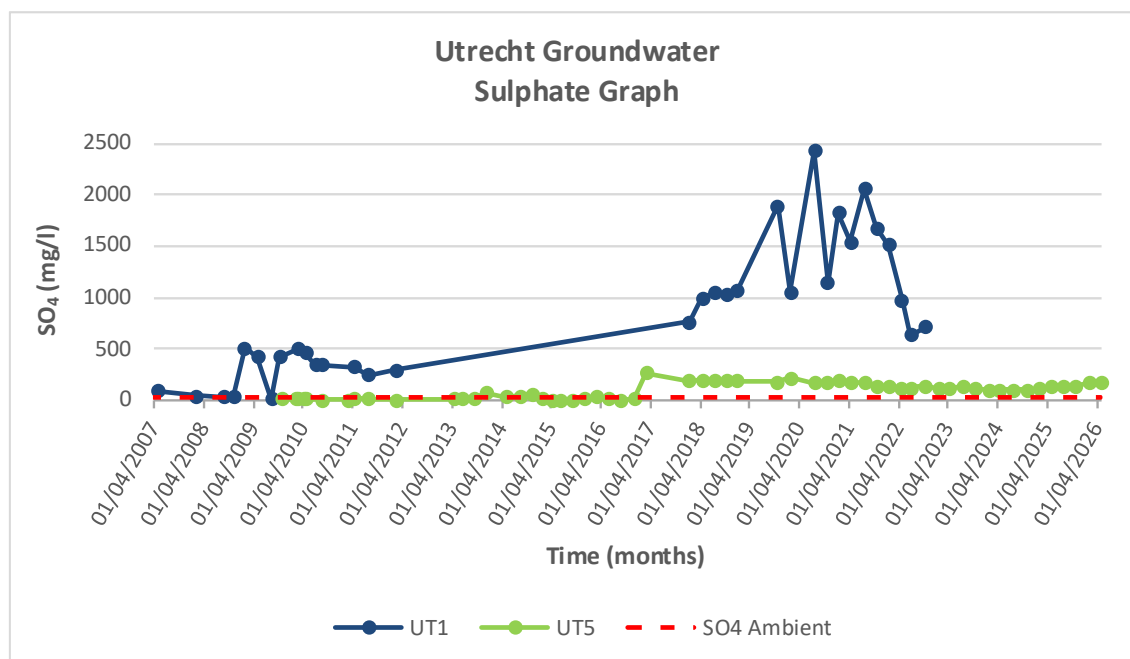


Figure 4-10: Utrecht groundwater sulphate graph

4.1.3.2 Surface water

Surface water point V-Notch 3 had no access in April 2026.

Monitoring points DWD, V-Notch 1, Weir 6A, VN2, VN7, VN31, W1, and W2 indicate impacted water quality. V-Notch 1 and VN2 are decanting from the Utrecht underground workings into the Dorpspruit River.

- pH levels were neutral to slightly alkaline at these points, ranging between 7.5 and 8.6.
- EC, TDS, calcium, magnesium, sodium, potassium, fluoride, chloride and sulphate concentrations predominantly exceeded the Mean Ambient Surface Water Quality limits.
 - Sulphate ranged between 10 mg/l (W1) and 2 400 mg/l (DWD) in April 2026, which is in line with the historical trend data for the site and is indicative of the decant water quality from the Utrecht underground workings, refer to Figure 4-11. DWD indicates a significantly increasing sulphate trend.
- Additionally, nitrates were in slight exceedance at most points, ranging between 0.31 (VN2) and 1.80 mg/l (VN31) in April 2026.
- In terms of metal concentrations, manganese (0.12 mg/l) was in slight exceedance at VN7.

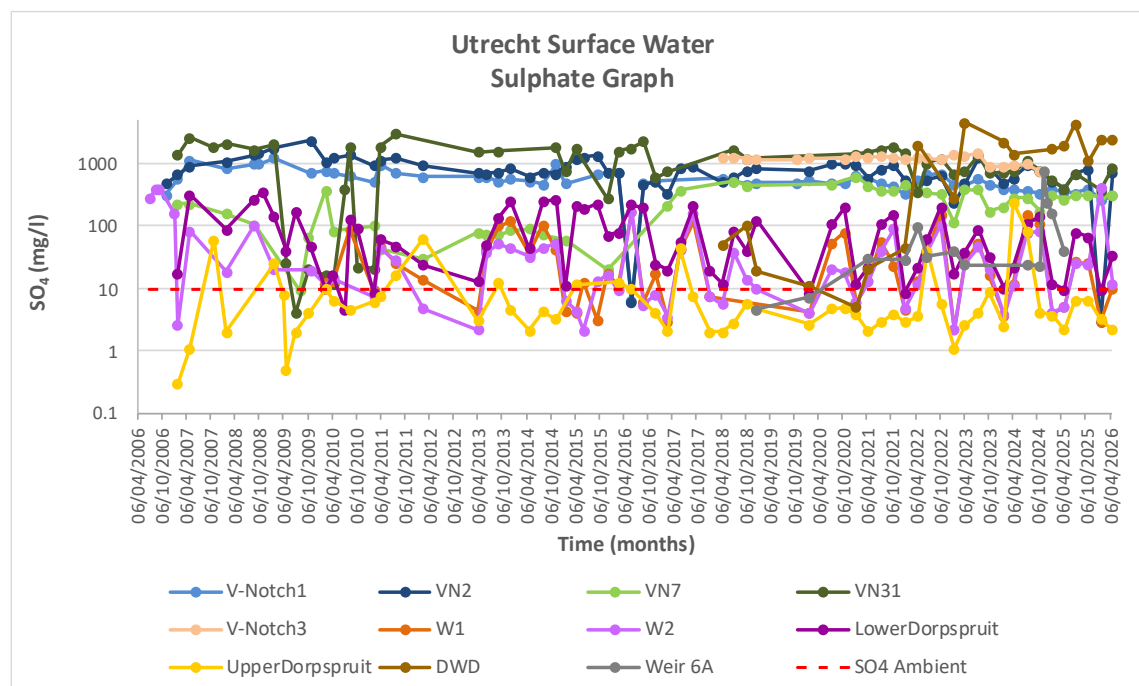


Figure 4-11: Utrecht surface water sulphate graph

Surface water point Upper Dorpspruit indicated slightly impacted water quality in April 2026. The difference in water quality between Upper Dorpspruit and Lower Dorpspruit generally indicates an impact from the site, with TDS concentrations increasing by 200 mg/l at the downstream site in April 2026.

- Neutral pH levels were recorded, ranging between 7.6 and 7.7.
- EC, TDS, calcium, sodium, potassium, chloride, sulphate, flouride and nitrate concentrations exceeded the Mean Ambient Surface Water Quality guidelines at Lower Dorpspruit. Additionally, potassium and nitrate concentrations exceeded the Mean Ambient Surface Water Quality guidelines at Upper Dorpspruit.
 - Sulphate concentrations were in slight exceedance at Lower Dorpspruit (33 mg/l) in April 2026; refer to Figure 4-11.
 - Nitrate concentrations ranged between 0.26 mg/l (Upper Dorpspruit) and 1.5 mg/l (Lower Dorpspruit), exceeding the Mean Ambient Surface Water Quality guidelines.

4.1.4 Zimbutu

This area consists of fourteen (14) surface water points and three (3) groundwater points.

4.1.4.1 Groundwater

Only borehole GCSZ8 was sampled in April 2026; GCSZ2 and GCSZ3 were blocked.

- Water levels indicated a slight increase of 0.55 m at GCSZ8, recorded as 11.8 mbgl in April 2026; refer to Figure 4-12.

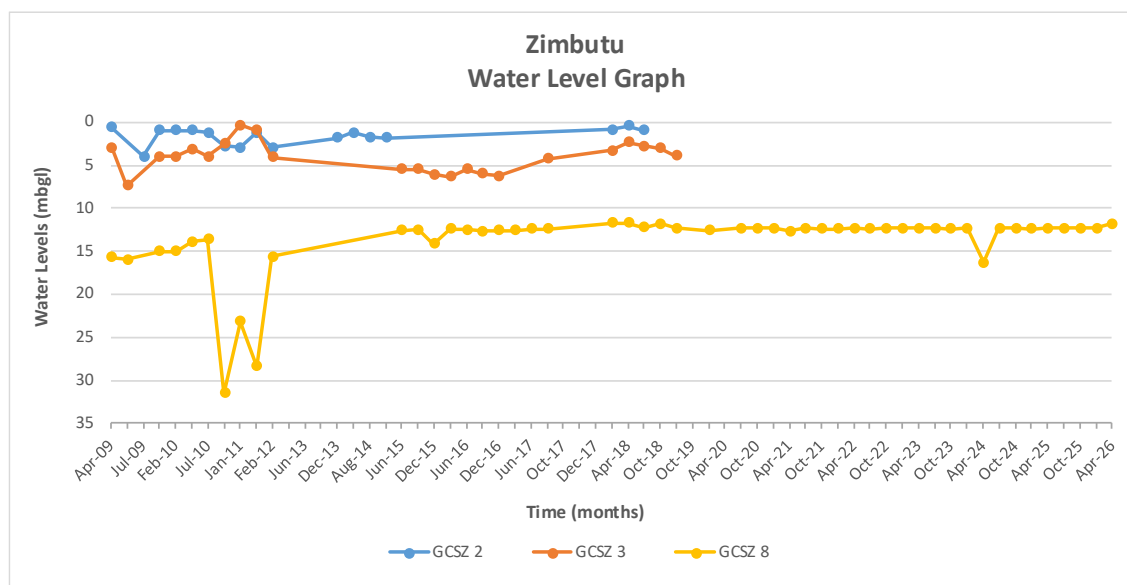


Figure 4-12: Zimbutu groundwater level graph

The hydrochemical results for borehole GCSZ8, located within the underground workings, show a slight impact from the site.

- The pH was recorded as 6.6, indicative of neutral conditions.
- Potassium and chloride concentrations exceeded the Mean Ambient Groundwater Quality limits.
- Nitrate was also in exceedance, recorded as 26.00 mg/l. Nitrate concentrations are typically high at this site and are associated with blasting residues historically used to develop the mine and may indicate potential flooding of the Zimbutu underground workings.
- In terms of metals, aluminium was below the Mean Ambient Groundwater Quality limits at GCSZ8, recorded as 0.10 mg/l.

4.1.4.2 Surface water

All surface water points were sampled during the 2026 first quarter monitoring period.

Surface water points Zim's Decant, Ben's Dam, DWD 2, Buffalo US, Buffalo DS and Buffalo BC are indicative of slightly impacted water quality.

- Neutral pH levels were evident, ranging from 7.0 to 7.6 (Figure 4-13).

- EC, TDS, sodium, potassium, sulphate and fluoride exceeded the Mean Ambient Surface Water Quality guidelines at most points. Additionally, chloride was in exceedance at Buffalo US, Buffalo DS and Buffalo BC. Calcium and magnesium were in exceedance at Zim Decant during the first quarter.
 - Sulphate concentrations slightly exceeded the Mean Ambient Surface Water Quality guidelines, ranging between 19 and 36 mg/l.
- High nitrate and nitrite concentrations were also observed at most points. The highest concentrations were recorded along the Buffels River at surface water points Buffalo US, Buffalo DS and Buffalo BC, ranging between 4.70 and 6.00 mg/l in April 2026. These points are located down-gradient of housing developments which could be contributing to the historically high nitrate and nitrite concentrations.
- In terms of metals, all the parameters were within the Mean Ambient Surface limit.

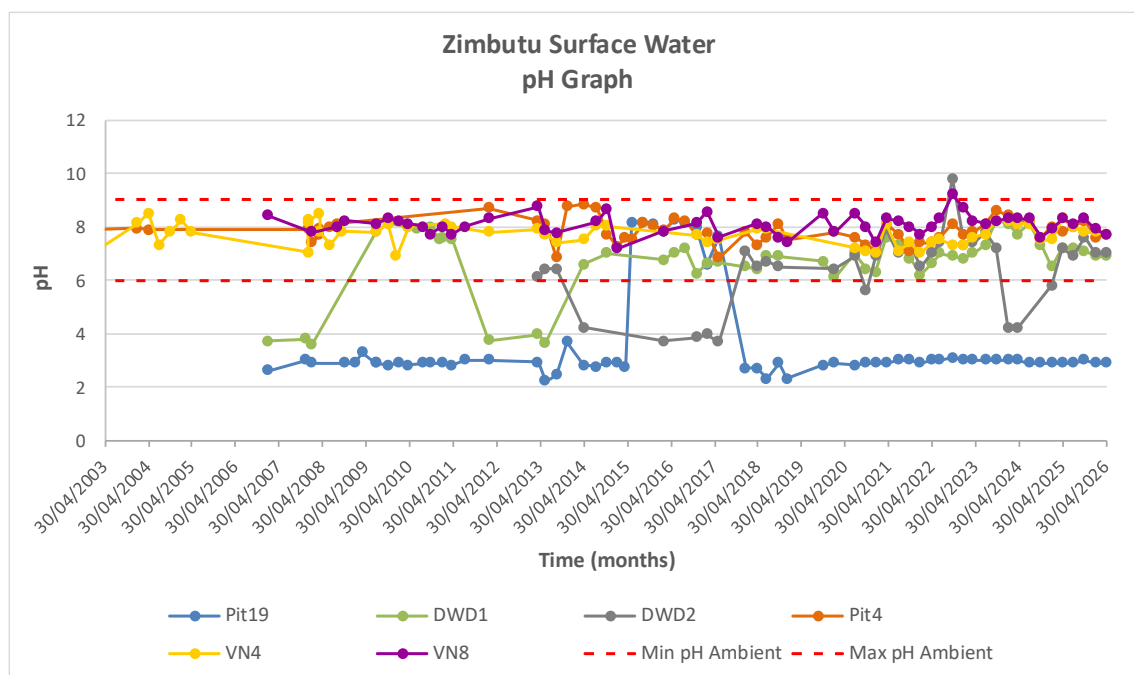


Figure 4-13: Zimbutu surface water pH graph

Surface water points Control Point, Pit 4, Pit 19, VN4, VN8, DWD 1 and Dorp of Buffels displayed impacted water quality.

- Pit 19 displayed acidic pH levels, recorded as 2.9. The remaining points displayed neutral to slightly alkaline pH levels, ranging between 6.9 and 8.2; refer to Figure 4-13.
- EC, TDS, calcium, magnesium, sodium, potassium, sulphate, chloride and fluoride significantly exceeded the Mean Ambient Surface Water Quality limits at all the points.

- High sulphate concentrations were observed at most of the points, both historically and presently, ranging between 74 (Dorp to Buffels) and 7 200 (Pit 19) mg/l in April 2026 (Figure 4-14).
- Nitrate concentrations were in exceedance at Control Point, Pit 19 and Dorp to Buffels, ranging between 0.48 and 1.30 mg/l.
- During the dry months, Pit 19 serves as an evaporation dam. It is used to lower the water table and restrict the outflow, which limits decant and minimizes the impacts on the Buffalo River during low flow. This water must be contained.
- Metal concentrations exceeded the Mean Ambient Groundwater Quality guidelines at several points.
 - Manganese concentrations were in exceedance at Pit 19, DWD1 and VN4 (ranging between 0.22 and 67.0 mg/l).
 - Iron (8.80 mg/l) and aluminum (49.0 mg/l) concentrations were in exceedance at Pit 19.
 - The high metal concentrations observed at Pit 19 were likely a result of the low pH, which mobilized the metals into solution.

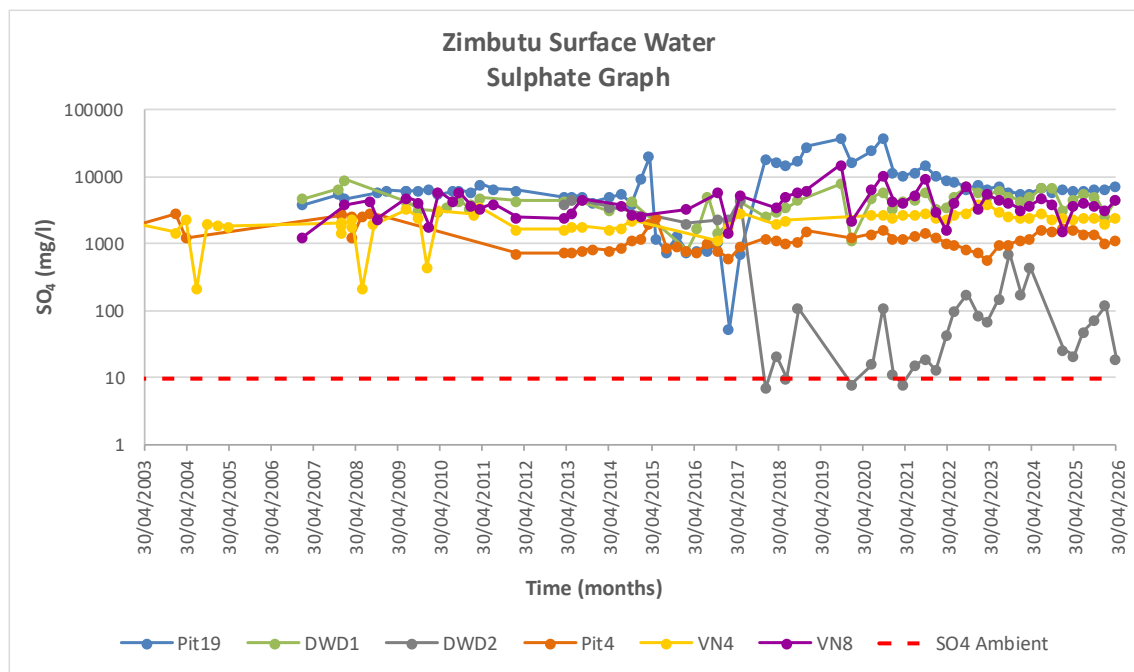


Figure 4-14: Zimbutu surface water sulphate graph

4.2 Natal Cambrian Operations

No reporting is conducted at Smitties Dump as it is not included in the scope of work however, a technical memorandum investigating the contamination of the downstream resource was completed in February 2020 and provided to the client.

