Specialist Basic Wetland Delineation Assessment report:

Report on the Lesego/Tshatane power line.

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Introduction

This report is to discuss the wetland delineation survey conducted for the project. During the survey, a 100m corridor was investigated along the corridors for the proposed power line (Figure 1). A brief discussion on rivers, streams and drainage lines will be given.

> *According to the National Water Act (Act 36 of 1998) a **wetland** is defined as: land which is transitional between terrestrial and aquatic systems where the water table is usually at o] new the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.*
>
> *In contrast, a river or **watercourse** is defined as: a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows or any collection of water which the Minister may by notice in the Gazette declare to be a watercourse. A reference to a watercourse includes where relevant, its bed and banks.*

Project Description

The brief for the project supplied by DIGES was:

- The proposed construction of ±36 km 132 kV power line from the proposed Tshatane switching substation to the proposed Lesego substation within Fetakgomo and Makhuduthamaga local municipalities of Sekhukhune district, Limpopo Province. Two Alternatives were investigated.
- Construction of the proposed new Tshatane switching substation.
- Construction of the proposed new Lesego substation.

Project Locality:

The study site is north of Jane Furse within Fetakgomo and Makhuduthamaga local municipalities of Sekhukhune district in the Limpopo Province (Figure 1).

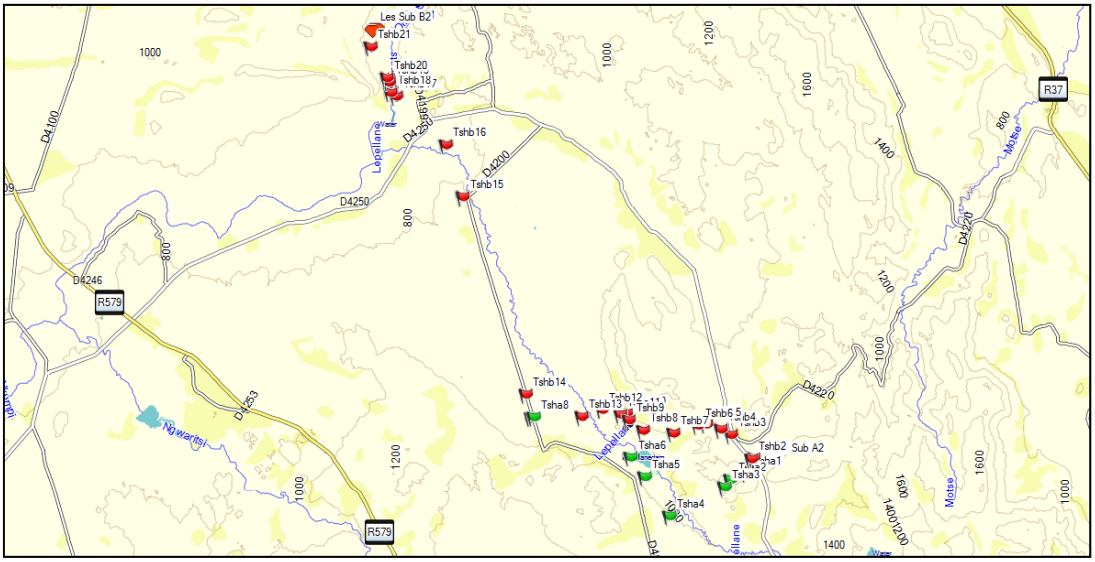

Figure 1: Approximate study site for the new power line – Alternative 1 in green and Alternative 2 in red.

Assumptions and limitations

Availability of baseline information

Sufficient baseline information from maps and NFEPA (2011) was available for the desktop study.

Constraints

The time allocated for the survey was limited. All the different habitats at the site were investigated and it was therefore possible to complete a rapid survey and obtain information on the wetlands and streams associated with the study area.

Bio-physical constraints

Weather conditions during the period were warm with a light wind blowing. The region has received some rainfall prior to the site visit and the vegetation was green and with some standing water present. Nevertheless, the conditions during the survey were ideal for a survey of this nature.

Confidentially constraints

There were no confidentially constraints.

