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To whom it may concern

**SUBJECT: HYDROPEDELOGY STATEMENT FOR THE PROPOSED MV LINE IN 42ND HILL HARRISMITH PROJECT.**

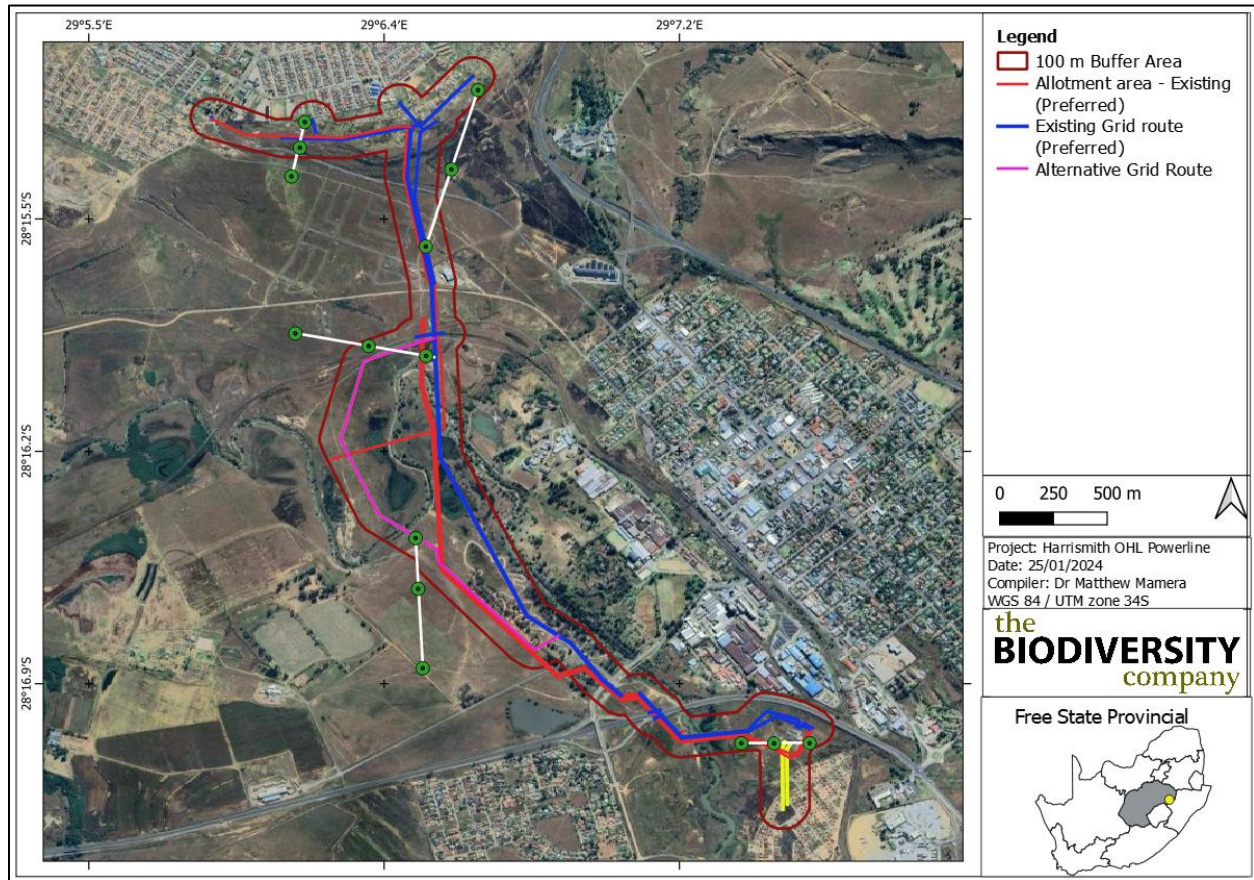
Dear Sir / Madam,

The Biodiversity Company has been commissioned to provide a hydrogeology statement in support of the Water Use License (WUL) process for the proposed MV Line in 42nd Hill Harrismith and associated electrical infrastructure. The project is located in the Intabazwe area in Harrismith. The project area with the proposed grid routes upgrade and alternative grid route, stretches across the N3 national road, approximately 2.4 km west of the N3 national road, also located 19. km northwest of the town of Swinburne and 29.6 km northwest of the Van Reenen town, Free State Province. The proposed construction includes upgrading the existing municipal medium voltage (132/11kV) powerlines, both the 1 hydroxymethylfural (HMF) and 2 HMF from Harrismith Municipal Substation to the 42nd Hill residential area, extending the line to 1HMF and 2HMF, splitting feeders, as well as upgrading the conductors from Hare grade conductor to Chickadee grade to increase their supply capacity for the Letsatsi development. The existing municipal network supplies 42nd Hill with a 7.4 MVA load. The powerline will be constructed by using 300m wood structures as well as cement structures, and additional poles will be added to ensure sufficient ground clearance.. The existing network supplies 42nd Hill with a 7.4 MVA load. The powerline will be constructed by using 300m wood structures as well as cement structures, and additional poles will be added to ensure sufficient ground clearance. The proposed plan is to split the 1HMF and 2HMF into 3 feeders to accommodate 2520 new stands. This statement pertains to the relevance of hydrogeology, and any associated risks towards the adjacent watercourses.