4.2.1 Ballengeich

This area consists of twelve (12) surface water points and twelve (12) groundwater points.

Three boreholes (UGBH1, UGBH3 and UGBH5) were added in January 2025. These boreholes were drilled in 2013 and will assist in understanding the water quality at the site. UGBH3 was dry during the first quarter.

4.2.1.1 Groundwater

Shallow groundwater levels (<12.0 mbgl) are observed in the Ballengeich area (Figure 4-15), therefore the boreholes are likely influenced by the upper weathered zone/ weathered aquifer, except GW1.

- Borehole GW1 is an artesian borehole, which constantly discharges groundwater from the Ballengeich underground workings.
- Recent data for the remaining boreholes indicate seasonal fluctuations, with water levels predominantly remaining in their respective historical ranges. Borehole GW6 is characterized by fluctuating water levels.
 - The most significant decrease was observed at GW6 (decrease of 1.23 m) whilst the most significant increase was observed at GW15 (increase of 0.19 m). All other sites displayed a <0.40 m change in April 2026.
 - Water levels at the two new boreholes (UGBH1 and UGBH5) ranged between 8.65 and 19.8 mbgl in April 2026. Future monitoring will confirm the trends.

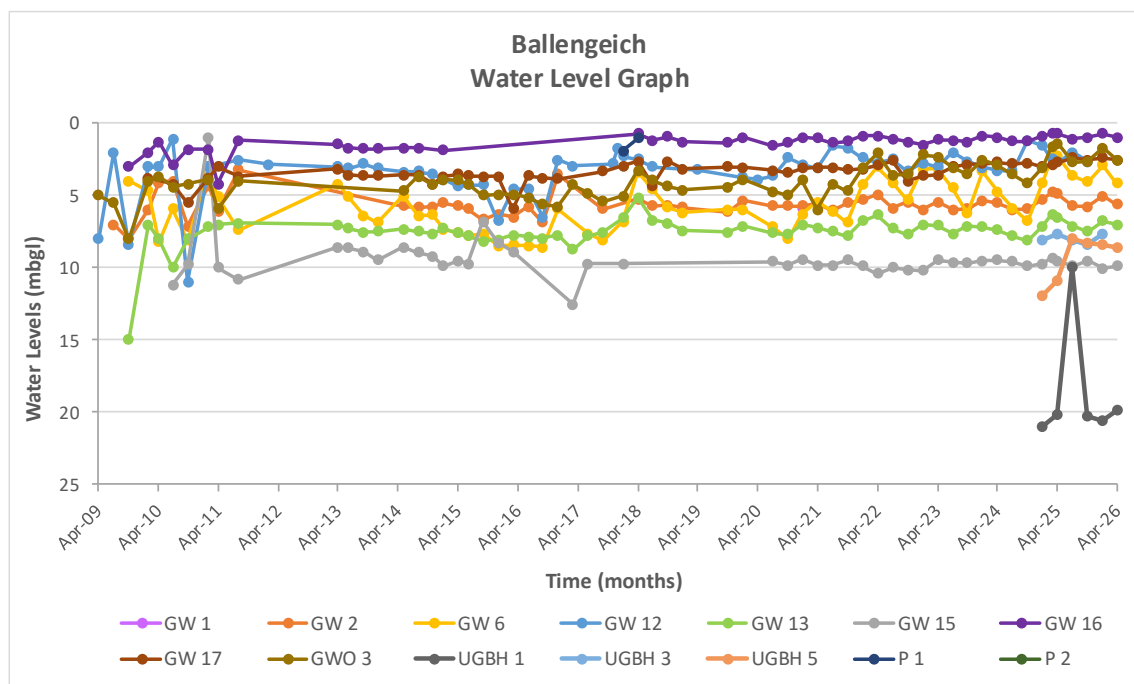


Figure 4-15: Ballengeich groundwater level graph

Boreholes GW2, GW6, GW17 and UGBH5 indicated a slight impact from the site in April 2026.

- pH levels were neutral, ranging between 6.6 and 7.4; refer to Figure 4-16.
- EC, TDS, calcium, magnesium and sulphate concentrations were in exceedance at GW2 in April 2026. TDS and suspended solids (SS) were also in exceedance at GW6. SS was additionally in exceedance at GW17.

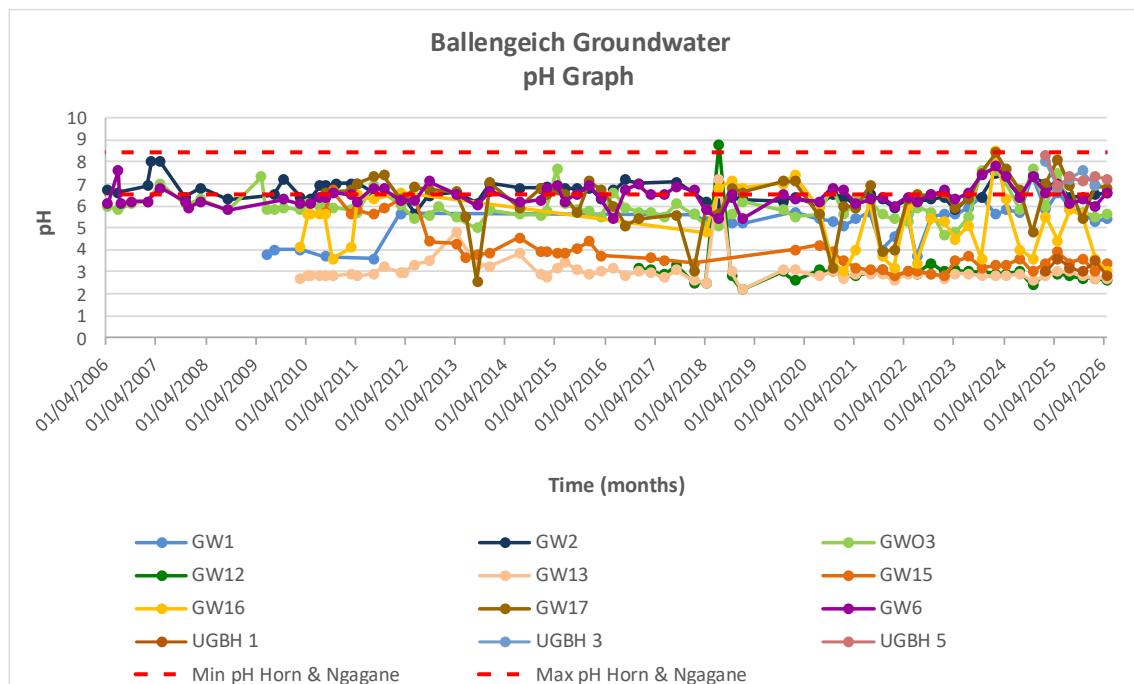


Figure 4-16: Ballengeich groundwater pH graph

The hydrochemical results for boreholes GW1, GW03, GW12, GW13, GW15, GW16 and UGBH1 are indicative of impacted water quality.

- pH levels varied at the site; refer to Figure 4-16.
 - Acidic to slightly acidic pH was recorded at GW1, GW03, GW12, GW13, GW15, GW16, GW17 and UGBH1, ranging between 2.6 and 5.6.
- EC, TDS, calcium, magnesium and sulphate concentrations significantly exceeded the Horn and Ngagane Quality Objectives at all boreholes. Sodium, chloride, fluoride, ammonia and SS were also high at several points.
 - Historically, GW03 has displayed relatively stable sulphate concentrations, which are high above the Horn and Ngagane Quality limit but are <700 mg/l. Sulphate was recorded as 690 mg/l in April 2026.
 - The remaining six boreholes are characterized by fluctuating sulphate trends. These seven boreholes displayed significantly high sulphate concentrations, which exceeded the stipulated objective, ranging between 2 000 mg/l (at UGBH1) and 5 900 mg/l (at GW13) in April 2026; refer to Figure 4-17. The results indicate acid mine drainage conditions, with GW03 likely located at the edge of the ZOI.
- Metal concentrations (aluminium, iron and manganese) were high at several points however, there are no specified limits for these in the Horn and Ngagane limits.

- The impacted water quality at GW1 is likely a result of discharge from the underground workings whilst GW12, GW13, GW15, GW16 and GW17 have likely been impacted by cumulative seepage from underground workings, opencast workings, discard dump and PCD.

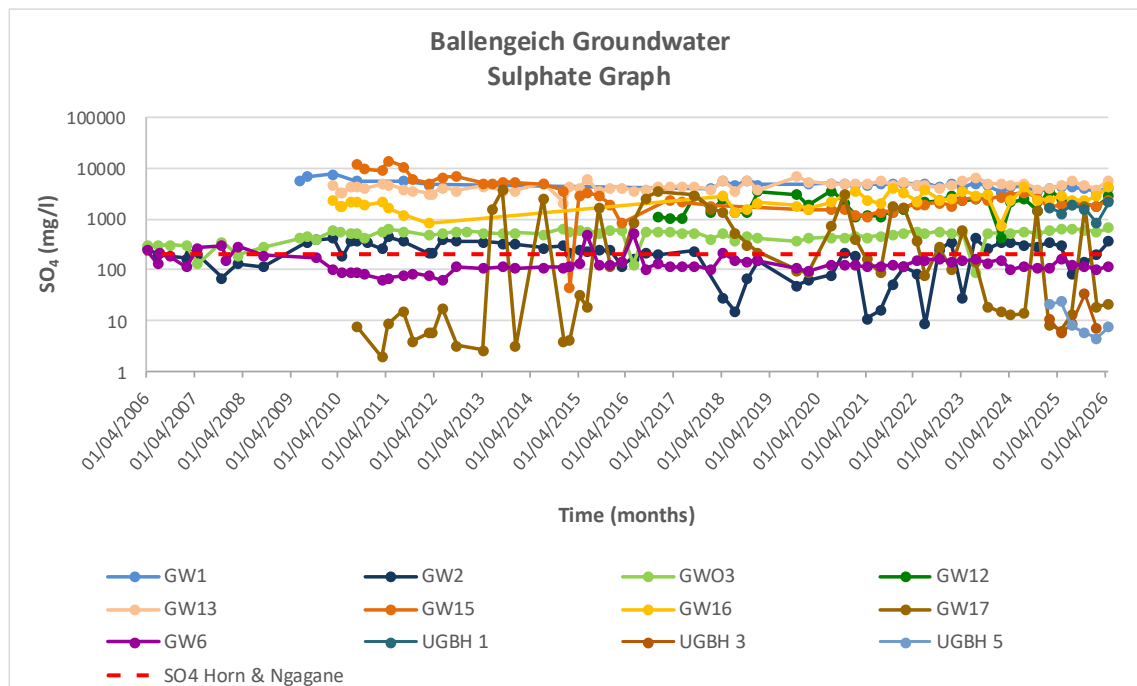


Figure 4-17: Ballengeich groundwater sulphate graph

4.2.1.2 Drinking Water

Drinking water does not form part of the Water Use License but is included in the monitoring as part of Kangra's own internal health and safety requirements. The water quality is compared to the 1996 DWAF SAWQTV for Domestic Use and the SANS 241-1:2025.

The following was observed during the first quarter of 2026 at the drinking water site GWO:

- The pH level was neutral at 7.4.
- EC, TDS, calcium, sodium and fluoride concentrations continued to exceed the DWAF Domestic Use limits in April 2026 but remained below the SANS guidelines.
 - TDS ranging between 450 to 1 000 mg/l and EC ranging between 70 to 150 mS/m, may result in water with a noticeable salty taste, but is well tolerated. No effects on plumbing or appliances are expected (DWAF, 1996).
 - Calcium concentrations ranging between 32 and 80 mg/l have no health effects. Increased scaling problems and lathering of soap impaired expected (DWAF, 1996).

- Sodium concentrations between 100 and 200 mg/l results in a faintly salty taste, but no health effects expected (DWAF, 1996).
- Fluoride concentrations between 1.0 and 1.5 mg/l may result in slight mottling of dental enamel to occur in sensitive individuals, no other health effects are expected (DWAF, 1996).
- Manganese concentrations between 0.05 and 0.10 mg/l are within a tolerable range, although slight straining may occur. No health effects are expected (DWAF, 1996).

4.2.1.3 Surface water

Five surface water points (SW1, SW4, SW6, SW9 and SW10) are monitored every month whilst the remaining surface water points (SW 2, SW 3, SW 3(1), SW 5, VN 11, VN 3 and SW 7) are monitored quarterly. Two new points, namely Ingagane US and Ingagane DS, were added to the monitoring network in March 2022 to better monitor the Ngagane River. An additional point was added to the monitoring network in July 2022, namely VN5. SW3 was dry in April 2026.

The hydrochemical results for the seven monthly surface water points indicated varying water quality in the first quarter of 2026, with the greatest impact observed at SW4, SW6, SW9, SW10 and Ingagane DS.

- Neutral pH levels were recorded, ranging between 7.1 and 7.7.
- TDS, SS and ammonia were intermittently in exceedance of the Horn and Ngagane Quality Objectives at most points during the first quarter.

The water quality at SW4 and SW6 indicates an impact on the Horn River whilst Ingagane DS indicates an impact on the Ngagane River.

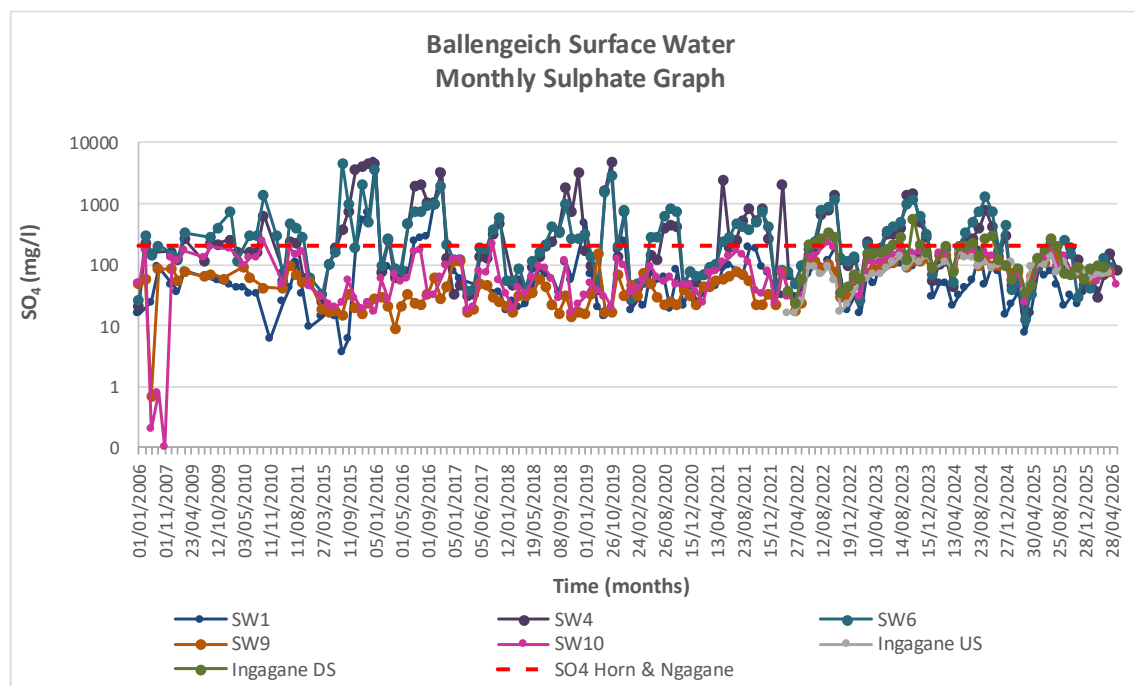


Figure 4-18: Ballengeich surface water sulphate graph for the monthly monitoring points

The hydrochemical results for the quarterly surface water points indicated varying water quality.

- Surface water points SW2, VN5 and VN11 indicated acceptable water quality in April 2026.
 - Neutral pH conditions were recorded, ranging between 6.8 and 7.5, refer to Figure 4-19.
 - All other parameter concentrations were low.
- Surface water points SW3(1), SW5, SW7 and VN3 indicated impacted water quality.
 - Acidic pH was recorded at SW3(1), SW5 and SW7, ranging between 2.3 and 2.6, whilst neutral pH was recorded at VN3, recorded as 6.8.
 - EC, TDS, calcium, magnesium, sodium, and sulphate values consistently exceeded the Horn and Ngagane Quality Objectives at all points during the first quarter. Additionally, chloride was in exceedance at VN3, whilst fluoride was in exceedance at SW3(1).
 - Surface water points SW3, SW3(1), SW5, SW7, VN3 and VN5 are characterized by fluctuating sulphate concentrations, which consistently exceed the Horn and Ngagane Quality Objectives, ranging between 2 800 and 7 500 mg/l in April 2026. The data indicates acid mine drainage conditions; refer to Figure 4-20.

- Ammonia concentrations were also consistently in exceedance at all points (ranging between 0.88 and 8.5 mg/l).
- Metal concentrations (aluminium, iron and manganese) were high at several points, particularly SW3(1), SW5 and SW7, however, there are no specified limits for these in the Horn and Ngagane quality objectives.
- The trend data for VN11 and SW2 indicates a slight impact on the water quality in the vicinity of the western old opencast mine.
- SW3(1) and SW7 monitor PCDs and are therefore expected to have poor water quality. The dams should be lined to create a closed system and prevent seepage of the contaminated water into the environment.
- The water quality at VN3 is likely influenced by decant from the underground workings.

