Basic Assessment report:

Botanical study for the Silimela/Groblersdal project

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EXECUTIVE SUMMARY

This report is to discuss the botanical survey conducted for the project and the project consists of the following components:

- Construction of approximately 14.5 km of a new 132kV power line that will T-off (Farm Vaalfontein 14JS) from the Silimela substation to the existing Groblersdal Substation.

The proposed power line will be constructed in the area to the northeast of Groblersdal (Elias Motsoaledi Local Municipality, Sekhukhune District Municipality of Limpopo Province, South Africa). Addendum 1 is a summary of impacts, mitigation and management actions suggested. Addendum 2 is a list of the red data plant species found in the broader study area.

Recommendations

- From an ecological perspective the proposed route for the new Silimela/Groblersdal power line is viable. The corridor uses the existing servitude and cut through an area with large current impacts, resulting in lowering the need for the clearing of natural vegetation. Permits for cutting, trimming and removal of *Sclerocarya birrea* must be acquired before clearing of the servitude can commence. A walk down study must be carried out to count and map the protected trees.
- Soils are highly **erodible** and care must be taken during construction to lower the risk of accelerated erosion.
- With careful planning of the construction activity impacts to the sensitive areas (slopes and exposed areas) can be reduced.
- Ensure no oil or fuel spills occur during construction or installation of transformers.
- Prevent and rehabilitate erosion.
- Make sure no wood collection takes place by contractors.

Summary

- The study area investigated had a vegetation cover in a “poor state to fair state” with impacts related to grazing, cultivation, wood collection, settlement development, poor infra-structure maintenance and erosion.
- From an ecological perspective the proposed corridor for the power line is viable. Minimum clearing for this servitude is needed.
- Before any clearing or trimming commences, this specialist must accompany Eskom and the contractors to verify trees to be trimmed or cut.
- *Sclerocarya birrea* is present and the numbers must be counted and mapped once the final route is pegged (walk down study).
- Three red book data plant species is recorded for the area (Addendum 2) but the habitats they prefer is not present along the corridor.
- With regard to biodiversity patterns, little if any impacts will occur.
    - The vegetation type occurs over a very large area and the narrow corridor for the power line will have no large-scale negative impact on it.
    - No red data plant species were noted, as their preferred habitat is not present.
    - Some alien plant infestations were observed on the site or in the near vicinity. Clearing of soil can always lead to some infestations.
    - The activity will have no real impact on biodiversity processes. The only possible impact can be oil or fuel spillages that can occur during construction or the installation and maintenance of the transformers. It is always suggested that fuel and oil must not be stored on site during the construction phase and that containment dams or berms are constructed around transformers. In addition, a clear plan how to manage accidental spills must be included in the EMP for the site.

Assumptions and limitations

Availability of baseline information

Baseline information about the plant community of the site was obtained from Mucina and Rutherford (2006). For the habitat assessment the relevant 1:50 000 maps were used. The desktop survey provided adequate baseline information for the area and therefore this was not a constraint.

Constraints

The survey was conducted during daytime only towards the end of the rainy season. All the different habitat types in the study area was investigated and it was therefore possible to complete a rapid survey and obtain information on the botanical community that is present and the site, or that are likely to occur there.

Bio-physical constraints

Weather conditions during the period were cool with a light wind blowing. The region has received varied rainfall during the summer and the general natural vegetation condition was in a poor to fair condition (some overgrazing was observed). There was no some standing water present along the corridor investigated. This will have obvious implications on the biodiversity that are likely to occur in the area. Nevertheless, the conditions during the survey were suitable 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.

The Environmental Impact Assessment Regulations (Regulation 17 of Government Notice No R354 of 2010), requires that certain information is included in specialist reports. The terms of reference, purpose of the report, methodologies, assumptions and limitations, impact assessment and mitigation (where relevant to the scope of work) and summaries of consultations (where applicable) are included within the main report. Other relevant information is set out below:

Expertise of author:

- Working in the field of ecology since 1996 and in specific vegetation related assessments since 2000.
- Worked in the field of freshwater ecology and wetlands since 2000.
- Is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (Reg. No. 400109/95).
- Has been working with plants indigenous to South Africa since 2004.

Declaration of independence:

BioAssets in an independent consultant and hereby declare that it does not have any financial or other vested interest in the undertaking of the proposed activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998). In addition, remuneration for services provided by BioAssets is not subjected to or based on approval of the proposed project by the relevant authorities responsible for authorising this proposed project.