Implications for the study

Apart from the prevailing weather conditions at the site, there were no other significant constraints that would negatively impact upon the study. There is sufficient good quality data available in the literature that partially negates the negative effect that the type of survey had on the quality of the assessment.

Methods

Desktop study

Prior to the site visit and field survey, information of the study site was available. The appropriate 1:50 000 maps were used to identify the major habitat features such as roads, railways, drainage channels, old cultivated fields, wooded areas, wetlands, koppies etc. in the area. Prior to the site visit, the desk top study was conducted to determine if there are any known protected wetland areas are present.

Field survey

The field survey was planned to include all the different habitat types and to target the identified streams and further to look if any other wetted areas are present. During the survey, a walk-about was conducted to investigate the current status of the areas and to determine impacts on the streams along the corridor. Photographs of important features were taken and will be included in the report.

The study area falls into the Water Management Area 4 (MWA 4) associated with the Olifants River. The streams in the study area drain into the Olifants River (quaternary catchment B52A, B52B and B52E). From the NFEPA Atlas (2011), no priority wetlands, rivers or fish sanctuaries are listed for the area.

Results

From the desktop survey, no prominent wetlands were identified. In addition, the routes were covered during the survey to ensure no wetlands are present. Apart from the number of drainage lines and streams, no wetlands were observed along the proposed corridors. Some impoundments are present, but they are all outside the current alignment for the power line alternatives. For the wetland delineation survey, all two alternatives were investigated using a motor cycle to travel the routes (Figure 2 and 3).

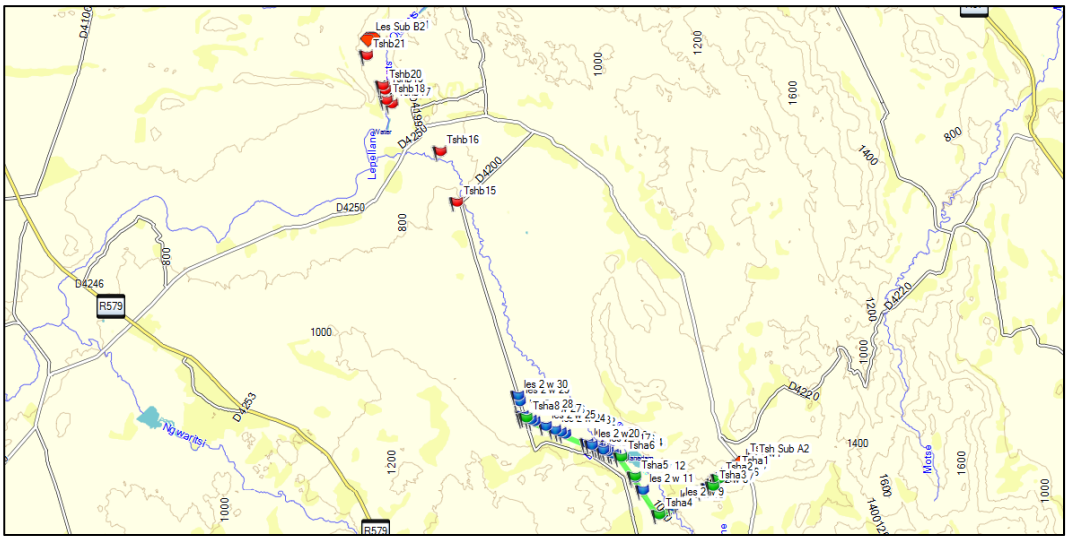

Figure 2: View of Alternative 1 with the drainage line flagged in blue.