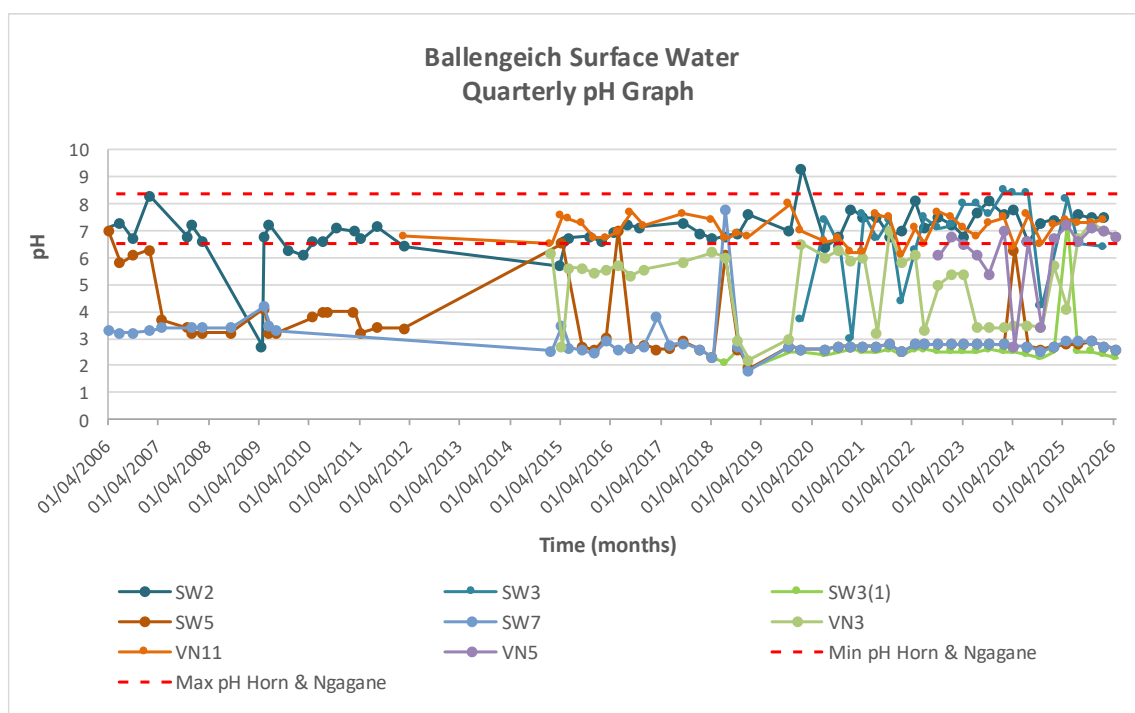


Figure 4-19: Ballengeich surface water pH graph for the quarterly monitoring points

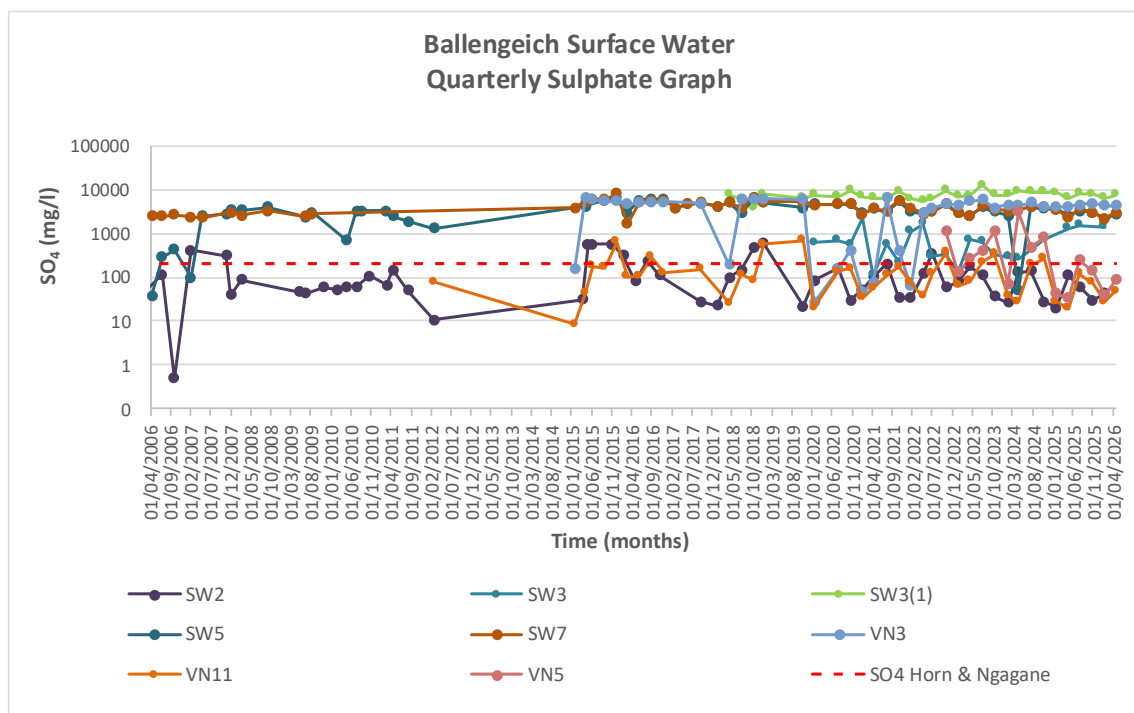


Figure 4-20: Ballengeich surface water sulphate graph for the quarterly monitoring points

4.3 Longridge

This area consists of seven (7) surface water points.

4.3.1 Groundwater

There are no groundwater monitoring points for the Longridge area.

4.3.2 Surface water

The hydrochemical results for LRVN1, LRVN2, LRVN4, LRVN8 and LRVN9 are indicative of acceptable to slightly impacted water quality, showing no significant impact from the mine. LRVN1 was dry in April 2026.

- The pH levels were neutral to slightly alkaline, ranging between 7.3 and 8.1.
- EC, TDS, calcium and sulphate were in exceedance of the WQO's at LRVN3. Calcium was additionally in exceedance at LRVN2 and LRVN8, whilst sodium was in exceedance at LRVN4 and LRVN9. Additionally, fluoride was in exceedance at LRVN4.
- Sulphate concentrations were in exceedance at LRVN2 recorded as 250 mg/l; refer to Figure 4-22.
- In terms of metals, manganese was in exceedance at LRVN4, recorded as 0.08 mg/l.

The hydrochemical results for LRVN5, LRVN6 and LRVN7 are indicative of impacted water quality.

- pH levels were neutral to slightly alkaline, ranging between 7.3 and 8.0.

- EC, TDS, calcium and sulphate concentrations were in exceedance at all points, magnesium concentrations were in exceedance of the DWAF SAWQTV Drinking Water guidelines at LRVN5 and LRVN7. Additionally, sodium exceeded the DWAF SAWQTV Drinking Water guidelines at LRVN5.
- Sulphate concentrations exceeded the DWAF SAWQTV Domestic Use guidelines at all three points, with LRVN5 generally exhibiting the highest concentrations. Concentrations ranged between 400 mg/l (at LRVN6) and 1 000 mg/l (at LRVN5) in April 2026, with LRVN5 exhibiting an overall increasing trend; refer to Figure 4-22.
- In terms of metal concentrations, manganese was in exceedance at LRVN6 and LRVN7, ranging between 0.07 and 0.35 mg/l, exceeding the DWAF SAWQTV Domestic Use guidelines.

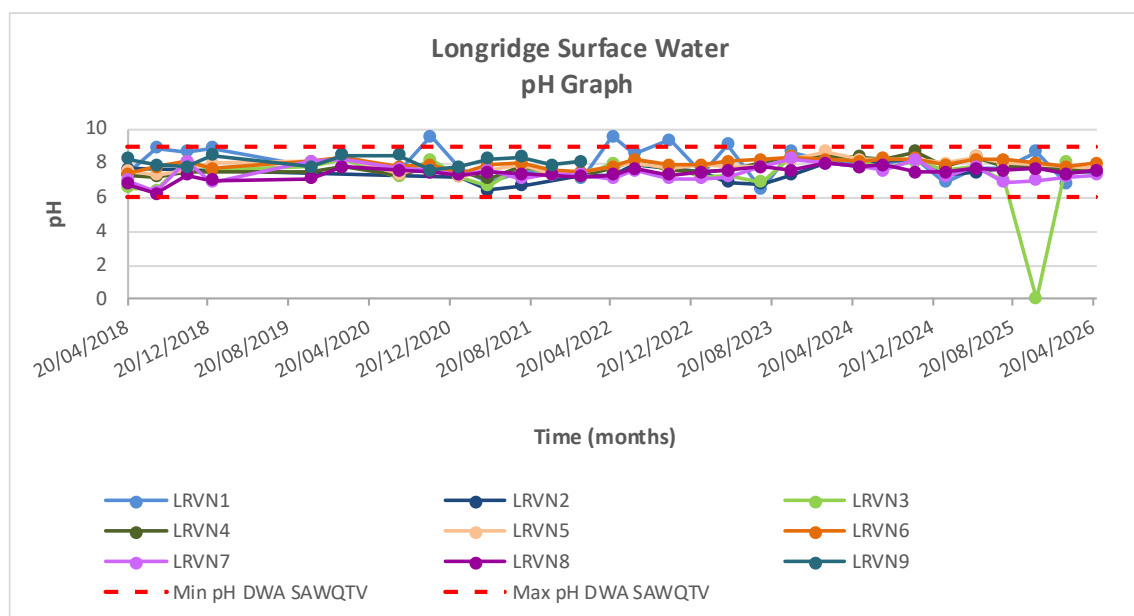


Figure 4-21: Longridge surface water pH graph

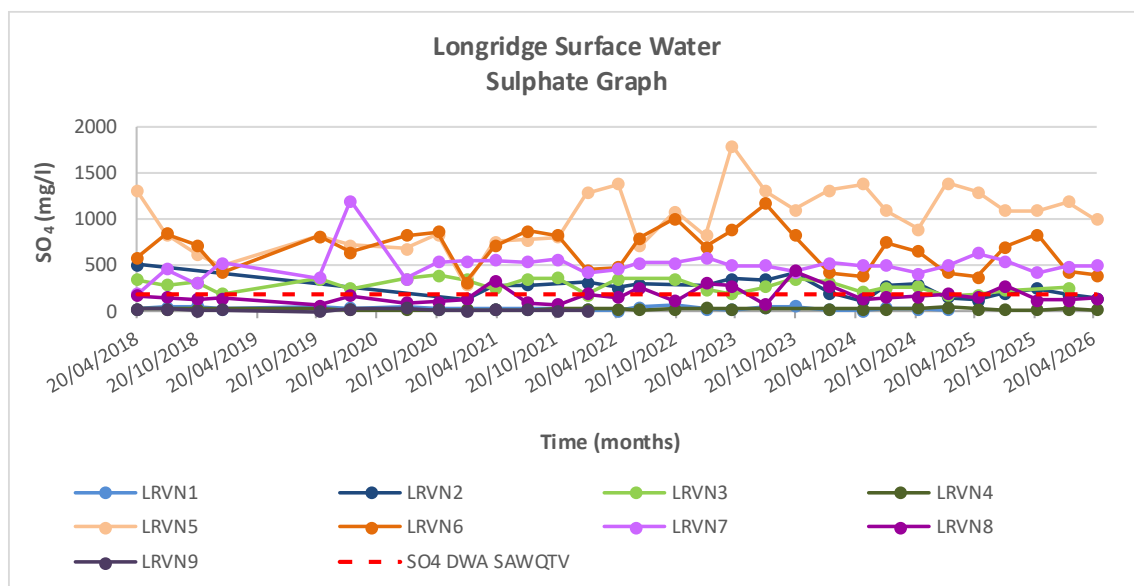


Figure 4-22: Longridge surface water sulphate graph

4.4 Natal Ammonia

This area consists of five (5) surface water points and one (4) groundwater points.

4.4.1 Groundwater

Three boreholes (Mnt BH1, Mnt BH2 and Mnt BH3) were drilled in November 2023 and monitoring was conducted from January 2024. Orange Pump was not sampled as the hand pump was broken. Borehole Mnt BH1, Mnt BH2 and Mnt BH3 were not sampled due to no access in April 2026.

4.4.2 Surface Water

Surface water point West of Dump Stream was added to the monitoring network in May 2021 to better discern the decant water quality from the discard dump. Four new sampling points (Mnt VN1, Mnt VN2, Mnt VN3 and Mnt VN4) were added in the second quarter of 2024. Surface water points VN Waterfall, West of Dump Stream, Mnt VN1, Mnt VN2, Mnt VN3 and Mnt VN4 had no access.

The hydrochemical results for Alpha, House VN, Pump VN and Nongoma are indicative of slightly impacted water quality.

- The pH levels were neutral to slightly alkaline, ranging between 7.8 and 8.3.
- Calcium concentrations exceeded the DWAF SAWQTV Drinking Water limit at all points, whilst TDS and sulphate were in exceedance at House VN and Pump VN.
 - Sulphate exceeded the DWAF SAWQTV Drinking Water limit at House VN and Pump VN, recorded as 240 mg/l at both points in April 2026 (Figure 4-24). Most sites have displayed a stable trend, with slightly fluctuating sulphate observed over time.

- In terms of metals, all parameters were within the DWAF SAWQTV Drinking Water limit.

The impacted water quality at House VN is likely due to decant from the old Natal Ammonia underground workings whilst the impacted water quality at VN Waterfall is likely due to decant from the discard dump, located upgradient of the sampling point, and potentially the underground workings however, the decant from the adit needs to be sampled to confirm this.

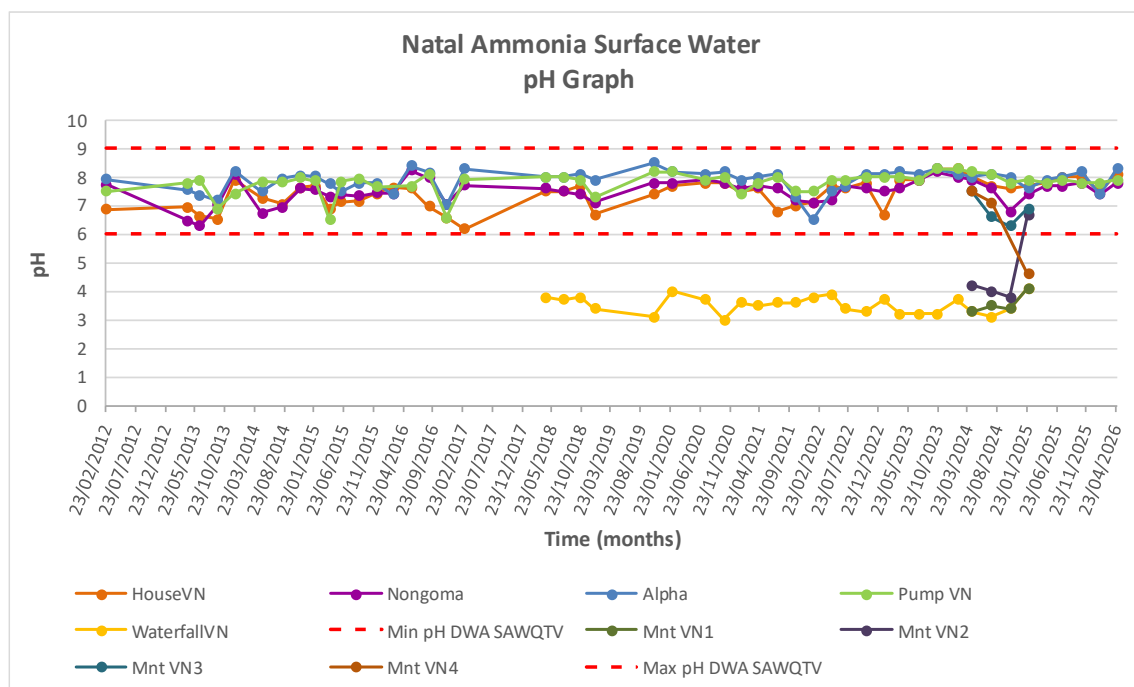


Figure 4-23: Natal Ammonia surface water pH graph

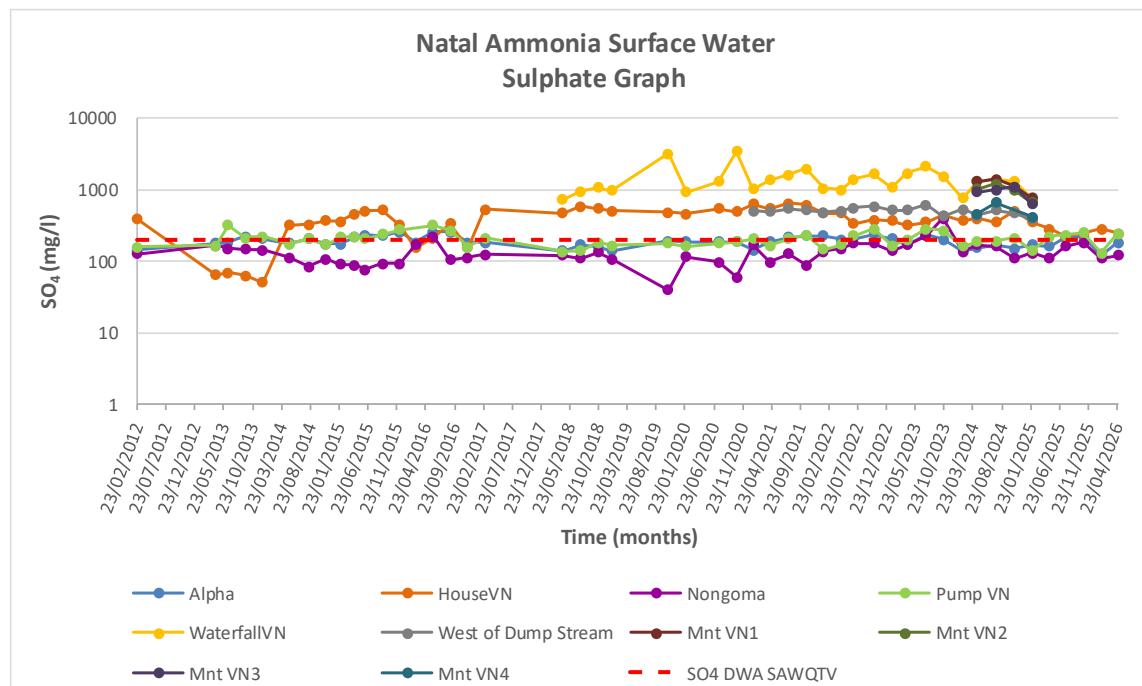


Figure 4-24: Natal ammonia surface water sulphate graph

4.5 Surface Water Flow

Triangular weirs (v-notch weirs) are typically installed in open channels such as streams to determine discharge (flow rate). The basic principle is that discharge is directly related to the water depth above the crotch (bottom) of the V; this distance is called head (h). The V-notch design causes small changes in discharge to have a large change in depth, resulting in more accurate head measurements than with a rectangular weir.