Disclosure:

BioAssets undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and will provide the competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not.

Based on information provided to BioAssets by the client, and in addition to information obtained during the course of this study, BioAssets present the results and conclusion within the associated document to the best of the author's professional judgement and in accordance with best practise.

_____ 23 July 2015

Dr Wynand Vlok Date

INTRODUCTION

This report is to discuss the botanical survey conducted for the project (Figure 1).

The project consists of the following components:

- Construction of approximately 10.3 km of a new 132kV power line that will T-off (Farm Vaalfontein 14JS) from the Silimela power line to the existing Groblersdal Substation.

Project locality

The proposed power line will be constructed in the area to the northeast of Groblersdal (Elias Motsoaledi Local Municipality, Sekhukhune District Municipality of Limpopo Province, South Africa) (Figure 1).

Addendum 1 is a summary of impacts, mitigation and management action suggested. Addendum 2 is a list of the red data plant species found in the broader study area.

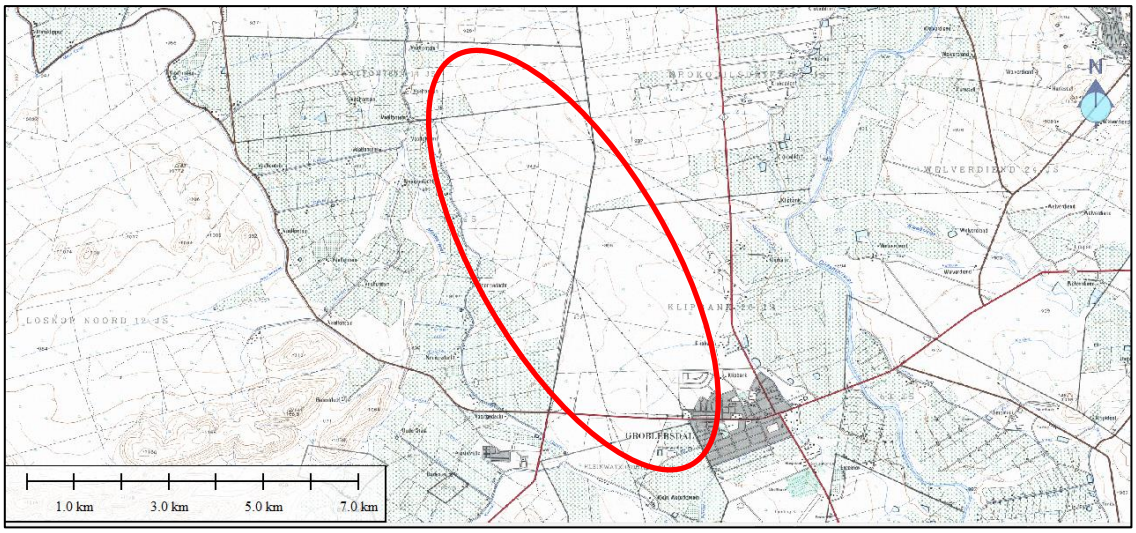

Figure 1: Approximate area of the power lines for the proposed project.

METHODS

Desktop study

Prior to the site visit and field survey, limited 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. A desk top study was conducted to generate lists of species historically recorded at or near the site, or that are likely to occur at the site.

Field survey

The field survey was planned to include all the different habitat types and to target threatened species that may occur in the area, to determine the likelihood of their presence and how the proposed activities will impact upon them.

During the survey, a walk-about was conducted to investigate the current vegetation status in the proposed corridor for the new power line and a general plant list was completed. Photographs of important features were taken and will be included in the report. Three red data species supplied by SANBI (2015) occur in the ¼ degree for the study site. The following protected trees are listed in the veld type: *Sclerocarya birrea* and *Vachellia erioloba*. In the case of *Vachellia erioloba*, the habitat for it (deep, red sand) was not present in the corridor.

According to in the National Environmental Management Biodiversity Act (Act 10 of 2004) (NEMBA) the vegetation type is not listed as vulnerable (NEMBA, 2004). Management and mitigations actions are discussed in detail in the summary and Addendum 1 at the end of the report.

With regard to the erosion issues, the management and mitigation recommendations is captured in the discussion of the report and in the “Management and Mitigation” summary (Addendum 1).

