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11 June 2025

To whom it may concern

SUBJECT: HYDROPEDOLOGY STATEMENT FOR THE PROPOSED SAVUKA 5A, 5B, 7A & 7B TAILINGS STORAGE FACILITIES HEIGHT EXTENSION PROJECT.

Dear Sir / Madam,

The Biodiversity Company has been commissioned to provide a hydropedology statement in support of the Water Use License (WUL) and amendment processes for the proposed Savuka 7a & 7b Tailings Storage Facility (TSF) height extension project. The proposed project indicates that the Savuka 5a, 5b, 7a & 7b TSF are nearing their final approved height, and the current planned life of the mine in the West Wits region surpasses the available deposition capacity of these TSFs. The Savuka TSF is situated in close proximity to Carletonville, Merafong Local Municipality, West Rand District Municipality, Gauteng Province. This statement pertains to the relevance of hydropedology, and any associated risks towards the adjacent watercourses.

The previously site land type data (Land Type Survey Staff, 1972 - 2006) confirmed the hillslopes transects and the modelled conceptual models of delineated soil hydropedological groups resources in the catchment with the proposed Tailings Storage Facilities (TSFs), as presented in Figure 1. Two main hillslope hydropedological patterns were identified which are applicable to the catchment of influence with the proposed development (see Table 1). The first hydropedological pattern has recharge (Shallow) soils from the crest to the lower mid-slope section transecting to a responsive (saturated) hydropedological soil type at the valley bottom. The second hydropedological pattern has recharge (Shallow) soils from the crest to the mid-slope section transecting to recharge (deep) then a responsive (saturated) hydropedological soil type at the valley bottom merging to a watercourse.

Several model exercises were undertaken to determine the catchment extent of the sub-basin for the wetlands (Figure 2) associated with the project area. These models indicate minimal impacts are expected. The site is in a land type commonly associated with shallow recharge hydropedological soils groups (Glenrosa and Mispah), recharge (deep) hydropedological types (Hutton soil forms) and responsive saturated hydropedological types (Rensburg) see Figure 2 and Table 1. It is worth considering the source of water associated with the moisture content within the watercourse.