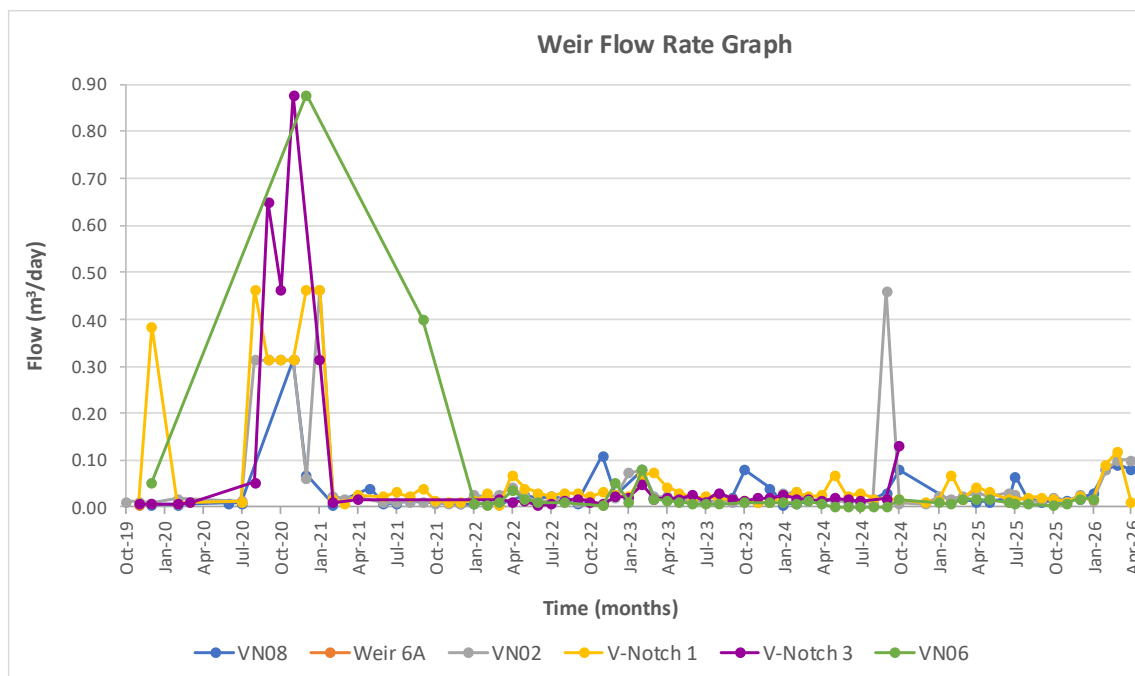
The flow in the Welgedacht area is monitored at six v-notch weirs using manual readings monthly. The manual readings are converted into volumetric flow (m^3/day), by substituting the depth values into the Kindsvater-Shen equation (USBR, 1997); refer to **Appendix A**. The weir data available can be used to model flows along the river systems.

Flow rates measured at VN08, VN02, V-Notch 1, V-Notch 3 and VN06 in the first quarter are provided in Table 4-1. The flow rates at all five weirs are consistently low as the region typically receives low rainfall volumes which results in subsequent small head measurements.

- The flow rates were low at all points ($<0.083 \text{ m}^3/\text{day}$) in the first quarter; refer to Figure 4-25.
 - The trend data illustrates stable trends at most sites since February 2021, except VN06. The flow rates at VN06 have stabilised since January 2022.
 - Seasonal fluctuations were observed in the first quarter, with V-Notch 3 displaying the most significant change in March 2026.

Table 4-1: Flow rate at the measured V Notches

Site	Site ID	Flow (m ³ /day)		
		Feb-26	Mar-26	Apr-26
ZIMBUTU	VN08	0.008	0.009	0.08
UTRECHT	Weir 6A	Water is flowing around V Notch		
	VN02	0.008	0.1	0.1
	V-Notch 1	0.09	0.12	0.01
	V-Notch 3	No Access		
AASVOËLSKRANS	VN06	No flow	No flow	No flow

**Figure 4-25: Surface water flow rate graph for the Welgedacht area**

5 CONCLUSIONS

Summary of the 2026 first quarter report findings:

The available monitoring results have confirmed that impacted mine water is decanting into the environment and the full extent of the impact downgradient from each operation has not been sufficiently delineated within all catchments. Additionally, the full impact on the underlying groundwater has not been fully delineated and requires additional monitoring points to assess the full extent.

Welgedacht Operations:

Groundwater Levels:

The groundwater levels in the Welgedacht area remained fairly stable in the first quarter, showing a change of <0.80 m.

Water Quality:

- The mining operations in the Welgedacht area are all non-operational mines and the impact is associated with existing infrastructure, such as discard dumps, as well as old underground working. Mine water decant from the mined-out underground workings have been observed to impact the surface and groundwater environments.
 - Of the mining operations in the Welgedacht area, Aasvoëlkrans poses the highest known risk to the groundwater environment due to acid mine drainage conditions observed on site, specifically at borehole A-BH1, associated with seepage from the underground workings. Saline mine drainage conditions are consistently observed at Umgala, Utrecht and Zimbutu.
 - Mine water decant from all sites significantly impact the surface water environment; the most significant impact has been observed at Zimbutu at Pit 19 which has consistently displayed acid mine drainage conditions.
 - The current extent of the monitoring network is considered to be insufficient to capture potentially impacted areas at several of these sites.

Natal Cambrian Operations:

Groundwater Levels:

- Water levels changed by <0.38 m at most all sites in the first quarter. Borehole GW1 is an artesian borehole, which constantly discharging contaminated groundwater (decanting AMD) from the Ballengeich underground workings. The most significant fluctuations were observed at GW6, both historically and presently.

Water Quality:

- Several monitoring points at this site display impacted water quality as a result of seepage or decant from the underground workings, opencast workings, discard dump and/or PCDs. The data shows a high risk to both the surface water and groundwater environment from the Ballengeich operations.
 - Drinking water borehole GWO, which lies within the mine boundary, indicated that predominantly all measured parameters were below the SANS guideline values in April 2026. TDS ranging between 450 to 1 000 mg/l and EC ranging between 70 to 150 mS/m, may result in water with a noticeable salty taste, but is well tolerated. No effects on plumbing or appliances are expected (DWAF, 1996).
 - Calcium concentrations ranging between 32 and 80 mg/l have no health effects. Increased scaling problems and lathering of soap impaired expected (DWAF, 1996).
 - Sodium concentrations between 100 and 200 mg/l results in a faintly salty taste, but no health effects expected (DWAF, 1996).
 - Fluoride concentrations between 1.0 and 1.5 mg/l may result in slight mottling of dental enamel to occur in sensitive individuals, no other health effects are expected (DWAF, 1996).
 - Manganese concentrations between 0.05 and 0.10 mg/l are within a tolerable range, although slight straining may occur. No health effects are expected (DWAF, 1996).

Longridge Operations:**Water Quality:**

- There is no groundwater monitoring network at the Longridge site, resulting in a significant data gap.
- The main source of concern at Longridge is the discard dump. The impact of decant from the rehabilitated discard dump is evident at sample points LRVN5, LRVN6 and LRVN7. Additional points are required to determine the extent of the impact.

Natal Ammonia Operations:**Water Quality:**

- Groundwater data from the newly drilled boreholes around the discard dump (Mnt BH2 and Mnt BH3) indicate an impact on water quality. Future data will confirm the trends.

- Similar to Longridge, the main source of concern at Natal Ammonia is the rehabilitated discard dump. Decant from the discard dump has resulted in acidic pH and high sulphate and metal concentrations, which indicate acid mine drainage.
 - There is a plan in place to remove the discard dump and use a passive treatment option to treat the water, most likely an artificial wetland.

5.1 Recommendations

Any future mining activities should consider the amendment to the current monitoring program to include any sources, pathways and receptors potentially impacted by such activities.

A full audit of the monitoring programme was completed in September 2022, which addressed all information gaps in the monitoring network. The following additional monitoring is recommended, based on the current network:

- It is recommended that boreholes GCSZ2, GCSZ3 (Zimbutu) and Orange Pump (Natal Ammonia) be re-established.
- Four boreholes were drilled in the Ballengeich area in 2013 (UGBH 1, UGBH 3, UGBH 4 and UGBH 5); refer to the Ballengeich monitoring map in **Appendix B**. All four boreholes have historically indicated neutral pH and better water qualities and should therefore be added to the monitoring network to better analyse the impact of the mine.
- A groundwater monitoring network at Longridge should be established.
- Once-off monitoring at the adit at Natal Ammonia should be conducted to better analyse the source of the impacted water quality at VN Waterfall.
- Monitoring at the Old Cambrian Operation, comprising the old underground mine and discard dump (Smitties Dump), should be considered.

All wells should be surveyed to assess groundwater flow directions.

Options for mitigation or remediation measures should be prioritized at Ballengeich to control and reduce decant and seepage at the site, which will reduce the majority of Kangra's KwaZulu-Natal sites' collective impact.

- Artesian borehole GW1 should be decommissioned according to the ASTM D5299 - 99 Standard Guide for Decommissioning of Boreholes.
- Full rehabilitation of the Discard Dump;
- Rehabilitation of all coal fines around the Discard in the ponds and old river;
- Ensure that rehabilitation of the old opencast workings is maintained and that sinkholes are fixed;

- Phytoremediation is the preferred management measure because it will reduce recharge, require minimal input in terms of maintenance, management and energy/electricity and will not produce hazardous waste products.
- One of the water management measures that are applied at Ballengeich is the prevention of water ingress into the old opencast areas through phytoremediation. Fractal Forest was asked by GCS on behalf of Kangra to research and examine the growth potential of trees on coal-mined sites. Tree planting trials have been taking place since 2009 and the latest tree planting took place during December 2014 and January 2015.
- Surface operational implementation; ensure that the Siding (and other smaller operations) has its stormwater management - excessively contaminated surface water is currently flowing across to Ballengeich mine.
- Establishment of tree blocks to reduce recharge;
- Once all of the above is in place, continue with water monitoring for 24 months and undertake new risk and impact assessment on the Ngagane River; and
- Determine treatment requirements based on the risk.
 - Manage groundwater levels by pumping clean underground water from the western side of the workings and discharge; this will require a pre-feasibility assessment to understand the correct balance/equilibrium. The water can also be used to dilute the Horn River upstream or irrigate the water on tree plantations.
 - Implement a treatment plant to treat decant on the eastern side of the N11 (active or passive).

In terms of the remaining sites, all contaminated water generated should be contained within the Mining Right Area in appropriately lined waste storage facilities. The following is recommended for the management of the waste facilities on site (such as pollution control dams, return water dams and discard dumps):

- The lining of the dams is recommended to prevent seepage into the groundwater environment.
- Potential seepage in the shallow aquifer system, from the dams, should be monitored with down-gradient shallow piezometers.
- Effective management of storm water entering the site as well as controlling seepage from the dams will reduce the majority of the impact on the local aquifer.

- Phytoremediation down gradient of the waste management systems across the sites. This is considered to be the most effective option and can also be applied at the toe of the discard dump at Umgala.
- Passive treatment using biological sulphate treatment options.
 - There is a plan in place to remove the discard dump at Natal Ammonia and use a passive treatment option to treat the water, most likely an artificial wetland.
- Seepage from the discard dump at Utrecht must be controlled and no decant should be allowed to enter the Dorpspruit. Options for controlling the decant should be investigated.
- Data regarding the current level of flooding within the Aasvoelskrans workings may be of value in understanding oxidation/reduction conditions within the mine workings and distinguishing between flooded areas and dry areas, which would require mine workings and coal seam contours for the area.
- *The priority is to determine if recharge and oxidation are higher than they should be, either due to subsidence within the old mine workings or unrehabilitated areas in old opencast workings, resulting in acid mine drainage or saline mine drainage.*
- *Passive and active treatment options need to be assessed; pre-feasibility and feasibility studies will be required.*
- *The closure plans should be updated, where necessary.*

6 REFERENCES

Hartley, M., Hulley, V. 2003. Welgedacht Annual Water Quality Report (2002). PN 02-147. GCS.

Verger, R., van Zweel, N. 2014. Conceptual Solutions Ballengeich Colliery - Surface Water Report. PN 13-445. GCS

APPENDIX A: METHODOLOGY

Sampling was conducted according to the following guideline publications:

- ISO 5667-1 (2006):
 - Part 1: Guidance on the design of sampling programs and sampling techniques;
 - Part 3: Guidance on the preservation and handling of water samples;
 - Part 4: Guidance on sampling from lakes, natural and man-made;
 - Part 5: Guidance on sampling of drinking water from treatment works and piped distribution systems;
 - Part 6: Guidance on sampling of rivers and streams;
 - Part 10: Guidance on sampling of waste waters;
 - Part 11: Guidance on sampling of groundwater;
 - Part 14: Guidance on quality assurance of environmental water sampling and handling;
 - Part 18: Guidance on sampling of groundwater at contaminated sites;
 - Part 20: Guidance on the use of sampling data for decision-making – Compliance *with thresholds and classification systems*

Sampling Procedure

The sampling procedure for groundwater and surface water sites is discussed below.

Surface Water Sampling

The sampling localities have been based on the existing monitoring programme. The monitoring programme should focus on the mining activities and positioned in such a manner as to measure water quality upstream (up gradient) and downstream (down gradient) of the proposed mining activities. The surface water samples are collected as follows:

Surface water samples are collected and stored in a 500 ml plastic bottle. Samples are kept below 4°C in a dark container. All samples are submitted to X-Lab Earth Laboratory (Pty) Ltd (SANS Accreditation No T0775) for laboratory testing within 48 - 72 hours of sampling.

The monitoring measurements and samples are collected at each monitoring locality as follows:

- Monthly surface water sampling; and
- Quarterly surface water sampling.

Groundwater Sampling:

Groundwater samples are collected from boreholes as per the scope of work. Before taking borehole water samples, static groundwater levels are recorded using a dip meter. The groundwater samples are collected as follows:

- Quarterly groundwater sampling.

For each groundwater monitoring point, the following information was recorded:

- Field observations for each sampling point, consisting of the following information, are recorded on field data sheets (Appendix C):
- Date and time of sampling;
- In situ measurements for each sampling point, namely pH, electrical conductivity, total dissolved solids and temperature;
- General characteristics of the water samples such as colour, turbidity and smell as well as visual observations of the sample site.

Groundwater samples are collected 5m under the static groundwater level, using a PVC/polyethylene bailer and stored in a 500 ml plastic bottle. Samples are kept below 4°C in a dark container. All samples are submitted to X-Lab Earth Laboratory (Pty) Ltd (SANS Accreditation No T0775) for laboratory testing within 48 - 72 hours of sampling.

V-Notch weirs monitoring and installation guide

V-notch weir equations have become somewhat standardized. The equation that will be used for the monitoring program is the Kindvater-Shen equation, which is presented below:

$$Q = 4.28 * C * \tan\left(\frac{\theta}{2}\right) * (h + k)^{5/2}$$

Where:	Q	=	Discharge
	C	=	Discharge Coefficient
	θ	=	Notch Angle
	h	=	Head
	k	=	Head Correction Factor

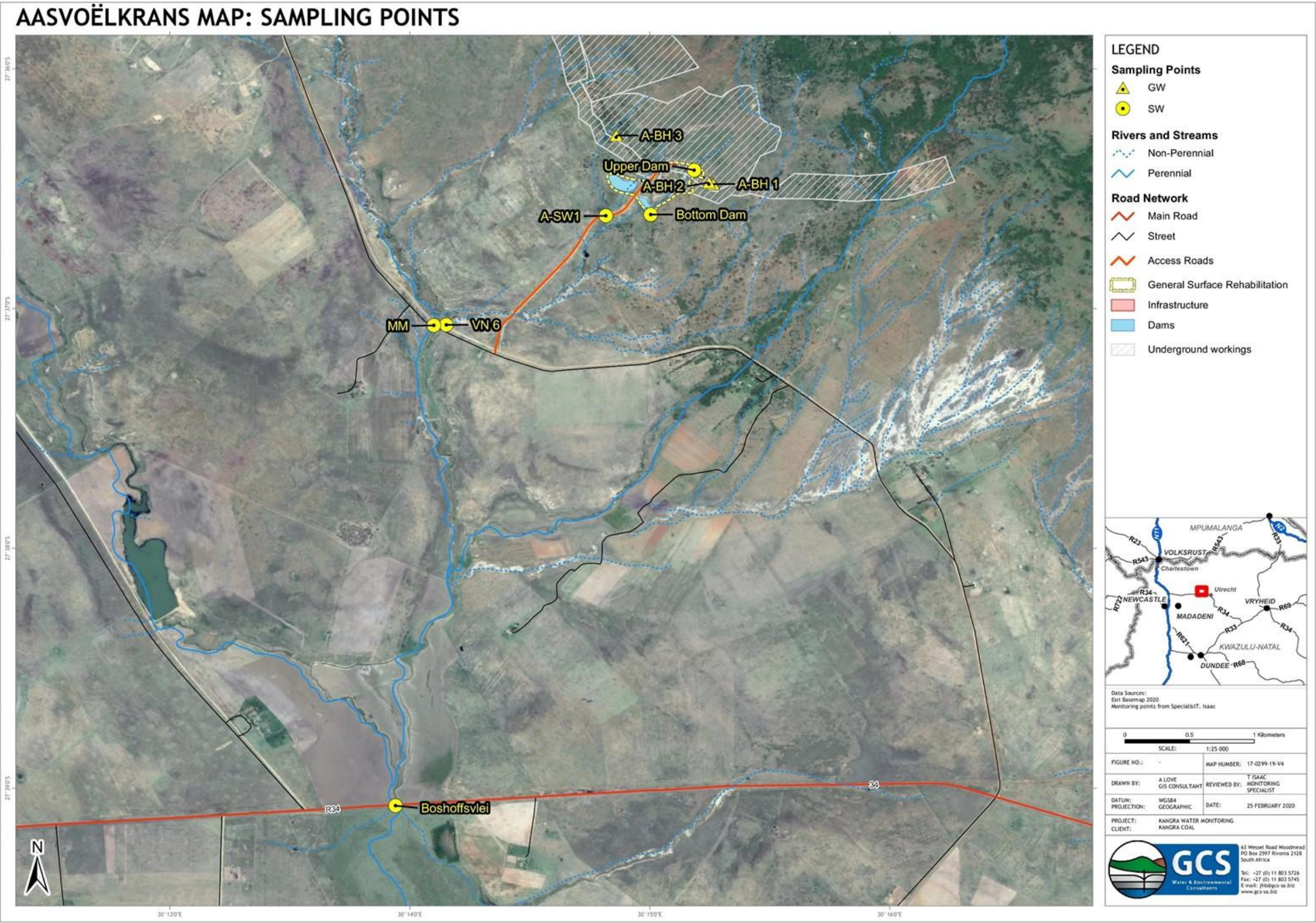
USBR (1997) suggest using the above-mentioned V-notch weir equation for the following conditions:

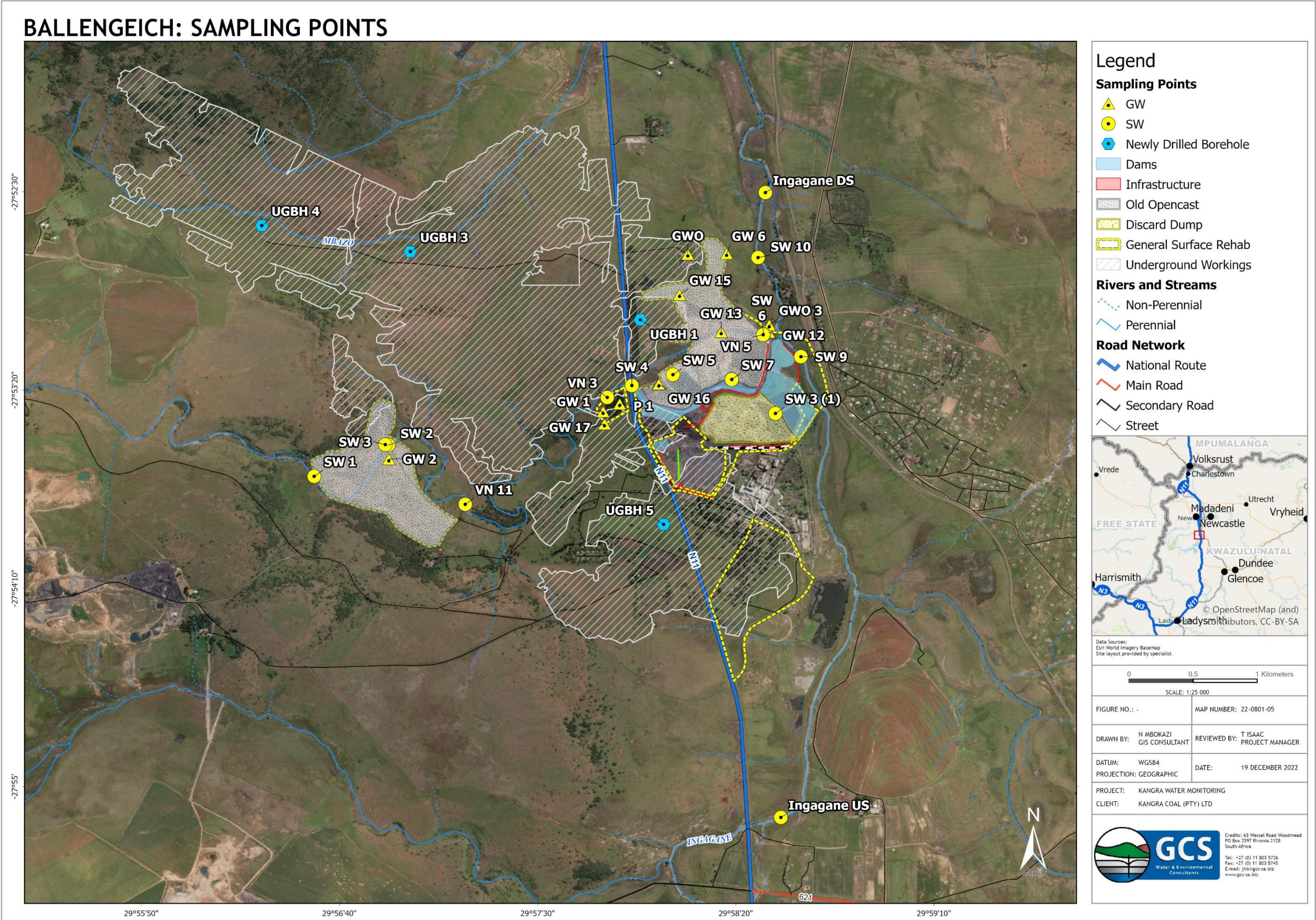
- Head (h) should be measured at a distance of at least 4h upstream of the weir.

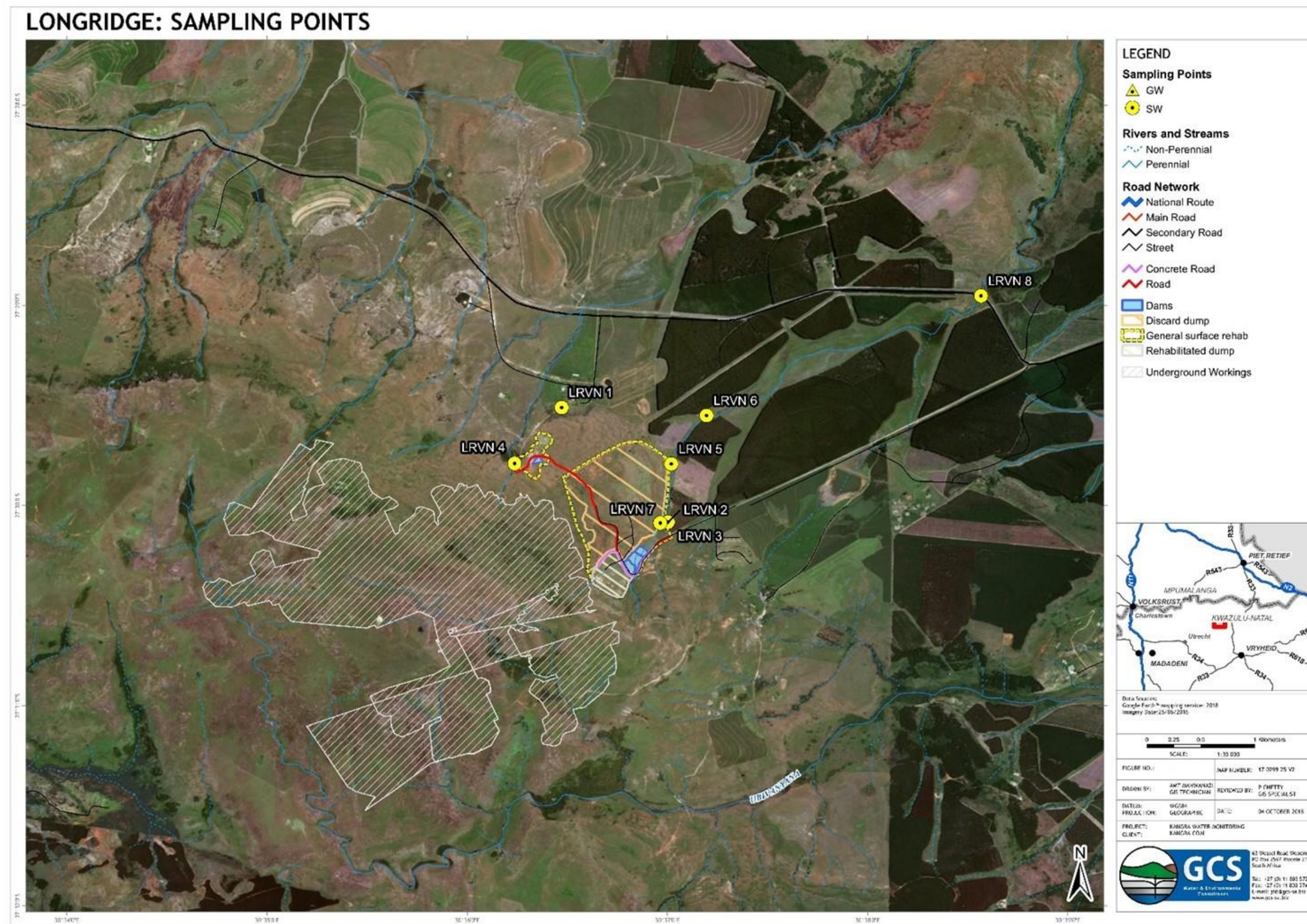
- The weir should be between 0.8 and 2.0 mm thick where the water flows over the weir through the 'V'. If the bulk of the weir is thicker than 2.0 mm, the downstream edge of the 'V' can be chamfered at an angle greater than 45° to achieve the desired thickness of the edges. Having the water cling to the downstream face of the weir should be avoided.
- The water surface downstream of the weir should be at least 6 cm below the bottom of the V to allow a free-flowing waterfall.
- The measured head (h) should be greater than 6 cm due to potential measurement error at such small heads and the fact that the nappe (waterfall) may cling to the weir.
- The bottom of the 'V' should be at least 45 cm above the bottom of the upstream channel (P).
- The above-mentioned equation has been developed for $h < 38$ cm and $h/P < 2.4$.
- The average width of the approach channel (B) should be > 91 cm.

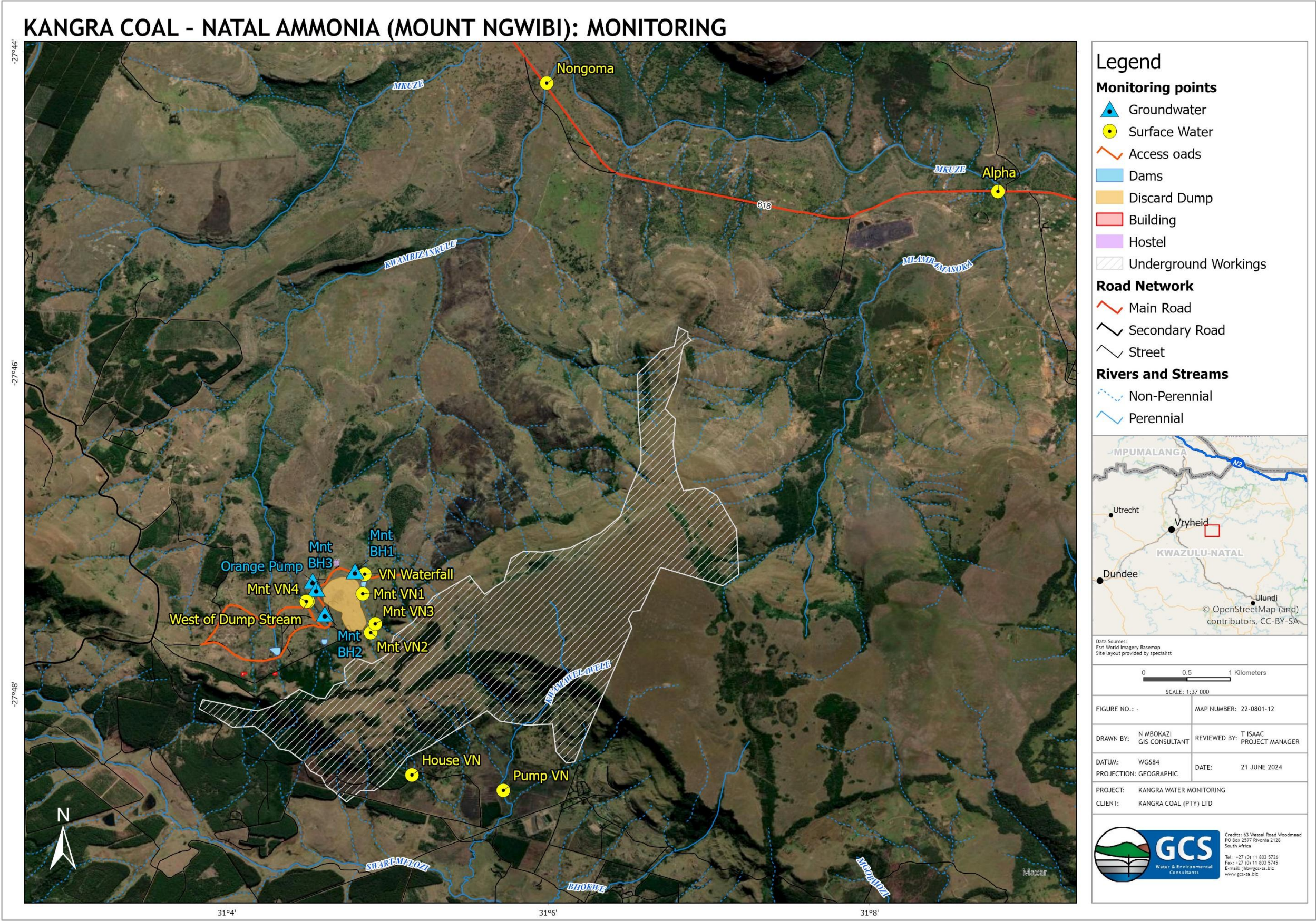
The above-mentioned equation has been developed for fully contracted V-notch weirs which means h/B should be ≤ 0.20 .