Vegetation

According to Mucina and Rutherford (2006) the study area consists of one vegetation type (Figure 2 and 3). The vegetation units fall within the Savanna Biome (SV) and the units form part of the Central Bushveld (cb) vegetation units.

The vegetation unit known as the Central Sandy Bushveld (SVcb 12) (Mucina and Rutherford, 2006) (Figure 3). Earlier the Central Sandy Bushveld was known as the Mixed Bushveld and the Sourish Mixed Bushveld (Acocks, 1953) or Mixed Bushveld (Low and Rebelo, 1996).

The Central Sandy Bushveld is distributed in the Gauteng, Limpopo, North West and Mpumalanga provinces. The habitat varies from flat open areas (Springbokvlakte) through undulating areas to Mountains (Pilansberg and Waterberg) and the altitude varies between 850 and 1 450m (Mucina and Rutherford, 2006).

Geology

For the Central Sandy Bushveld, the larger part of the southern and eastern part of the region is underlain by granite of the Lebowa Granite Suite and some granophyte of the Rashoop Granophyte Suite. In the north, sedimentary rock of the Waterberg Group dominates. (Mucina and Rutherford, 2006).

Climate

The Central Sandy Bushveld is in the summer rainfall area with very dry winters. The annual MAP varies between 500 and 700 mm and temperatures vary between 35.3° C and -3.1° C (Mucina and Rutherford, 2006).

Conservation

The Central Sandy Bushveld is vulnerable and only 3% of the targeted 19% is conserved. Approximately 24% is transformed, mostly cultivation (19%) and some urban areas. Alien Plants include: *Cereus jamacaru, Eucalyptus spp., Lantana camara, Melia azedarach, Opuntia ficus-indica* and *Sesbania punicea* (Mucina and Rutherford, 2006).

Two protected tree is listed for the area and three red data plants present are listed in Addendum 2 (SANBI, 2015).

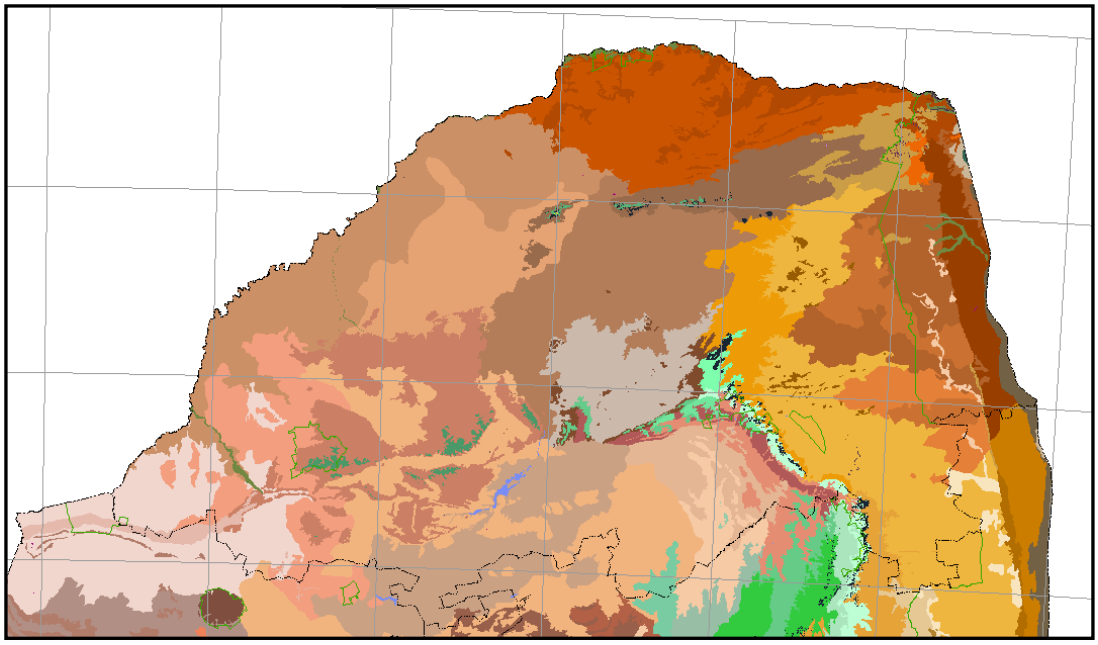

Figure 2: Regional vegetation map: vegetation map in the Limpopo Province according to Mucina and Rutherford (2006).