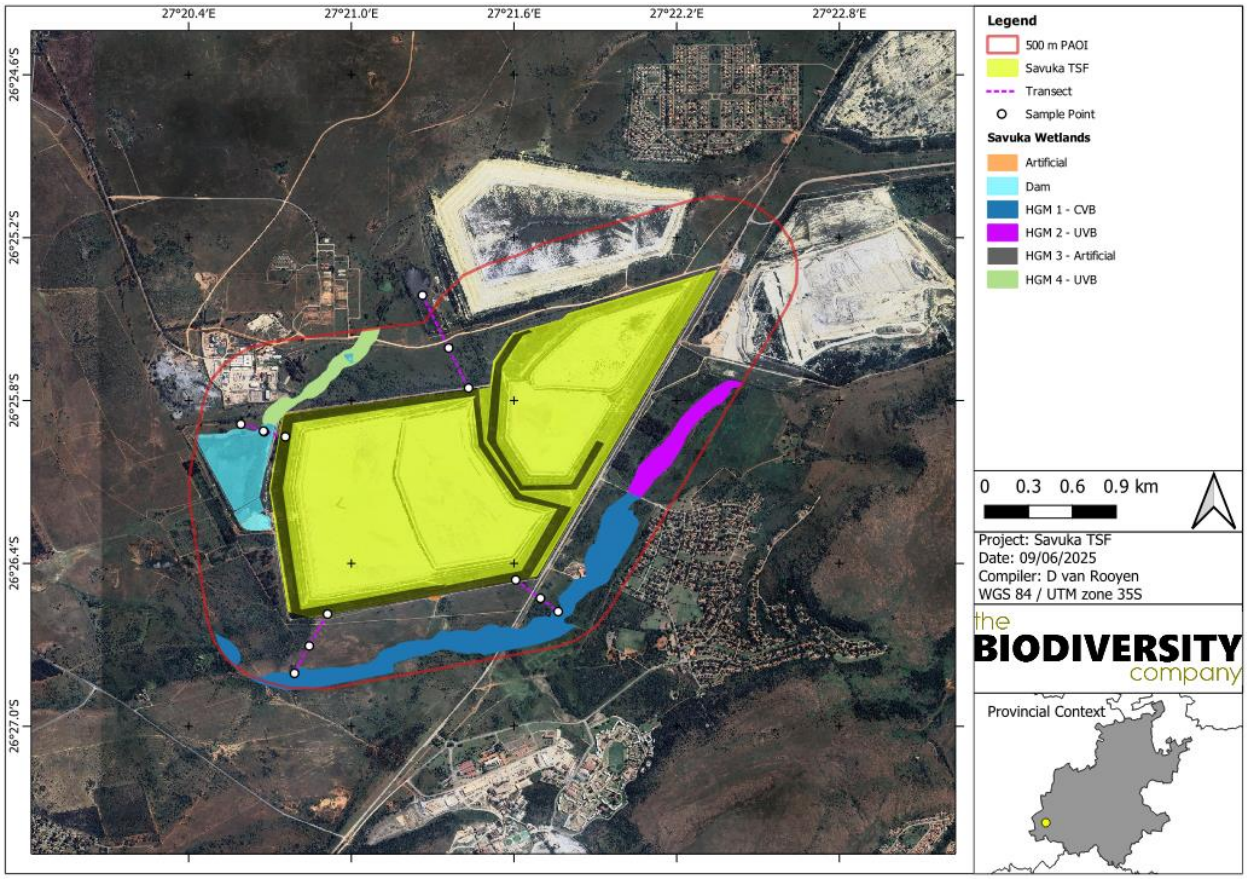

Figure 1 **The assessed hillslope transects hydropedological patterns regarding the Savuka TSF height extension Project.**

Table 1 **Hydropedological patterns for the Savuka TSF height extension Project.**

Hydropedological hillslope patterns	
Hillslope Transect	**Hydropedological patterns**
H1	Recharge (Shallow) - Recharge (Shallow) - Responsive (Saturated)
H2	Recharge (Shallow) - Recharge (Deep) - Responsive (Saturated)