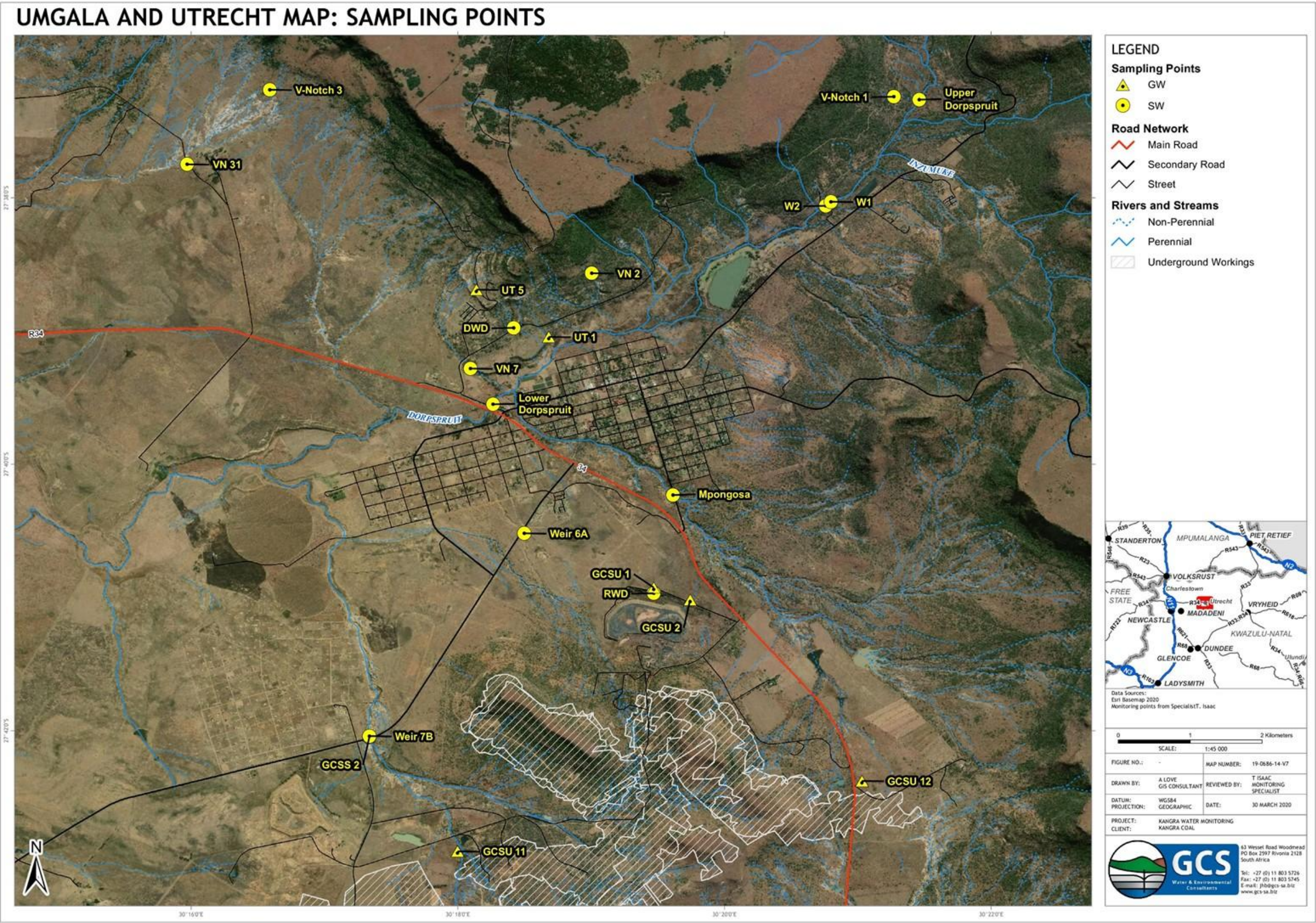
APPENDIX B: MONITORING MAPS

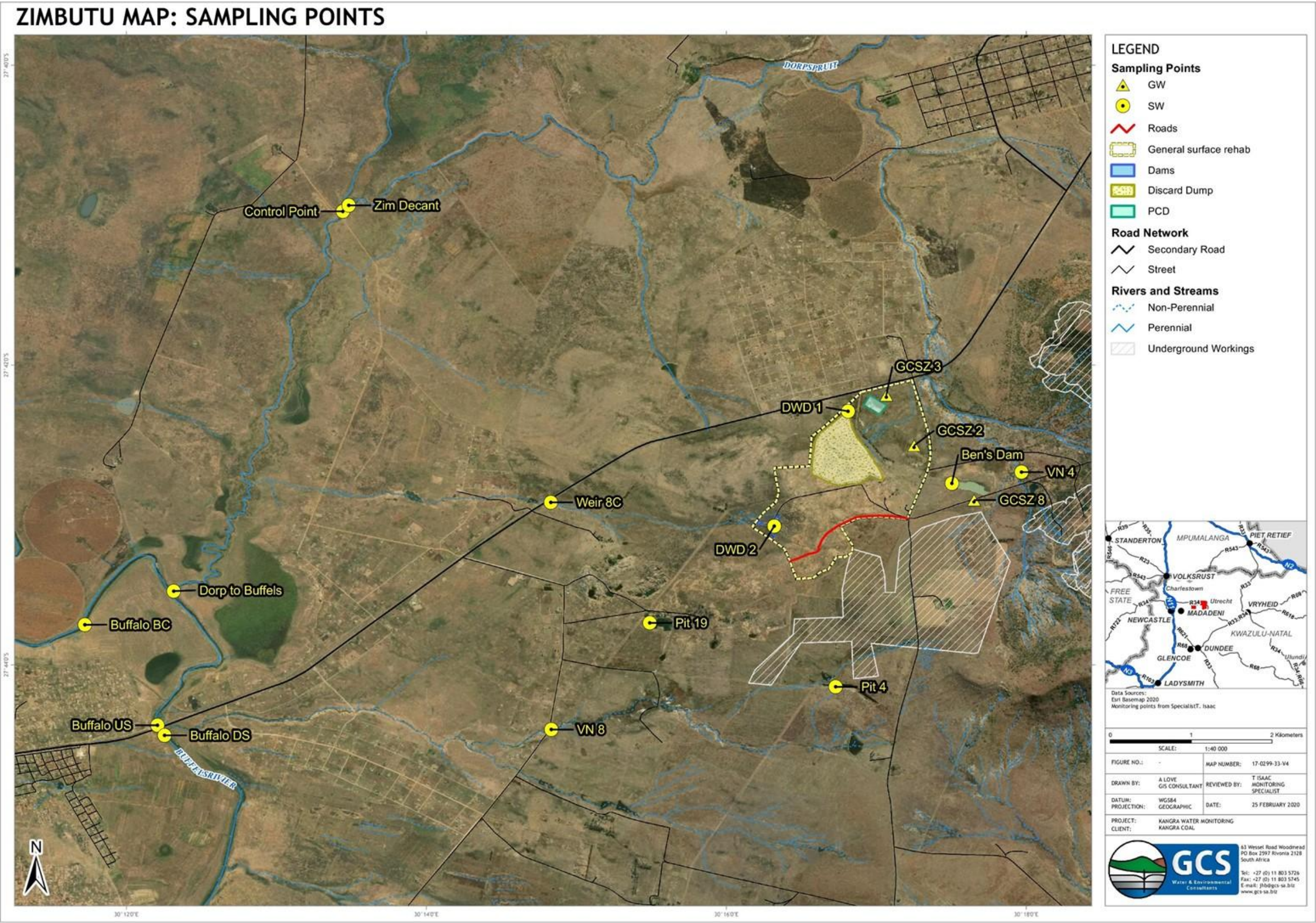












APPENDIX C: FIELD DATA

Sampling Period:						Feb 2026		
SITE ID	DATE	TIME	pH	EC (µS/cm)	TDS (mg/l)	TEMP (°C)	WATER FLOW	WATER DESCRIPTION
SW 1	17/02/2026	10:45	8.6	150	80	20.5	Medium	The water is brownish with no odour.
SW 10	17/02/2026	11:39	7.9	260	130	25.1	Medium	The water is brownish with no odour.
SW 4	17/02/2026	11:05	8	210	110	21.8	Medium	The water is brownish with no odour.
SW 6	17/02/2026	11:14	7.9	250	120	21.7	Medium	The water is brownish with no odour.
SW 9	17/02/2026	11:16	7.9	260	130	22.1	Medium	The water is brownish with no odour.
Ingangane US	17/02/2026	11:50	8.5	220	110	21.1	Medium	The water is brownish with no odour.
Ingangane DS	17/02/2026	13:18	8.2	280	140	23.2	Medium	The water is brownish with no odour.

Sampling Period:						Mar 2026		
SITE ID	DATE	TIME	pH	EC (µS/cm)	TDS (mg/l)	TEMP (°C)	WATER FLOW	WATER DESCRIPTION
SW 1	17/03/2026	12:40	8.2	270	130	27.8	Medium	The water is brownish with no odour.
SW 10	17/03/2026	13:43	7.7	340	170	28.4	Medium	The water is brownish with no odour.
SW 4	17/03/2026	13:01	8	260	130	26.0	Medium	The water is brownish with no odour.
SW 6	17/03/2026	13:11	7.7	310	160	27.3	Medium	The water is brownish with no odour.
SW 9	17/03/2026	13:14	8.1	250	130	27.2	Medium	The water is brownish with no odour.
Ingangane US	17/03/2026	12:15	8.2	250	130	29.1	Medium	The water is brownish with no odour.
Ingangane DS	17/03/2026	14:23	8.1	280	140	27.2	Medium	The water is brownish with no odour.

Sampling Period:						Apr 2026				
SITE ID	DATE	TIME	SWL (mbch)	BH DEPT H (m)	pH	EC (µS/cm)	TDS (mg/l)	TEMP (°C)	WATER FLOW	WATER DESCRIPTION
SURFACE WATER										
AASVOËLSKRANS										
Bottom Dam	10/04/2026	10:30			7.4	180	90	21.1	Medium	The water is brownish with no odour.
Upper Dam	10/04/2026	09:55			7.4	250	120	24.6	Medium	The water is brownish with no odour.
VN 6	10/04/2026	10:52			6.7	330	160	25.8	Medium	The water is brownish with no odour.
MM	10/04/2026	10:47			7.2	300	150	23.9	Medium	The water is brownish with no odour.
Boshoffsylei	10/04/2026	09:00			7.5	310	150	20.3	Medium	The water is brownish with no odour.
A-SW1	10/04/2026	10:22			7	230	120	20.9	Medium	The water is brownish with no odour.
NATAL CAMBRIAN: BALLENGEICH										
SW 1	09/04/2026	10:10			3.5	ADL	ADL	27.3	Dam	The water is brownish with no odour.

Sampling Period:						Apr 2026				
SITE ID	DATE	TIME	SWL (mbch)	BH DEPT H (m)	pH	EC (µS/cm)	TDS (mg/l)	TEMP (°C)	WATER FLOW	WATER DESCRIPTION
SW 4	08/04/2026	14:47			4	3470	1330	25.9	Dam	The water is clear with no odour.
SW 6	08/04/2026	15:32			7.5	290	150	22.9	Medium	The water is brownish with no odour.
SW 9	08/04/2026	15:36			7.2	200	100	20.6	Medium	The water is brownish with no odour.
SW 10	08/04/2026	08:22			7.6	5540	2770	20.4	Medium	The water is blackish with odour.
SW 2	09/04/2026	09:48			3.9	4060	2040	25.9	Dam	The water is clear with no odour.
SW 3	09/04/2026		Dry		7.5	260	130	25.8	Medium	The water is brownish with no odour.
SW 3(1)	08/04/2026	15:19			6.8	440	220	23.1	Medium	The water is brownish with no odour.
SW 5	08/04/2026	16:58			7.4	180	90	21.1	Medium	The water is brownish with no odour.
VN 5	08/04/2026	15:04			7.4	250	120	24.6	Medium	The water is brownish with no odour.
VN 11	09/04/2026	09:40			6.7	330	160	25.8	Medium	The water is brownish with no odour.
VN 3	09/04/2026	09:17			7.2	300	150	23.9	Medium	The water is brownish with no odour.
SW7	08/04/2026	15:16			7.5	310	150	20.3	Medium	The water is brownish with no odour.
Ingagane US	08/04/2026	14:12			7	230	120	20.9	Medium	The water is brownish with no odour.
Ingagane DS	09/04/2026	10:33								
LONGRIDGE										
LRVN 1	11/04/2026									No access, gate locked by the farmer.
LRVN 2	11/04/2026	12:10			8.4	460	230	26.1	Medium	The water is clear with no odour.
LRVN 3	11/04/2026	12:15	Dry		8.6	780	390	26.9	Low	The water is clear with no odour.
LRVN 4	11/04/2026	13:35			8.1	470	240	29.1	Strong	The water is clear with no odour.
LRVN 5	11/04/2026	12:40			8.5	2000	1010	26.6	Medium	The water is clear with no odour.
LRVN 6	11/04/2026	12:45			8.4	920	460	27.2	Low	The water is clear with no odour.
LRVN 7	11/04/2026	12:20			8.3	1010	510	27.7	Low	The water is clear with no odour.
LRVN 8	11/04/2026	15:40			8	480	240	25.2	Medium	The water is clear with no odour.
LRVN 9	11/04/2026	15:58			8.3	280	140	28.2	Medium	The water is clear with no odour.
NATAL AMMONIA: MOUNT NGWIBI										
House VN	11/04/2026	10:10			8.3	610	310	21	Medium	The water is clear with no odour.
Pump VN	11/04/2026	09:51			8.7	550	270	21	Medium	The water is clear with no odour.
Nongoma	11/04/2026	08:47			8.2	390	190	24.4	Medium	The water is clear with no odour.
Alpha	11/04/2026	08:35			8.2	530	270	26.4	Medium	The water is clear with no odour.
VN Waterfall	11/04/2026									Stopped from sampling.
West of Dump Stream	11/04/2026									Stopped from sampling.
UMGALA & KNIGHT HILL										
GCSS 2	09/04/2026	14:18			8.8	3020	1510	31.6	Low	The water is clear with no odour.
RWD	09/04/2026	14:35			8.5	4730	2370	27.8	Dam	The water is clear with no odour.
RWD Seepage	09/04/2026	13:45			8.1	5060	2530	29.3	Low	The water is clear with no odour.

Sampling Period:						Apr 2026				
SITE ID	DATE	TIME	SWL (mbch)	BH DEPT H (m)	pH	EC (µS/cm)	TDS (mg/l)	TEMP (°C)	WATER FLOW	WATER DESCRIPTION
Weir 7B	09/04/2026	14:14			8.8	3150	1580	27.3	Low	The water is clear with no odour.
Mpongosa	10/04/2026	14:46			8.5	620	310	29.2	Low	The water is clear with no odour.
UTRECHT										
V-Notch 1	10/04/2026	13:25			8.9	1020	510	26.2	Medium	The water is clear with no odour.
VN 31	10/04/2026	11:05			9	2280	1140	28.9	Low	The water is clear with no odour.
VN 7	10/04/2026	11:42			8	1020	510	24.7	Medium	The water is clear with no odour.
VN 2	10/04/2026	14:15			9	1470	730	26.3	Medium	The water is clear with no odour.
V-Notch 3	10/04/2026		Banned							
DWD	10/04/2026	11:31			8.6	120	60	24.6	Medium	The water is clear with no odour.
W2	10/04/2026	13:45			8.5	110	50	27.1	Medium	The water is clear with no odour.
W1	10/04/2026	13:30			9	410	200	28.3	Low	The water is clear with no odour.
Weir 6A	10/04/2026	14:00			8.2	310	150	31.2	Medium	The water is slightly brown with no odour.
Lower Dorpspruit	10/04/2026	11:57			8.3	100	50	29.4	Medium	The water is clear with no odour.
Upper Dorpspruit	10/04/2026	13:11			8.6	120	60	24.6	Medium	The water is clear with no odour.
ZIMBUTU										
Control Point	10/04/2026	08:38			8.1	180	90	25.7	Medium	The water is slightly brown with no odour.
Zim Decant	10/04/2026	08:35			7.8	290	140	25.2	Medium	The water is slightly brown with no odour.
Ben's Dam	09/04/2026	14:40			8	210	100	28.4	Dam	The water is clear with no odour.
Pit 19	09/04/2026	13:08			4.1	ADL	ADL	26.1	Dam	The water is clear with no odour.
DWD 1	09/04/2026	16:16			8	4700	2350	24.7	Dam	The water is greyish with no odour. Vegetation is covering the dam.
DWD 2	09/04/2026	16:00			8.1	430	220	26.1	Dam	The water is slightly brown with no odour.
Pit 4	09/04/2026	15:13			8.5	1740	870	25.2	Dam	The water is clear with no odour.
Buffalo US	09/04/2026	12:15			7.5	210	110	24.5	Medium	The water is brownish with no odour.
Buffalo DS	09/04/2026	12:19			7.4	240	120	24.8	Medium	The water is brownish with no odour.
Buffalo BC	09/04/2026	11:55			7.2	290	140	27.8	Medium	The water is brownish with no odour.
Dorp to Buffels	09/04/2026	12:36			8	570	280	27.8	Medium	The water is slightly brown with no odour.
VN 4	09/04/2026	14:52			8	3050	1520	28.8	Low	The water is clear with no odour.
VN 8	09/04/2026	12:55			7.4	4870	2440	28.5	Medium	The water is clear with no odour.
Weir 8C	09/04/2026									Dry
GROUNDWATER										
AASVOËLSKRANS										
A-BH 1	10/04/2026	09:42	23.2		7.5	330	160	23.7		The water is clear with no odour.
A-BH 2	10/04/2026									Blocked
A-BH 3	10/04/2026	10:30	23.72		7.4	1000	500	22.8		The water is clear with no odour.

Sampling Period:						Apr 2026				
SITE ID	DATE	TIME	SWL (mbch)	BH DEPT H (m)	pH	EC (µS/cm)	TDS (mg/l)	TEMP (°C)	WATER FLOW	WATER DESCRIPTION
NATAL CAMBRIAN: BALLENGEICH										
GWO	08/04/2026	08:30			8	780	390	19.8		The water is clear with no odour.
P1										
P2										
GWO 3	09/04/2026	08:14	2.56		5.4	1350	670	19.1		The water is clear with no odour.
GW 1	09/04/2026	09:15	Artesian		6.7	4880	2440	20.9		The water is clear with no odour.
GW 2	09/04/2026	10:00	5.62		6.7	830	420	22.3		The water is clear with no odour.
GW 6	09/04/2026	08:18	4.13		6	350	170	20.2		The water is whitish with no odour.
GW 12	08/04/2026	15:28	2.62		4.1	3040	1520	24.1		The water is slightly brown with no odour.
GW 13	08/04/2026	15:06	7.02		4.2	4260	2140	26.8		The water is clear with no odour.
GW 15	09/04/2026	08:05	9.87		4.8	2160	1080	20.2		The water is clear with no odour.
GW 16	08/04/2026	14:56	1		6.7	4360	2180	23.4		The water is clear with no odour.
GW 17	08/04/2026	09:01	2.53		6.8	330	170	20.4		The water is brownish with no odour.
NATAL AMMONIA: MOUNT NGWIBI										
Orange Pump										
Mnt BH1	11/04/2026									Stopped from sampling.
Mnt BH2	11/04/2026									Stopped from sampling.
Mnt BH3	11/04/2026									Stopped from sampling.
UMGALA & KNIGHT HILL										
GCSU 1	09/04/2026	13:48	1.94		7.7	1060	530	24.9		The water is slightly blackish with odour.
GCSU 11	09/04/2026	14:53	1.53		7.4	2500	1250	26.1		The water is clear with no odour.
GCSU 12	10/04/2026									Dry
UTRECHT										
UT 1	10/04/2026									Blocked
UT 5	10/04/2026	11:20	1.84		7.8	610	300	27		The water is clear with no odour.
ZIMBUTU										
GCSZ 8	09/04/2026	14:35	11.8		8.3	230	110	23.5		The water is clear with no odour.
GCSZ 2	09/04/2026									
GCSZ 3	09/04/2026									

APPENDIX D: WATER QUALITY GUIDELINE VALUES

Mean ambient groundwater quality for the Welgedacht operations (Hartley *et al.*, 2003)

Variables(s)	Mean Ambient Groundwater
pH	7.5
Conductivity (mS/m)	52.1
TDS (mg/l)	332
Ammonia (mg/l)	ND
Nitrate NO ₃ as N (mg/l)	0.05
Nitrite (mg/l)	0.05
Chloride (mg/l)	19.7
Sulphate (mg/l)	18.1
Sodium (mg/l)	56.7
Potassium (mg/l)	3.18
Calcium (mg/l)	14
Magnesium (mg/l)	8.24
Aluminium (mg/l)	0.02
Iron (mg/l)	0.02
Flouride (mg/l)	
Manganese (mg/l)	0.02

Limits for constituents set out by the DWAF (1996) Target Water Quality Limits for Potable Use

Variable (s)	Horn River Quality Objective	Ngagane River Quality Objectives
pH	6.5-8.4	6.5-8.4
Conductivity (mS/m)	40	40
Suspended Solids (mg/l)	50	50
TDS (mg/l)	260	260
Total Alkalinity (mg/l)	-	-
Chloride (mg/l)	100	100
Sulphate (mg/l)	200	200
Fluoride (mg/l)	0.75	0.75
Sodium (mg/l)	70	70
Potassium (mg/l)	50	50
Calcium (mg/l)	32	32
Ammonia (mg/l)	0.007	0.007
Magnesium(mg/l)	30(70)	30(70)
Total Phosphorus (mg/l)	0.02	0.02
Aluminium (Dissolved) (mg/l)	0.5	0.5

Mean ambient surface water quality for the Welgedacht operations (Hartley *et al.*, 2003)

Variables(s)	Mean Ambient Surface Water
pH	7.9
Conductivity (mS/m)	19.6
TDS (mg/l)	122
Ammonia (mg/l)	ND
Nitrate NO ₃ as N (mg/l)	0.24
Chloride (mg/l)	7.6
Sulphate (mg/l)	9.5
Sodium (mg/l)	6.8
Potassium (mg/l)	0.26
Calcium (mg/l)	16.33
Magnesium (mg/l)	9.98
Aluminium (mg/l)	0.05
Iron (mg/l)	0.04
Flouride (mg/l)	0.04
Manganese	0.02

Water Quality Objective for the Horn and Ngagane Rivers (Verger *et al.*, 2014)