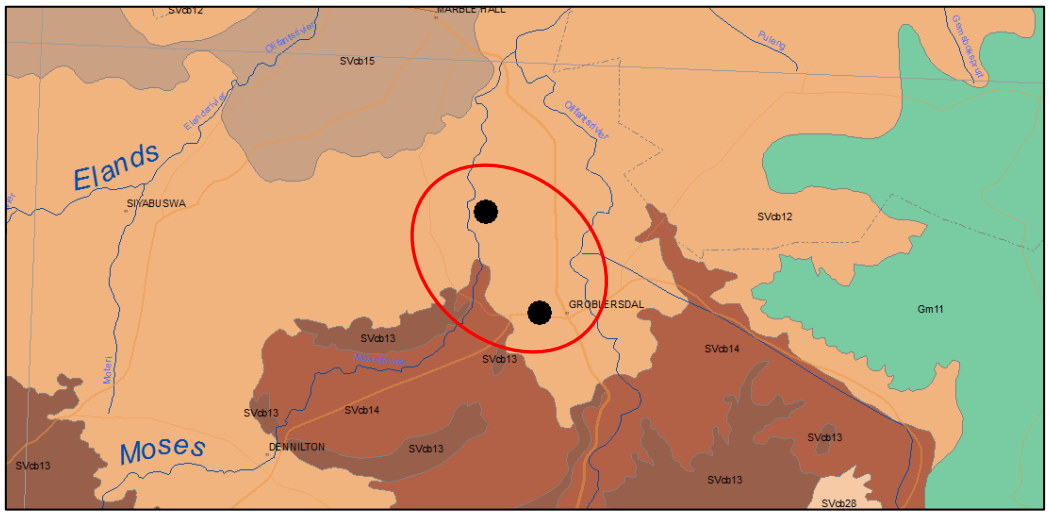

Figure 3: Vegetation type found in area of the proposed project.

RESULTS and DISCUSSION

For the project, only one route was examined, as this is an existing servitude owned by Eskom. It was decided to use this route, as it follows an existing power line and the corridor is cleared, lowering the need to remove large numbers of indigenous trees. In addition, the existing servitude can be used as access road during the construction and maintenance of the power line, again lowering the impact to the natural vegetation (Figure 4 and 5). Impacts along the route included cultivation, grazing and infrastructure development.

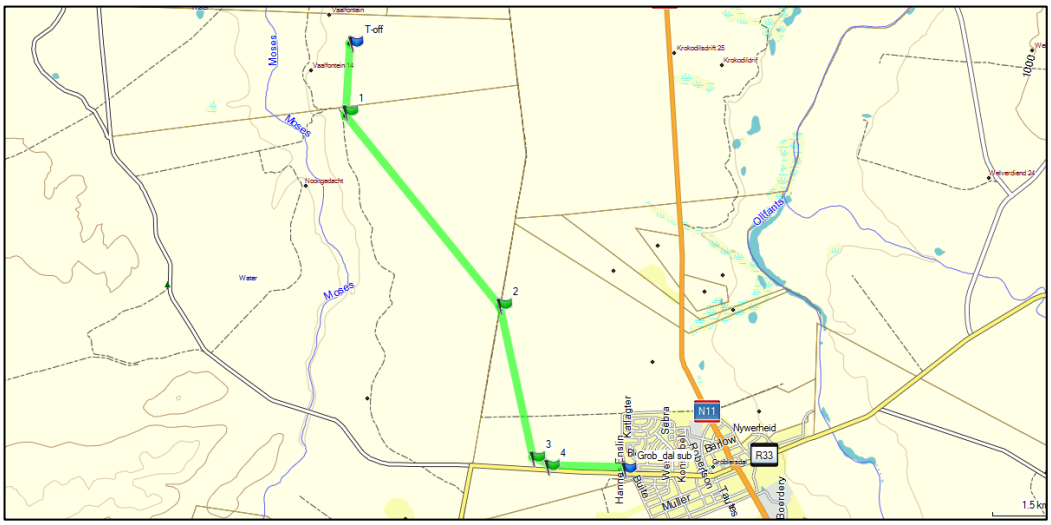

Figure 4: Approximate route for the new power line from the T-off from the Silimela power line to the existing Groblersdal substation.