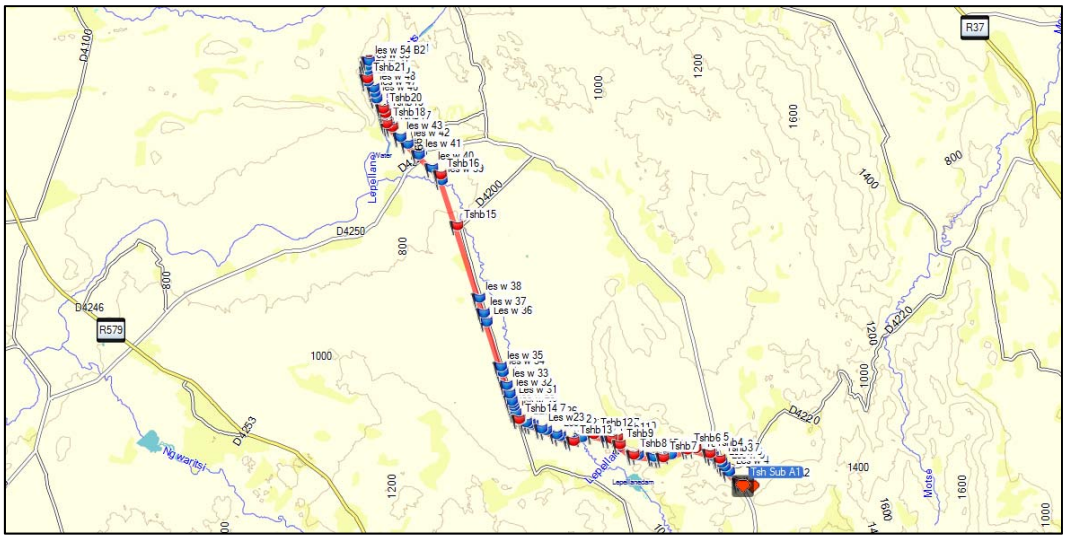

Figure 3: Drainage lines Alternative 2 – note overlap with Alternative 1.

A large number of drainage lines and small streams are present in the area. The impacts on these systems were discussed in the ecological report. Here the impacts and mitigation issues were discussed in detail. In the report, a summary of impacts will be mentioned.

The undulating terrain at the proposed Tshatane substation resulted in serious erosion related to the poor land use practices and most of the drainage lines are modified. The construction of the power line will have an impact if the existing roads are not used. The discussion on the best alternative in the ecological report refers. The low ridge to the south of the substation have areas with severe erosion (northern slopes), but the impacts on the southern slopes are less severe. Here the natural vegetation is in a fair condition, but there is evidence of increased wood harvesting and grazing and this have resulted in increased erosion in the area (Figure 4 – 17).

Figure 4: View of gully near Tshatane sub site.

Figure 5: Grass covered drainage area.

Figure 6: Grass covering preventing erosion.

Figure 7: Grazing and trampling result in erosion on slopes.

Figure 8: Example of erosion near residential areas – southern slope of koppies/ridge.

Figure 9: Example of erosion – increased runoff from hard surfaces.

Figure 10: Erosion in old cultivated areas.

Figure 11: Increased flow velocity from exposed areas increase erosion.

Figure 12: Grazing, cultivation and wood harvesting impacts.

Figure 13: Vegetation intact in koppies – southern slopes.

Figure 14: Some erosion – increased grazing and wood collection on north slopes.

Figure 15: Trampling result in erosion on slopes.

Figure 16: Some areas with boulders lower erosion.

Figure 17: Access along stream bed into koppies – wood collection and sand mining observed.

The area south of the koppies is heavily populated with grazing, cultivation and wood harvesting having a severe negative impact on the natural vegetation. Here the drainage lines around the Lepellane River are eroded and deep gullies are present. This pattern is present for both the alternatives (Figure 18 – 28).

Figure 18: View from koppie south, note erosion gullies due to exposed soils.

Figure 19: Crossing of the Lepellane River – note absence of riparian vegetation.

Figure 20: Modified vegetation – old cultivated lands.

Figure 21: Drainage lines eroded – high flow velocity.

Figure 22: Large areas with modified vegetation on slope.

Figure 23: Some drainage lines with grass cover intact.

Figure 24: Some streams severely eroded – high flow velocity from residential areas and hard surfaces.

Figure 25: Deep gullies – high flow velocities.

Figure 26: Impacts related to the modified vegetation – lack of good riparian zone.

Figure 27: After rains, the grass cover slows down erosion.

Figure 28: Some drainage lines with cover lowering erosion.