Several model exercises were undertaken to determine the catchment extent of the sub-basin for the wetlands (Figure 2 a) associated with the project area as well as the Wilge and Nuwejaarspruit rivers (Figure 2 b) in proximity to the project boundary. These models indicate minimal to no impacts are expected. The site is in a land type commonly associated with shallow recharge hydrogeological soils groups (i.e., Glenrosa and Mispah soil forms), interflow (Soil/Bedrock) hydrogeological types (Avalon, Westleigh and Palmiet soil forms), interflow (A/B) hydrogeological soils (i.e. duplex soil like Swartland) and responsive saturated hydrogeological types (Willowbrook and Katspruit) see Figure 2 c-d and Table 1). It is worth considering the source of water associated with the moisture content within the watercourse.

The site inspection confirmed the hillslopes transects and the modelled conceptual models of delineated soil hydrogeological groups resources in the catchment with the proposed grid powerline corridor, as presented in Figure 1. Three main hillslope hydrogeological patterns were identified which are applicable to the catchment of influence with the proposed upgrades (see Table 1). The first hydrogeological pattern has recharge soils from the crest to midslope transecting to inflow (Soil/Bedrock) then changing to a responsive (saturated) hydrogeological type in the valley bottom merging with the water course (river). The second hydrogeological patterns associated to most hillslopes in the project area are characterised with interflow (Soil/Bedrock) hydrogeological type soils from the crest to the mid-slope section transecting to recharge (Deep) then a responsive (saturated) hydrogeological soil type at the valley bottom. The third hydrogeological patterns associated to most hillslopes in the project area are characterised with interflow (Soil/Bedrock) or interflow (A/B) hydrogeological type soils from the crest to the lower mid-slope section transecting to a responsive (saturated) hydrogeological soil type at the valley bottom.