Variable (s)	Horn River Quality Objective	Ngagane River Quality Objectives
pH	6.5-8.4	6.5-8.4
Conductivity (mS/m)	40	40
Suspended Solids (mg/l)	50	50
TDS (mg/l)	260	260
Total Alkalinity (mg/l)	-	-
Chloride (mg/l)	100	100
Sulphate (mg/l)	200	200
Fluoride (mg/l)	0.75	0.75
Sodium (mg/l)	70	70
Potassium (mg/l)	50	50
Calcium (mg/l)	32	32
Ammonia (mg/l)	0.007	0.007
Magnesium(mg/l)	30(70)	30(70)
Total Phosphorus (mg/l)	0.02	0.02
Aluminium (Dissolved) (mg/l)	0.5	0.5

APPENDIX E: HYDROCHEMICAL RESULTS

AASVOËLSKRANS GROUNDWATER QUALITY			
Parameters	Mean Ambient Groundwater Quality	A-BH1	A-BH3
		Apr-26	Apr-26
pH	≥ 6 to $9 \leq$	7.10	7.00
EC mS/m	< 52.1	31.00	100.00
TDS	< 332	210.00	630.00
Ca	< 14	25.00	130.00
Mg	< 8.24	19.00	57.00
Na	< 56.7	17.00	41.00
K	< 3.18	0.90	4.90
Tot. Alk	< 212.7	140.00	260.00
Cl	< 19.7	3.10	4.70
SO ₄	< 18.1	9.30	360.00
NO ₂ as NO ₂	< 0.05	< 0.5	<0.5
NO ₃ as NO ₃	< 0.05	0.59	0.34
F	n/s	<0.05	0.38
Al	< 0.02	<0.02	<0.02
Fe	< 0.02	<0.05	<0.05
Mn	< 0.02	< 0.01	0.10
Ammonia as N	n/s	<0.01	<0.01
Tot. Hardness	n/s	142.10	560.10
Ca Hardness	n/s	63.70	327.10
Mg Hardness	n/s	78.40	233.00
B	n/s	< 0.005	0.01
Si	n/s	21.00	15.00
SS	n/s	< 21	< 21
Bicarbonate	n/s	140.00	260.00

UMGALA GROUNDWATER QUALITY				
Parameters	Mean Ambient Groundwater Quality	GCSU 1	GCSU 11	GCSU 12
		Apr-26	Apr-26	Apr-26
pH	≥ 6 to $9 \leq$	7.80	6.70	Dry
EC mS/m	< 52.1	120.00	340.00	
TDS	< 332	790.00	2500.00	
Ca	< 14	48.00	210.00	
Mg	< 8.24	71.00	180.00	
Na	< 56.7	93.00	180.00	
K	< 3.18	18.00	30.00	
Tot. Alk	< 212.7	320.00	150.00	
Cl	< 19.7	11.00	5.70	
SO ₄	< 18.1	260.00	1500.00	
NO ₂ as NO ₂	< 0.05	< 0.5	< 0.5	
NO ₃ as NO ₃	< 0.05	0.19	0.13	
F	n/s	0.22	0.14	
Al	< 0.02	< 0.02	< 0.02	
Fe	< 0.02	< 0.05	< 0.05	
Mn	< 0.02	0.31	1.40	
Ammonia as N	n/s	0.06	1.90	
Tot. Hardness	n/s	414.10	1281.50	
Ca Hardness	n/s	120.20	532.80	
Mg Hardness	n/s	293.80	748.70	
B	n/s	0.02	0.01	
Si	n/s	8.00	3.40	
SS	n/s	22.00	< 21	
Bicarbonate	n/s	320.00	150.00	

UTRECHT GROUNDWATER QUALITY			
Parameters	Mean Ambient Groundwater Quality	UT 1	UT 5
		Apr-26	Apr-26
pH	≥ 6 to $9 \leq$	Blocked	6.60
EC mS/m	< 52.1		50.00
TDS	< 332		380.00
Ca	< 14		39.00
Mg	< 8.24		15.00
Na	< 56.7		26.00
K	< 3.18		2.80
Tot. Alk	< 212.7		40.00
Cl	< 19.7		16.00
SO ₄	< 18.1		180.00
NO ₂ as NO ₂	< 0.05		< 0.5
NO ₃ as NO ₃	< 0.05		0.20
F	n/s		0.42
Al	< 0.02		< 0.02
Fe	< 0.02		< 0.05
Mn	< 0.02		0.78
Ammonia as N	n/s		0.41
Tot. Hardness	n/s		158.70
Ca Hardness	n/s		96.30
Mg Hardness	n/s		62.40
B	n/s		0.01
Si	n/s		5.50
SS	n/s		< 21
Bicarbonate	n/s		40.00

Zimbutu Groundwater Quality			
Parameters	Mean Ambient Groundwater Quality	GCSZ 8	GCSZ 2
		Apr-26	Apr-26
pH	≥ 6 to $9 \leq$	6.60	Blocked
EC mS/m	< 52.1	23.00	
TDS	< 332	160.00	
Ca	< 14	12.00	
Mg	< 8.24	4.60	
Na	< 56.7	22.00	
K	< 3.18	3.70	
Tot. Alk	< 212.7	35.00	
Cl	< 19.7	21.00	
SO ₄	< 18.1	17.00	
NO ₂ as NO ₂	< 0.05	<0.5	
NO ₃ as NO ₃	< 0.05	26.00	
F	n/s	<0.05	
Al	< 0.02	0.10	
Fe	< 0.02	<0.05	
Mn	< 0.02	<0.01	
Ammonia as N	n/s	<0.01	
Tot. Hardness	n/s	48.20	
Ca Hardness	n/s	29.40	
Mg Hardness	n/s	18.80	
B	n/s	<0.005	
Si	n/s	12.00	
SS	n/s	22.00	
Bicarbonate	n/s	35.00	

NATAL CAMBRIAN & BALLENGEICH GROUNDWATER QUALITY															
Parameters	Horn and Ngagane Quality Objectives	GW0	GW03	GW1	GW2	GW6	GW12	GW13	GW 15	GW16	GW17	UGBH1	UGBH3	UGBH4	UGBH5
		Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26
pH	6.5 - 8.4	7.40	5.60	5.40	6.60	6.60	2.60	2.70	3.40	3.00	6.80	2.80	Dry	Dry	7.20
EC mS/m	< 40	99.00	130.00	670.00	82.00	30.00	440.00	660.00	350.00	660.00	23.00	360.00			22.00
TDS	< 260	550.00	990.00	6500.00	710.00	370.00	3400.00	6900.00	4300.00	6000.00	190.00	2700.00			210.00
Ca	< 32	40.00	71.00	540.00	98.00	27.00	350.00	760.00	160.00	550.00	15.00	480.00			19.00
Mg	< 30	22.00	45.00	430.00	65.00	12.00	160.00	940.00	470.00	510.00	11.00	270.00			13.00
Na	< 70	180.00	230.00	920.00	10.00	18.00	160.00	240.00	18.00	860.00	22.00	53.00			6.50
K	< 50	7.20	4.20	71.00	7.10	3.80	47.00	31.00	24.00	52.00	1.90	19.00			1.80
Tot. Alk	n/s	260.00	15.00	40.00	100.00	15.00	<12	<12	<12	<12	90.00	<12			95.00
Cl	< 100	73.00	2.10	160.00	3.80	1.20	4.70	5.20	0.63	120.00	1.80	3.50			3.10
SO4	< 200	140.00	690.00	4200.00	370.00	120.00	2900.00	5900.00	2400.00	4400.00	21.00	2200.00			7.50
NO2 as NO2	n/s	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5
NO3 as NO3	n/s	2.60	0.65	< 0.1	1.10	0.88	<0.1	<0.1	1.10	<0.1	0.38	<0.1			0.77
F	< 0.75	1.10	<0.05	<0.05	0.12	<0.05	0.30	2.90	1.50	0.25	<0.05	0.58			0.10
Al	n/s	<0.02	<0.02	<0.02	<0.02	<0.02	3.80	31.00	9.10	0.03	<0.02	8.40			<0.02
Fe	n/s	<0.05	<0.05	< 0.05	<0.05	<0.05	410.00	230.00	0.44	11.00	< 0.05	24.00			<0.05
Mn	n/s	0.07	0.18	3.70	0.58	0.22	33.00	59.00	110.00	10.00	0.05	27.00			<0.01
Ammonia as N	< 0.007	<0.012	0.02	6.70	0.02	< 0.012	0.58	0.28	1.10	3.70	0.19	0.90			< 0.01
Tot. Hardness	n/s	189.20	364.30	3099.40	511.60	118.20	1538.70	5771.20	2321.80	3476.80	83.70	2304.50			102.10
Ca Hardness	n/s	100.50	178.40	1347.30	245.80	67.20	883.00	1894.40	393.00	1365.50	38.50	1201.20			47.20
Mg Hardness	n/s	88.70	186.00	1752.20	265.80	51.00	655.80	3876.80	1928.80	2111.30	45.20	1103.30			54.90
B	n/s	0.04	0.01	0.11	0.01	0.01	0.11	0.06	0.01	0.07	< 0.005	0.04			<0.005
Si	n/s	13.00	19.00	11.00	6.70	12.00	22.00	32.00	19.00	14.00	22.00	23.00			29.00
SS	< 50	< 21	< 21	190.00	<21	3200.00	22.00	< 21	<21	170.00	74.00	62.00			40.00
Bicarbonate	n/s	260.00	15.00	40.00	100.00	15.00	<12	<12	<12	<12	90.00	<12			95.00

AASVOËLSKRANS SURFACE WATER QUALITY							
Parameters	Mean Ambient Surface Water	Bottom Dam	Upper Dam	MM	Boshoffvlei	VN 6	A-SW1
		Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26
pH	6.0 - 9.0	7.80	7.20	8.00	7.90	7.80	6.90
EC mS/m	19.6	38.00	20.00	30.00	27.00	42.00	28.00
TDS	122	230.00	130.00	200.00	200.00	290.00	170.00
Ca	16.33	38.00	17.00	28.00	21.00	31.00	26.00
Mg	9.98	24.00	9.70	14.00	11.00	26.00	16.00
Na	6.8	19.00	9.10	22.00	24.00	33.00	14.00
K	0.26	3.20	6.50	1.90	1.70	7.30	0.30
M Alk	n/s	160.00	85.00	130.00	95.00	200.00	130.00
Cl	7.6	12.00	8.40	18.00	4.90	12.00	0.09
SO ₄	9.5	24.00	0.75	5.60	31.00	12.00	11.00
F	0.04	0.32	0.15	0.25	0.14	0.61	0.37
Al	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fe	0.04	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Mn	0.02	<0.01	<0.01	<0.01	< 0.01	<0.01	<0.01
Tot Hardness	n/s	193.70	83.70	129.60	98.50	182.80	131.80
CaHardness	n/s	96.00	43.70	71.10	51.50	77.30	63.80
MgHardness	n/s	97.70	40.10	58.40	47.00	105.50	67.90
B	n/s	<0.005	<0.005	<0.005	<0.005	<0.005	< 0.005
Si	n/s	3.00	4.90	12.00	10.00	9.00	12.00
SS	n/s	36.00	24.00	38.00	< 21	< 21	190.00
Bicarbonate	n/s	160.00	85.00	130.00	95.00	200.00	130.00
Nitrate as NO ₃	0.24	<0.03	< 0.03	< 0.03	0.09	<0.03	0.04
NH ₃	n/s	<0.012	0.44	<0.012	<0.012	0.06	<0.012
Nitrite as NO ₂	0.24	<0.15	0.30	<0.15	<0.15	< 0.15	0.21

UMGALA SURFACE WATER QUALITY						
Parameters	Mean Ambient Surface Water	RWD	Weir 7B	GCSS2	Mpongosa	RWD Seepage
		Apr-26	Apr-26	Apr-26	Apr-26	Apr-26
pH	6.0 - 9.0	8.00	8.10	8.00	8.10	7.90
EC mS/m	19.6	610.00	420.00	400.00	66.00	640.00
TDS	122	6000.00	3700.00	2500.00	380.00	6500.00
Ca	16.33	670.00	530.00	88.00	48.00	670.00
Mg	9.98	720.00	390.00	130.00	38.00	760.00
Na	6.8	560.00	220.00	490.00	26.00	610.00
K	0.26	76.00	15.00	78.00	3.00	79.00
M Alk	n/s	240.00	180.00	310.00	260.00	220.00
Cl	7.6	44.00	3.00	93.00	22.00	37.00
SO ₄	9.5	3300.00	2100.00	1300.00	42.00	3800.00
F	0.04	0.26	0.19	1.00	0.27	0.28
Al	0.05	<0.02	<0.02	< 0.02	< 0.02	<0.02
Fe	0.04	<0.05	<0.05	<0.05	<0.05	<0.05
Mn	0.02	< 0.01	<0.01	<0.01	<0.01	< 0.01
Tot Hardness	n/s	4647.40	2928.10	748.70	275.30	4802.50
CaHardness	n/s	1679.80	1314.70	218.80	120.60	1677.00
MgHardness	n/s	2967.60	1613.40	529.90	154.60	3125.50
B	n/s	0.12	0.01	0.01	< 0.005	0.13
Si	n/s	< 1	6.20	< 1	6.50	1.40
SS	n/s	< 21	< 21	< 21	200.00	< 21
Bicarbonate	n/s	240.00	180.00	310.00	260.00	220.00
Nitrate as NO ₃	0.24	<0.03	<0.03	<0.03	<0.03	< 0.03
NH ₃	n/s	0.28	<0.012	0.23	0.04	0.27
Nitrite as NO ₂	0.24	<0.15	<0.15	<0.15	<0.15	<0.15

UTRECHT SURFACE WATER QUALITY											
Parameters	Mean Ambient Surface Water	DWD	V-Notch 1	VN2	VN7	VN31	W2	W1	Lower Dorpspruit	Upper Dorpspruit	Weir 6A
		Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26
pH	6.0 - 9.0	7.50	8.30	8.20	7.90	8.60	8.20	8.20	7.70	7.60	7.90
EC mS/m	19.6	460.00	120.00	230.00	120.00	320.00	15.00	15.00	27.00	9.70	31.00
TDS	122	3700.00	870.00	1300.00	920.00	1700.00	100.00	92.00	200.00	74.00	180.00
Ca	16.33	270.00	24.00	73.00	89.00	21.00	8.30	8.00	17.00	5.50	15.00
Mg	9.98	310.00	4.00	52.00	55.00	38.00	5.20	5.00	10.00	4.00	9.30
Na	6.8	440.00	230.00	240.00	60.00	480.00	11.00	11.00	17.00	4.30	27.00
K	0.26	26.00	8.30	14.00	2.50	22.00	0.60	0.60	1.00	0.70	2.70
M Alk	n/s	180.00	290.00	280.00	310.00	380.00	60.00	60.00	90.00	40.00	110.00
Cl	7.6	16.00	13.00	4.50	35.00	38.00	4.20	4.20	6.00	4.30	7.60
SO ₄	9.5	2400.00	310.00	700.00	320.00	850.00	12.00	10.00	33.00	2.20	39.00
F	0.04	0.83	1.60	0.92	0.69	0.78	< 0.05	0.06	0.09	<0.05	0.17
Al	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fe	0.04	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	< 0.05	<0.05	< 0.05	<0.05
Mn	0.02	<0.01	< 0.01	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tot Hardness	n/s	1943.90	75.20	398.30	446.70	210.90	42.00	40.50	83.60	30.20	76.30
CaHardness	n/s	676.50	58.80	182.40	221.40	52.90	20.70	20.00	42.10	13.70	38.10
MgHardness	n/s	1267.40	16.40	215.90	225.40	158.00	21.30	20.50	41.40	16.50	38.20
B	n/s	0.04	0.06	0.02	0.01	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Si	n/s	3.10	7.10	5.60	6.90	7.30	6.00	6.10	6.20	5.60	3.90
SS	n/s	< 21	< 21	60.00	< 21	58.00	< 21	84.00	< 21	42.00	<21
Bicarbonate	n/s	180.00	290.00	280.00	310.00	380.00	60.00	60.00	90.00	40.00	110.00
Nitrate as NO ₃	0.24	<0.1	1.60	0.31	0.22	1.80	0.11	0.20	1.50	0.26	<0.1
NH ₃	n/s	0.18	< 0.01	0.05	<0.01	0.16	<0.01	< 0.01	<0.01	0.06	0.02
Nitrite as NO ₂	0.24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Zimbutu Quarterly Monitoring							
Parameters	Mean Ambient Surface Water	Control Point	Zim Decant	Ben's Dam	Pit 19	DWD 1	DWD 2
		Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26
pH	6.0 - 9.0	8.70	7.60	7.50	2.90	6.90	7.00
EC mS/m	19.6	160.00	31.00	19.00	850.00	650.00	34.00
TDS	122	1100.00	190.00	130.00	10000.00	7000.00	180.00
Ca	16.33	27.00	20.00	11.00	640.00	630.00	12.00
Mg	9.98	30.00	12.00	7.60	1100.00	870.00	9.70
Na	6.8	280.00	22.00	7.30	470.00	390.00	33.00
K	0.26	12.00	1.60	3.60	76.00	140.00	7.90
M Alk	n/s	300.00	140.00	60.00	<12	240.00	140.00
Cl	7.6	25.00	5.00	3.90	60.00	51.00	7.10
SO ₄	9.5	530.00	7.50	26.00	7200.00	4600.00	19.00
F	0.04	0.51	0.27	0.62	4.00	<0.05	0.39
Al	0.05	<0.02	<0.02	<0.02	49.00	<0.02	<0.02
Fe	0.04	<0.05	<0.05	< 0.05	8.80	<0.05	< 0.05
Mn	0.02	<0.01	<0.01	<0.01	67.00	47.00	0.02
Tot Hardness	n/s	190.60	98.30	59.70	6081.10	5126.90	69.60
Ca Hardness	n/s	68.30	49.30	28.30	1589.70	1564.20	29.60
Mg Hardness	n/s	122.30	48.90	31.40	4491.40	3562.70	40.00
B	n/s	0.01	< 0.005	< 0.005	0.03	0.37	< 0.005
Si	n/s	6.80	5.40	4.70	25.00	2.10	< 1
SS	n/s	38.00	60.00	28.00	< 21	82.00	34.00
Bicarbonate	n/s	300.00	140.00	60.00	<12	240.00	140.00
Nitrate as NO ₃	0.24	1.30	0.25	0.49	0.60	<0.1	<0.1
NH ₃	n/s	0.04	<0.012	<0.012	0.55	2.00	2.20
Nitrite as NO ₂	0.24	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Zimbutu Quarterly Monitoring									
Parameters	Mean Ambient Surface Water	Pit 4	Buffalo U/S	Buffalo D/S	Buffalo B/C	VN 4	VN 8	Weir 8C	Dorp to Buffels
		Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26
pH	6.0 - 9.0	7.70	7.50	7.30	7.10	7.70	7.70	Dry	8.20
EC mS/m	19.6	180.00	20.00	25.00	24.00	430.00	670.00		42.00
TDS	122	1800.00	92.00	150.00	150.00	3900.00	7100.00		270.00
Ca	16.33	160.00	13.00	13.00	14.00	570.00	790.00		28.00
Mg	9.98	160.00	8.10	8.00	9.20	350.00	690.00		18.00
Na	6.8	58.00	17.00	17.00	19.00	170.00	470.00		24.00
K	0.26	25.00	3.50	2.50	2.90	27.00	57.00		1.40
M Alk	n/s	160.00	60.00	60.00	60.00	230.00	190.00		140.00
Cl	7.6	12.00	8.00	9.30	8.60	3.70	36.00		8.00
SO ₄	9.5	1100.00	36.00	36.00	35.00	2400.00	4600.00		74.00
F	0.04	0.81	0.12	0.17	0.07	0.53	0.78		0.25
Al	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02
Fe	0.04	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05		<0.05
Mn	0.02	< 0.01	< 0.01	<0.01	<0.01	0.22	<0.01		<0.01
Tot Hardness	n/s	1053.60	64.80	64.30	73.40	2876.80	4805.10		143.80
Ca Hardness	n/s	400.40	31.70	31.20	35.70	1434.80	1972.10		71.10
Mg Hardness	n/s	653.20	33.20	33.10	37.70	1442.00	2832.90		72.70
B	n/s	< 0.005	0.01	< 0.005	0.01	0.01	0.01		< 0.005
Si	n/s	8.00	5.30	5.20	6.20	8.20	5.80		5.70
SS	n/s	< 21	62.00	150.00	78.00	< 21	< 21		54.00
Bicarbonate	n/s	160.00	60.00	60.00	60.00	230.00	190.00		140.00
Nitrate as NO ₃	0.24	<0.1	4.70	5.80	6.00	< 0.1	<0.1		0.48
NH ₃	n/s	0.10	<0.012	<0.012	<0.012	0.02	0.33		<0.012
Nitrite as NO ₂	0.24	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5