East of Ga-Radingwana the landscape is flatter and the impacts are slightly less pronounced. The sections near the Lepellane River where the slopes are steeper are still dominated with severe erosion gullies. Further away from the river, the drainage lines are covered with grass and this helps in lowering the erosion potential. The areas around the villages are of concern again. Here the increased run-off from hard surfaces and streets result in high velocity flows during rain events, resulting in erosion gullies in the area. The higher flows then erode the drainage lines associated with the Lepellane River (Figure 29 – 39).

Figure 29: View of erosion on western bank of the Lepellane River.

Figure 30: East bank – trampling and lack of riparian vegetation obvious.

Figure 31: In flatter areas, lower erosion observed.

Figure 32: New erosion gully forming – run-off from hard surfaces in residential area.

Figure 33: Grass cover prevents erosion in flatter areas.

Figure 34: Heavy grazing, exposed soils and increased velocity (run-off) increase erosion.

Figure 35: Incised stream - increased run-off from roads and residential areas.

Figure 36: Many gullies formed near residential area – increased velocity from run-off.

Figure 37: Even in the flat areas the velocity and cumulative effect from run-off result in increased erosion.

Figure 38: Example of erosion in vegetated area – run-off increase velocity.

Figure 39: Road culverts increase run-off velocity – congested area. Sand mining observed.

South of Ga-Nkoana and Sesesehu, the corridor crosses the Lepellane and Mohlaletsi rivers. Here the increased activities (grazing, cultivation, wood harvesting and sand mining) have a severe negative impact on the two streams. Again the increased run-off from the residential areas and exposed soils in the agricultural areas are responsible for the erosion in the area (Figure 40 – 46).

Figure 40: The drainage lines on the flat areas well vegetated.

Figure 41: Impacts on Lepellane River near residential area.

Figure 42: Erosion gullies associated with increased run-off from hard surfaces.

Figure 43: View of the Mohlaletsi River in Apel.

Figure 44: Small stream draining into the Mohlaletsi River.

Figure 45: Erosion gully formed in the residential area – increased run-off from hard surfaces.

Figure 46: Increased erosion due to residential run-off – Apel.

The impacts at the Olifants River continues as the riparian vegetation is totally removed, resulting in increased erosion of the river banks. North of the Olifants River, slopes are steeper in the valley the water cuts through. The drainage lines to the Lesego substation sites show some erosion. The presence of the many pebbles on the surface does lower the impacts of the increased flow velocity. There is increased grazing pressure and removal of wood is also present. In areas, there are signs of pebble removal and here the erosion has increased (Figure 47 – 53).

Figure 47: View of the Olifants River – devoid of riparian vegetation.

Figure 48: Erosion gully from residential area draining into the Olifants River.

Figure 49: Cultivated fields impacting on drainage lines.

Figure 50: Grassed drainage lines lower erosion impacts.

Figure 51: Overgrazed and trampled areas prone to erosion.

Figure 52: Drainage line in well vegetated area.

Figure 53: Drainage line on steeper slope near Lesego substation.

As mentioned earlier, no wetlands were encountered along the proposed corridors for the new power line to link the Tshatane and Lesego substations. The large number of drainage lines is mostly modified and erosion is present in large parts of the study area. The grazing pressure, wood harvesting and increased flow velocity from hard surfaces in the residential areas are the main problems related to the erosion.

Summary

- Both corridors investigated had a “poor to fair state” with regard to the habitat. Impacts are related to grazing, cultivation, wood harvesting, sand mining, trampling, increased flow velocity and other infrastructure development. The roads and road bridges (culverts) have an impact on all of the drainage lines in the area.
- From a “wetland” perspective, a combination of Alternative 1 and 2 is preferred due to the fact that the existing road can be used for access during construction (see Ecological report for full details).
- It is suggested that the pylons must be placed at least 75m from the larger stream banks and 50m from the erosion gullies. In addition, care must be taken to ensure no pylons are placed in any of the drainage lines. The final positions must be confirmed with the wetland specialist during the walk down study.

References

NFEPA. 2011. National Freshwater Ecosystem Priority Areas. South African National Biodiversity Institute, Pretoria.