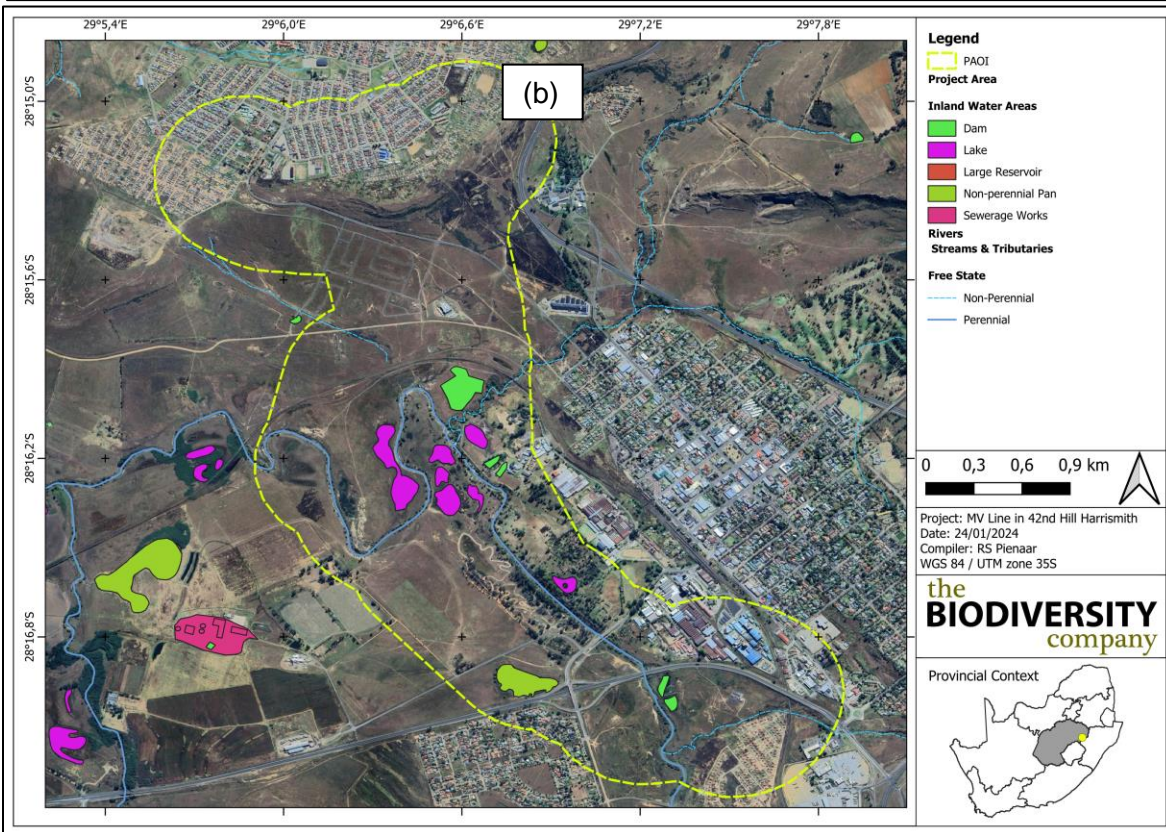
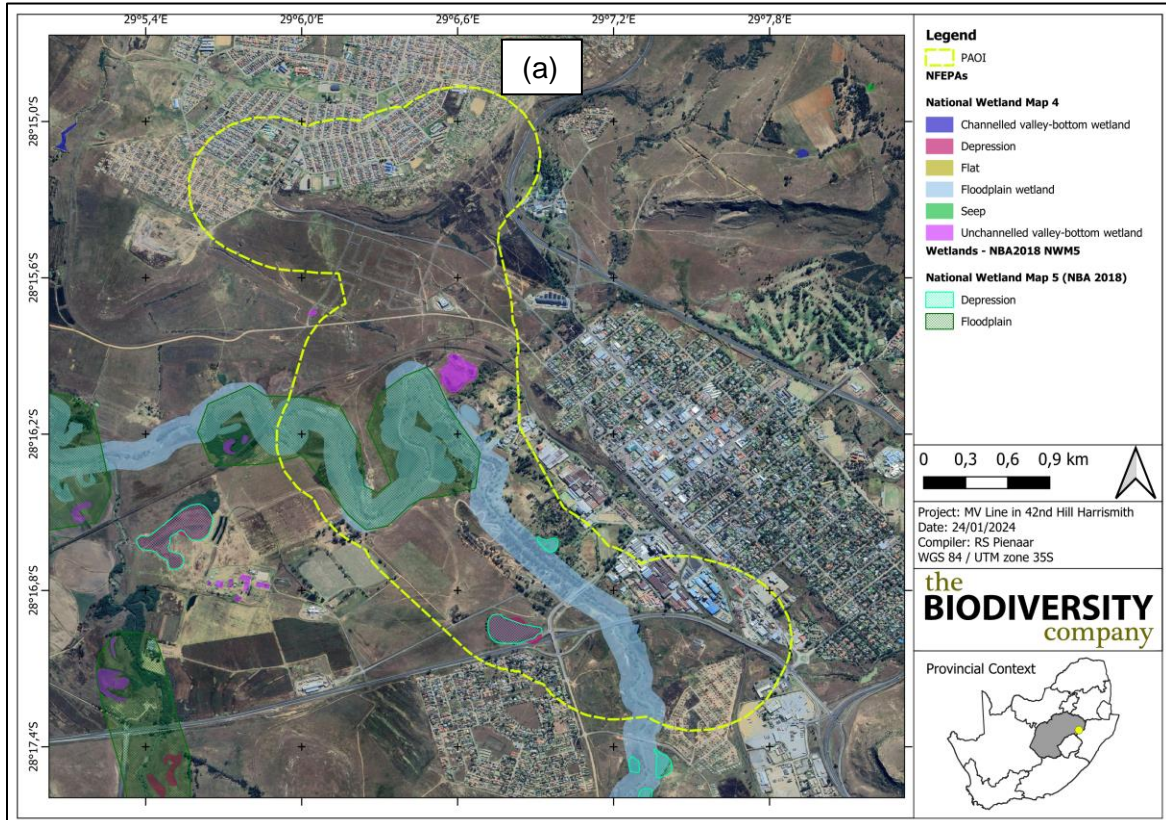