BALLENGEICH SURFACE WATER MONITORING										
Parameters	Horn and Ngagane Quality Objectives	SW1			SW4			SW6		
		Feb-26	Mar-26	Apr-26	Feb-26	Mar-26	Apr-26	Feb-26	Mar-26	Apr-26
pH	6.5 - 8.4	7.5	7.7	7.7	7.2	7.4	7.4	7.1	7.3	7.3
EC mS/m	< 40	17	27	19	23	40	30	26	38	31
TDS	< 260	120	160	150	160	370	250	190	250	250
Ca	< 32	13	21	13	17	32	20	18	25	21
Mg	< 30	8.7	13	7.8	12	18	13	14	18	14
Na	< 70	6.8	7	6.3	11	11	12	11	12	12
K	< 50	2	1.3	1.2	2.1	1.8	1.6	3	1.2	1.8
M Alk	n/s	40	60	40	50	50	45	45	50	40
Cl	< 100	5.2	4.8	3.1	5.6	5.3	3.7	6.6	5.1	3.8
SO ₄	< 200	36	70	37	68	150	84	79	130	91
F	< 0.75	0.1	0.07	0.05	0.09	0.06	0.06	0.09	0.1	0.06
Al	n/s	<0.02	<0.02	< 0.02	<0.02	<0.02	<0.02	<0.02	<0.02	< 0.02
Fe	n/s	0.06	0.09	0.07	< 0.05	<0.05	< 0.05	<0.05	< 0.05	< 0.05
Mn	n/s	< 0.01	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	<0.01
Tot Hardness	n/s	67.3	107.2	64.9	94	154.1	102	104	138.6	108.8
Ca Hardness	n/s	31.4	52.8	32.9	42.7	79.5	49.9	45.6	62.7	51.6
Mg Hardness	n/s	35.9	54.4	32	51.3	74.5	52.2	58.4	75.9	57.2
B	n/s	<0.005	< 0.005	< 0.005	<0.005	< 0.005	< 0.005	<0.005	0.005	< 0.005
Si	n/s	4.7	4.2	5.3	4.7	4	5.4	4.6	4.3	5.3
SS	< 50	< 21	< 21	26	80	58	52	58	< 21	42
Bicarbonate	n/s	40	60	40	50	50	45	45	50	40
Nitrate as NO ₃	n/s	1.40	0.63	1.20	1.50	0.67	1.40	1.20	0.69	1.60
NH ₃	< 0.007	0.015	< 0.012	< 0.012	0.015	0.035	<0.012	0.18	<0.012	<0.012
Nitrite as NO ₂	n/s	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

BALLENGEICH SURFACE WATER MONITORING													
Parameters	Horn and Ngagane Quality Objectives	SW9			SW10			Ingagane US			Ingagane DS		
		Feb-26	Mar-26	Apr-26	Feb-26	Mar-26	Apr-26	Feb-26	Mar-26	Apr-26	Feb-26	Mar-26	Apr-26
pH	6.5 - 8.4	7.3	7.4	7.5	7.3	7.3	7.1	7.6	7.6	7.2	7.4	7.6	7.3
EC mS/m	< 40	28	29	31	27	31	28	26	29	30	31	35	35
TDS	< 260	200	250	280	180	220	220	190	230	200	230	280	270
Ca	< 32	14	14	15	15	16	13	12	13	17	17	18	24
Mg	< 30	9.2	8.6	9	10	10	9.1	8.4	8.2	8.9	11	11	13
Na	< 70	27	24	33	24	23	23	27	24	33	31	26	32
K	< 50	3	1.5	2.7	3.1	1.7	1.9	3	2.5	3.4	3	1.5	4
M Alk	n/s	40	50	50	60	50	70	50	60	50	55	50	50
Cl	< 100	10	8.8	8.6	10	8.7	4.3	10	9.9	8.7	12	10	9.4
SO ₄	< 200	74	77	76	73	84	46	68	68	73	88	97	91
F	< 0.75	0.13	0.09	0.08	0.13	0.1	0.08	0.12	0.13	0.07	0.14	0.11	0.08
Al	n/s	<0.02	<0.02	< 0.02	<0.02	<0.02	< 0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fe	n/s	<0.05	< 0.05	< 0.05	<0.05	< 0.05	< 0.05	<0.05	< 0.05	<0.05	<0.05	< 0.05	<0.05
Mn	n/s	< 0.01	<0.01	<0.01	< 0.01	<0.01	<0.01	< 0.01	0.03	<0.01	< 0.01	<0.01	<0.01
Tot Hardness	n/s	72.8	70.7	75.1	78.5	82	70.6	65.4	65.5	79.5	88.3	90.4	112
Ca Hardness	n/s	34.9	35.4	38	36.7	40.2	33.1	30.9	31.8	42.8	41.6	44.6	60.5
Mg Hardness	n/s	37.9	35.3	37.1	41.8	41.7	37.5	34.6	33.7	36.7	46.6	45.8	51.5
B	n/s	<0.005	0.009	< 0.005	<0.005	0.007	< 0.005	<0.005	0.006	<0.005	<0.005	0.009	<0.005
Si	n/s	3.7	3.1	4.3	3.9	3.2	10	3.6	3	5.8	4	3.2	6.4
SS	< 50	72	28	28	66	96	140	< 21	110	72	72	62	54
Bicarbonate	n/s	40	50	50	60	50	70	50	60	50	55	50	50
Nitrate as NO ₃	n/s	1.50	0.99	1.10	1.60	0.58	0.78	1.50	1.70	0.96	1.60	0.47	1.60
NH ₃	< 0.007	< 0.012	< 0.012	<0.012	< 0.012	< 0.012	<0.012	< 0.012	< 0.012	0.027	0.015	< 0.012	<0.012
Nitrite as NO ₂	n/s	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Parameters	Horn and Ngagane Quality Objectives	SW2	SW3	SW3(1)	SW5	SW7	VN 3	VN5	VN 11
		Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26
pH	6.5 - 8.4	7.5	Dry	2.3	2.6	2.6	6.8	6.8	7.3
EC mS/m	< 40	21		950	550	560	780	30	22
TDS	< 260	180		3500	4300	4500	7600	230	160
Ca	< 32	14		660	460	580	640	21	21
Mg	< 30	8.8		840	260	350	520	12	11
Na	< 70	6.4		360	230	390	1100	11	7.8
K	< 50	1.3		2.6	20	23	110	1.8	1.4
M Alk	n/s	40		<12	<12	<12	130	50	50
Cl	< 100	2.9		22	39	40	140	3.7	2.8
SO ₄	< 200	43		7500	2800	3000	4300	88	48
F	< 0.75	0.05		1.8	0.08	0.11	0.24	0.05	< 0.05
Al	n/s	0.02		430	110	130	<0.02	< 0.02	<0.02
Fe	n/s	0.1		510	31	48	<0.05	< 0.05	< 0.05
Mn	n/s	<0.01		64	16	20	0.83	<0.01	<0.01
Tot Hardness	n/s	72.3		5085.8	2217.1	2890.8	3727	103.5	98.2
Ca Hardness	n/s	36.1		1637.4	1148.8	1442.6	1590	52.6	51.4
Mg Hardness	n/s	36.2		3448.3	1068.3	1448.2	2137.1	50.9	46.8
B	n/s	< 0.005		0.32	0.051	0.13	0.11	< 0.005	<0.005
Si	n/s	5.4		38	15	28	3.8	4.9	8.7
SS	< 50	< 21		44	< 21	< 21	42	< 21	26
Bicarbonate	n/s	40		<12	<12	<12	130	50	50
Nitrate as NO ₃	n/s	1.30		0.31	0.30	<0.1	<0.1	1.50	1.20
NH ₃	< 0.007	<0.012		8.5	6.1	6.3	0.88	<0.012	<0.012
Nitrite as NO ₂	n/s	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

LONGRIDGE SURFACE WATER MONITORING										
Parameters	DWA SAWQTV Drinking Water	LRVN1	LRVN2	LRVN3	LRVN4	LRVN5	LRVN6	LRVN7	LRVN8	LRVN9
		Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26
pH	6.0 - 9.0	No Access	7.5	8	7.7	7.7	8	7.3	7.6	8.1
EC mS/m	< 70		48	81	48	210	100	110	51	26
TDS	< 450		370	580	270	2000	810	870	380	190
Ca	< 32		60	110	15	380	120	130	54	7.7
Mg	< 30		11	19	1.3	37	21	32	11	1.6
Na	<100		12	20	82	190	52	47	28	40
K	< 50		1.1	2.7	2.7	14	3.5	1.2	2.5	2.1
M Alk	n/s		65	160	200	220	100	50	70	100
Cl	< 100		<12	<12	<12	<12	<12	<12	<12	<12
SO ₄	< 200		150	250	23	1000	400	500	150	14
F	< 1		< 0.05	0.06	1.4	0.19	0.07	< 0.05	< 0.05	0.62
Al	< 0.15		<0.02	<0.02	<0.02	< 0.02	< 0.02	<0.02	<0.02	0.05
Fe	< 0.1		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05
Mn	< 0.05		0.04	<0.01	0.08	0.03	0.07	0.35	<0.01	<0.01
Tot Hardness	n/s		195	359	42.4	1114.2	394.6	462.3	179.2	25.8
CaHardness	n/s		148.7	279.7	36.9	959.8	307.4	331.3	135.8	19.3
MgHardness	n/s		46.3	79.4	5.5	154.4	87.2	131	43.4	6.6
B	n/s		< 0.005	0.006	0.023	0.064	0.015	< 0.005	0.007	0.011
Si	n/s		3.5	2.9	5.7	4.5	3.7	1.9	2.7	4.3
SS	n/s		< 21	<21	< 21	< 21	< 21	5900	<21	< 21
Bicarbonate	n/s		65	160	200	220	100	50	70	100
Nitrate as NO ₃	n/s		0.61	0.13	< 0.1	1.00	0.67	0.15	< 0.1	0.83
NH ₃	n/s		<0.012	<0.012	0.39	< 0.012	<0.012	< 0.012	<0.012	<0.012
Nitrite as NO ₂	n/s		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Smithies Dump Quarterly Monitoring									
Parameters	DWA SAWQTV Drinking Water	D1	D2	D3	S3	S4	S5	S6	S 7
		Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26
pH	6.0 - 9.0	7.8	7.4	7	2.8	3.4	Dry	2.5	2.6
EC mS/m	< 70	35	20	32	360	270		830	690
TDS	< 450	230	150	180	2900	2300		14000	9200
Ca	< 32	35	13	22	270	270		750	570
Mg	< 30	20	8.6	15	220	150		880	680
Na	<100	19	9.4	19	59	55		100	97
K	< 50	6.6	4.9	8.3	8.2	7.8		9.8	6.1
M Alk	n/s	160	80	120	<12	<12		<12	<12
Cl	< 100	13	6.5	14	15	16		12	24
SO ₄	< 200	8.5	7.2	4.4	1900	1500		8100	5700
F	< 1	0.08	0.1	0.1	0.23	0.52		2.7	1.3
Al	< 0.15	<0.02	<0.02	<0.02	210	160		1000	700
Fe	< 0.1	<0.05	<0.05	<0.05	32	1.2		700	300
Mn	< 0.05	<0.01	<0.01	<0.01	24	23		75	54
Tot Hardness	n/s	171.3	68.3	116.2	1565.9	1268.6		5467.2	4193.3
CaHardness	n/s	88.3	32.8	54.4	671.6	665.9		1860.7	1412.6
MgHardness	n/s	83	35.5	61.8	894.4	602.7		3606.4	2780.7
B	n/s	<0.005	<0.005	0.011	0.39	0.28		1.1	0.75
Si	n/s	2	6.6	1.8	46	41		72	54
SS	n/s	< 21	26	22	38	<21		< 21	< 21
Bicarbonate	n/s	160	80	120	<12	<12		<12	<12
Nitrate as NO ₃	n/s	<0.1	1.10	< 0.1	<0.1	< 0.1		0.73	0.40
NH ₃	n/s	<0.012	< 0.012	< 0.012	5.2	2.5		0.83	10
Nitrite as NO ₂	n/s	< 0.5	<0.5	4.10	<0.5	<0.5		<0.5	<0.5

NATAL AMMONIA SURFACE WATER QUALITY											
Parameters	DWA SAWQTV Drinking Water	Alpha	House VN	Nongoma	Pump VN	VN Waterfall	West of Dump Stream	Mount Ngwibi VN1	Mount Ngwibi VN2	Mount Ngwibi VN3	Mount Ngwibi VN4
		Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26	Apr-26
pH	6.0 - 9.0	8.3	8.1	7.8	7.9	Temporary stopped from sampling	Temporary stopped from sampling	Temporary stopped from sampling	Temporary stopped from sampling	Temporary stopped from sampling	Temporary stopped from sampling
EC mS/m	< 70	54	67	40	60						
TDS	< 450	450	540	270	470						
Ca	< 32	62	120	45	96						
Mg	< 30	13	19	20	12						
Na	<100	51	14	18	34						
K	< 50	3.8	2.7	2.9	4.7						
M Alk	n/s	95	120	65	80						
Cl	< 100	4.5	3.8	9.5	3.1						
SO ₄	< 200	180	240	120	240						
F	< 1	0.21	0.23	0.16	0.05						
Al	< 0.15	<0.02	<0.02	<0.02	<0.02						
Fe	< 0.1	<0.05	<0.05	<0.05	<0.05						
Mn	< 0.05	<0.01	0.05	<0.01	<0.01						
Tot Hardness	n/s	206.9	378.6	193.5	291.2						
CaHardness	n/s	153.7	298.9	111.2	240.3						
MgHardness	n/s	53.2	79.7	82.4	50.9						
B	n/s	0.012	0.008	0.009	0.014						
Si	n/s	8.1	8.8	9	9.1						
SS	n/s	< 21	48	< 21	<21						
Bicarbonate	n/s	95	120	65	80						
Nitrate as NO ₃	n/s	0.18	< 0.1	0.28	0.46						
NH ₃	n/s	<0.012	<0.012	<0.012	<0.012						
Nitrite as NO ₂	n/s	<0.5	<0.5	<0.5	<0.5						

Drinking Water Quality			
Parameters	South African Water Quality Standard	South African National Standards	GWO
	DWA SAWQTV Drinking Water	SANS 241-1:2015	Apr-26
pH	≥ 6 to ≤ 9	≥ 5.0 to ≤ 9.7	7.4
EC	< 70	< 170	99
TDS	< 450	< 1200	550
Ca	< 32	NS	40
Mg	< 30	NS	22.0
Na	< 100	NS	180.0
K	< 50	NS	7.2
T Alk	NS	NS	260.0
Cl	< 100	< 300	73
SO ₄	< 200	< 250	140.0
F	< 1	< 1.5	1.100
Al	< 0.15	< 0.3	<0.02
Fe	< 0.1	< 0.3	<0.05
Mn	< 0.05	< 0.1	0.070
Tot Hardness	NS	NS	189.2
E.coli per100ml	0	0	ND
B	NS	< 2.4	0.035
Si	NS	NS	13
SS	NS	NS	< 21
T.coliform per100ml	≤10	< 10	ND
Bicarbalk CaCO ₃ /L	NS	NS	260
NO ₃	< 26.56	< 11	2.6
NH ₃	< 1.22	< 1.5	<0.012
NO ₂	< 3.28	< 0.9	<0.5

APPENDIX F: WATER QUALITY GRAPH