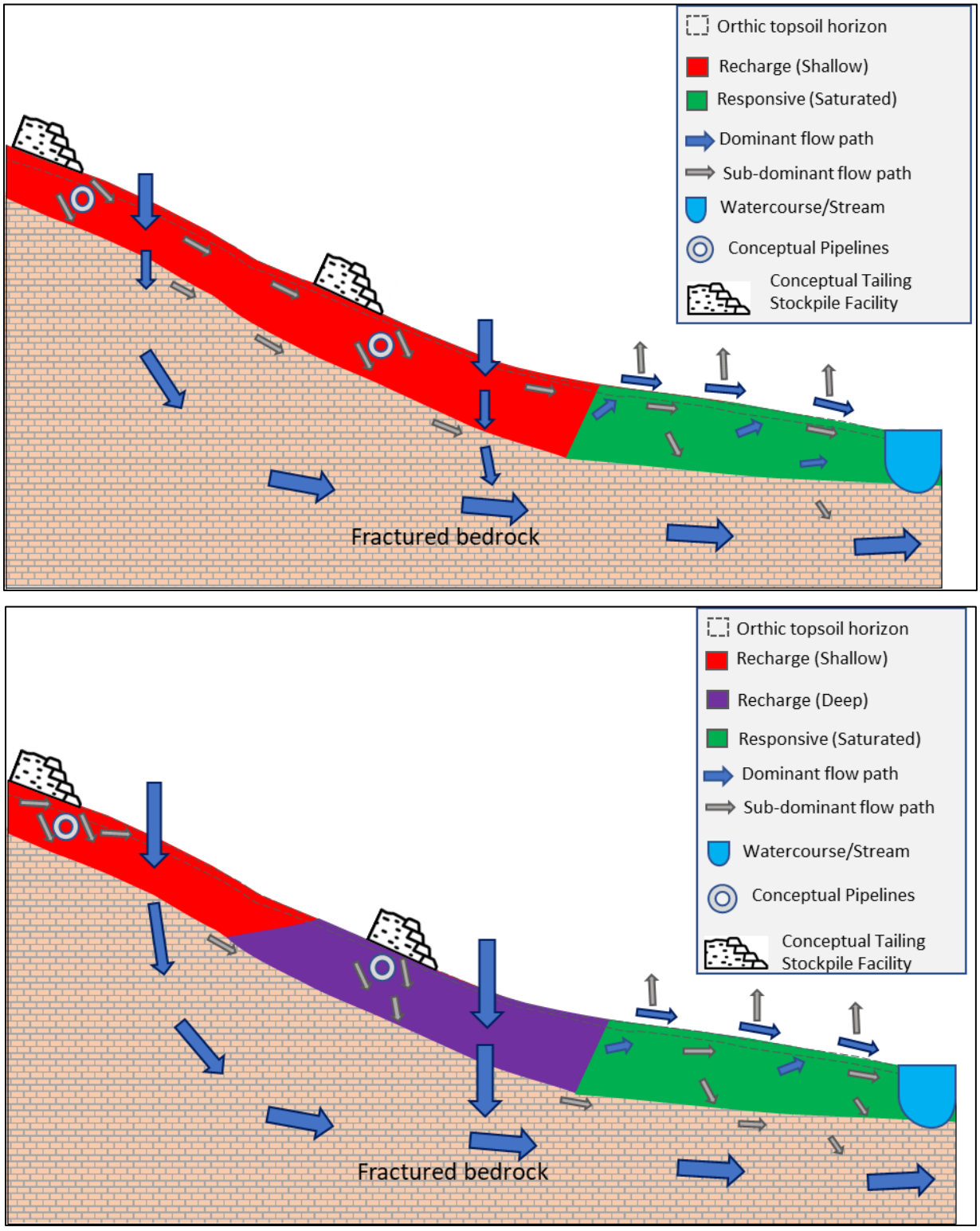

Figure 2 **The Conceptual hydropedological flows after the Savuka TSFs extension project.**

The reach of the water resources adjacent to the proposed Savuka TSFs extension and associated infrastructure derives most water flows from the catchments north-east and north, which are characterised with recharge (Shallow and deep). This indicates that surface and also subsurface recharge flows are predominantly responsible for the level of moisture in the watercourses. Extension of the Savuka TSFs will have an acceptable impact on the recharge and lateral soils in proximity to the site`s catchment as dominant vertical and sub-dominant lateral flows towards the water table recharge stores (shallow and deep recharge) will be minimally impeded see Figure *2*. Limited impacts can also be expected where the expansion of the TSFs intercept the hillslopes with lateral flows. Flow impediments due to impermeable layers can occur promoting surface return flows. Usually, flow changes in the hillslopes will respond to vertical flow paths still recharging the catchment water stores sufficiently. It is however worth-noting that, even though the impact is minimal, due to the presences of vertic topsoils, lateral flows from the interflow (A/B) soils (Arcadia soil form) associated with the project area should also be properly managed. This can minimise surface return flows or drainage problems which commonly promote loss of water as surface run-off or evaporation demands increasing the total catchment deductible water losses. The areas with responsive saturated soils (i.e., Rensburg soil forms) mostly associated with saturation or wetlands in the project area will be avoided.

When comparing the size of the project area with that of the combined sub-basins responsible for providing moisture content to the wetland systems, it is clear that the potential worst-case scenario loss of moisture to the wetland is approximately < 2% of the total water regime on a catchment scale. Therefore, when considering a percentage loss of total streamflow and groundwater recharges, negligible losses are expected, predominantly due to the fact that the bulk of the moisture and waterflows already originates well upstream of the project area and around the catchment.

The planned plantation is intended as a passive mitigation measure to reduce potential groundwater contamination by promoting evapotranspiration and uptake of water potentially carrying contaminants. The establishment of deep-rooted, water-demanding vegetation (e.g. eucalyptus or similar species, if applicable) will enhance vertical water uptake from the vadose zone, thereby reducing percolation and potential contaminant transport toward the groundwater table.

From a hydropedological perspective, the plantation is not expected to negatively affect the regional water balance or the functioning of adjacent wetlands and watercourses. This is due to:

- The dominant **recharge-type soils** (Glenrosa, Mispah, Hutton) which promote vertical infiltration and are well-drained.
- The **limited lateral connectivity** between the plantation zones and watercourses, as responsive (saturated) soil zones (e.g. Rensburg) are being avoided.
- The **plantation area being minor in size** relative to the catchment, thus its evapotranspirative draw will not significantly impact the baseflow or moisture availability in surrounding hydropedological units.

Therefore, the plantation enhances groundwater protection while having a negligible impact on the overall site hydrology.

The existing TSFs, particularly compartments 7A and 7B, currently contribute minimally to catchment hydrology through limited lateral seepage and episodic surface runoff during rainfall events, which are largely managed via engineered containment systems. These contributions are constrained by the dominant hydropedological setting, which is characterised by vertical recharge patterns through well-drained soils such as Glenrosa and Hutton. The proposed height extension of these TSFs is not anticipated to significantly alter this status. Catchment-scale modelling confirms that the overall impact on water regime stores is negligible, with potential losses accounting for < 2% of the total catchment water budget. Importantly, the footprint expansion avoids responsive saturated zones, and the hydropedological flow regime, particularly vertical infiltration, remains largely intact. Consequently, the TSF height extension will not materially affect the subsurface or surface water contributions to adjacent watercourses, provided that current seepage and stormwater controls are maintained.

Therefore, it is the specialist's opinion that the proposed Savuka TSF height extension project and associated infrastructure will not result in a significant loss of total streamflow and groundwater recharge water regime stores. It is therefore recommended that the proposed activities proceed as have been planned and no further hydropedology assessments are necessary.

Regards,

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