**Figure 1: The assessed hillslope transects hydrogeological patterns in regard to the MV Line in 42nd Hill Harrismith and associated electrical infrastructure Project.**

**Table 1: Hydrogeological patterns for the MV Line in 42nd Hill Harrismith and associated electrical infrastructure Project.**

Hillslope Transect	Hydrogeological hillslope patterns	
	Hydrogeological patterns	
H1	Interflow (Soil/Bedrock) - Recharge (Shallow) - Recharge (deep)	
H2	Recharge (Shallow) - Recharge (shallow) - Recharge (Deep)	
H3	Interflow (Soil/Bedrock) - Interflow (A/B) - Responsive (saturated)	
H4	Interflow (Soil/Bedrock) - Interflow (Soil/Bedrock) - Responsive (saturated)	
H5	Interflow (Soil/Bedrock) - Recharge (Deep) - Responsive (saturated)	





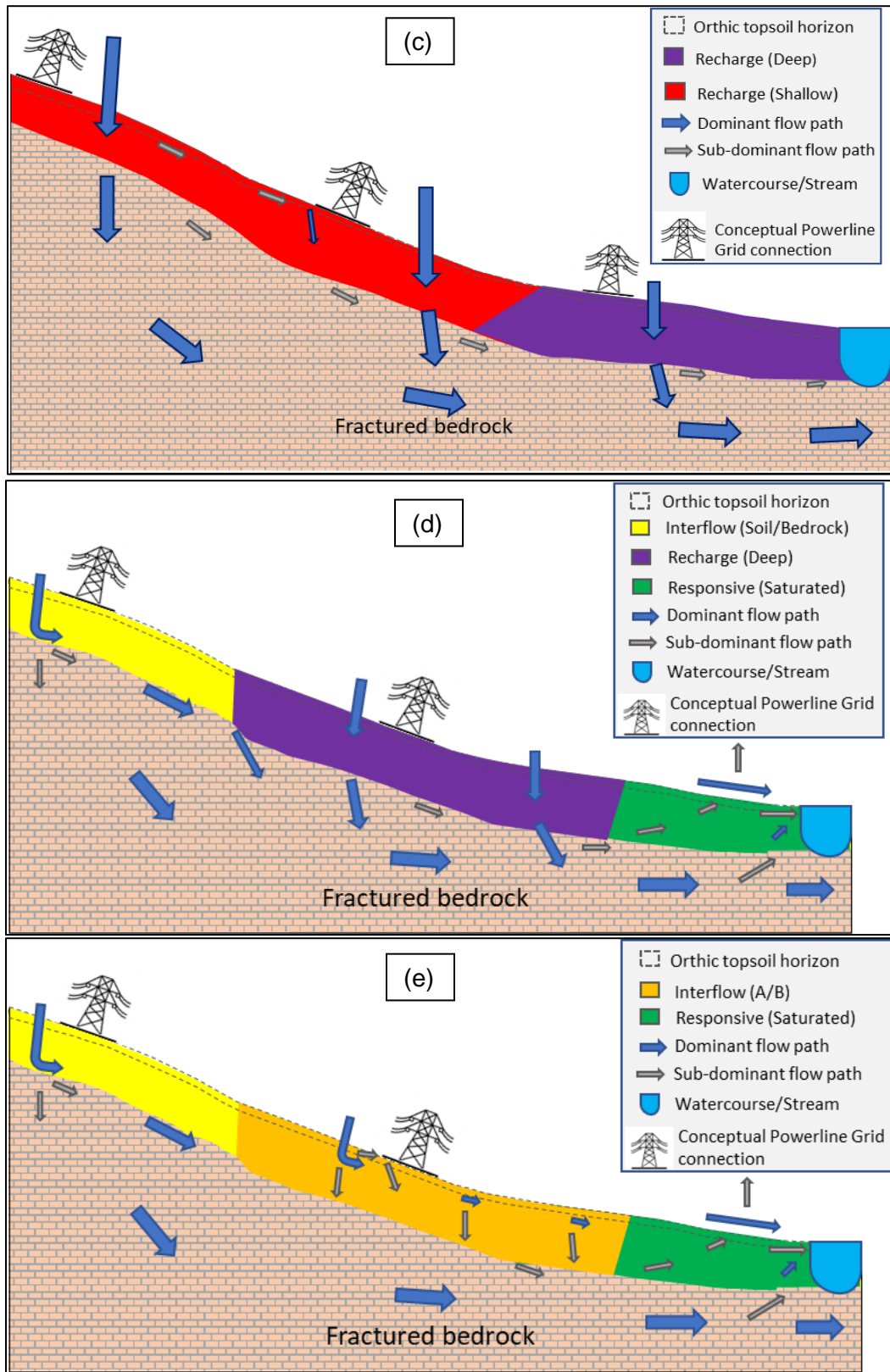


Figure 2 a) The identified wetlands; b) River systems within the catchment hydrogeological water regime basin; and c) Conceptual hydrogeological flows after the grid powerline construction.



Wetlands were identified in the Wilgerivier and Nuwejaarspruit rivers water regime system. The reach of the Wilgerivier and Nuwejaarspruit rivers adjacent to the proposed gridline infrastructure derives most water flows from the catchments north-west and north, which are characterised with recharge (Shallow and deep) soil hydrogeological groups. This indicates that surface and also subsurface recharge flows are predominantly responsible for the level of moisture in the watercourses. Construction of the gridline will have a limited impact on the recharge 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 c-d). Limited impacts can also be expected where the upgrades/construction of the gridline and associated infrastructure intercept the hillslopes with interflow (A/B) and interflow (Soil/Bedrock) associated with lateral flows. Flow impediments due to impermeable layers can occur promoting surface return flows. The 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, lateral flows in the shallow recharge and the interflow (A/B) soils 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., Katspruit and Willowbrook soil forms) mostly associated with wetlands in the project area should be preserved and not used for any developmental activities (pylons location) as such soils acts a water receptor responsible for groundwater stores and recharges.

When comparing the size of the project area with that of the combined sub-basins responsible for providing moisture content to the wetland systems, Wilgerivier and Nuwejaarspruit rivers in the water regime catchment, 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 river's moisture and waterflows already originates well upstream of the project area and around the catchment.

Therefore, it is the specialist's opinion that the proposed MV Line in 42nd Hill Harrismith and associated electrical infrastructure 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 hydrogeology assessments are necessary.

Regards,



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