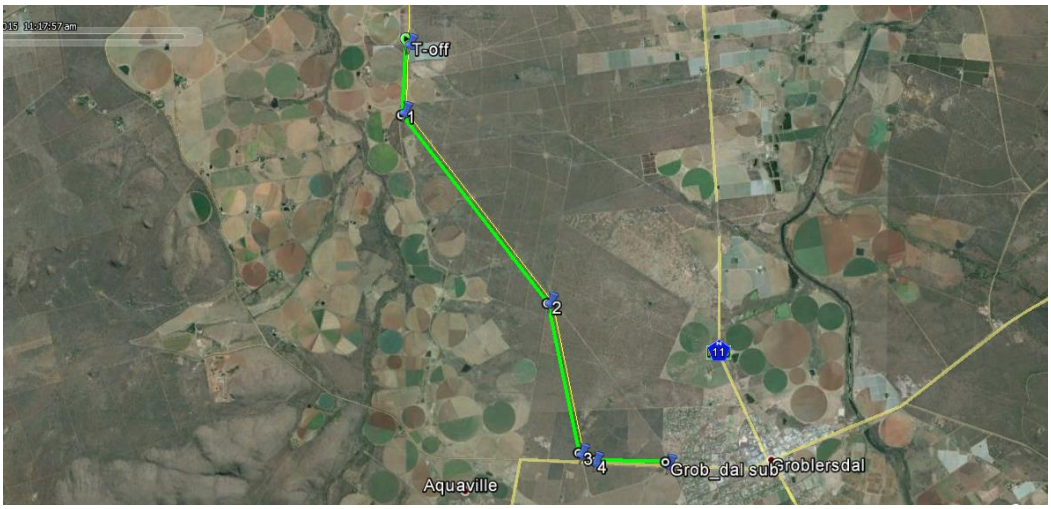

Figure 5: Aerial image of the new power line.

The first sector of the power line starts at the T-off point from the Silimela power line on the farm Vaalfontein (14JS) to the area on the farm Loskop Noord (12JS) where it swings to the south (Figure 6 and 7).

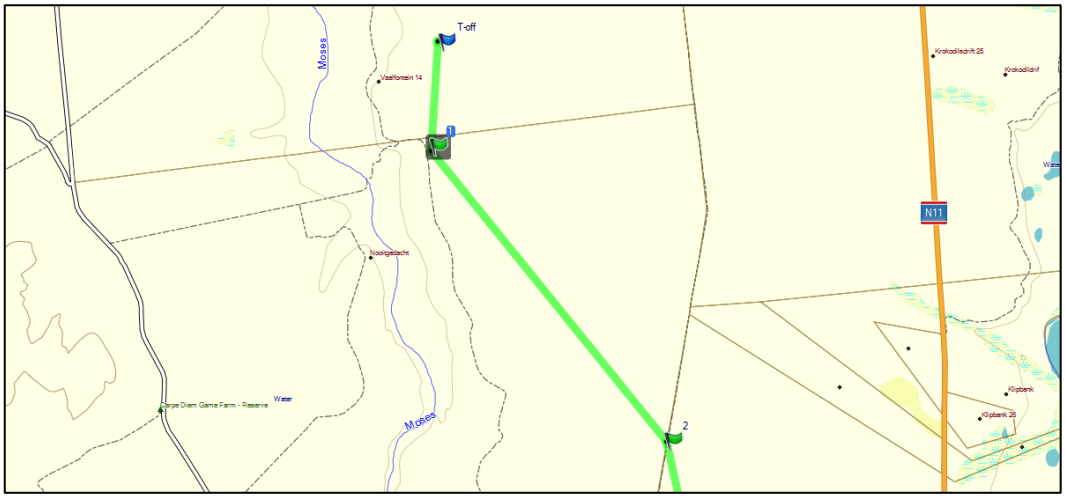

Figure 6: The first sector of the power line from the farm Vaalfontein to Loskop Noord.

Figure 7: The aerial view of the corridor.

The first part of the corridor passes between cultivated areas (centre pivots and orchards) with very little natural vegetation present. As the route turns to the

southeast (Figure 6 and 7 – marker 1) it crosses into areas of mixed land-use. The majority of activities are grazing, with patches of cultivation noted.

The vegetation is dominated by: *Dichrostachys cinerea, Combretum apiculatum, C. zeyheri, Senegalia burkei, Vachellia robusta, V. tortilis, V. sieberiana, Peltophorum africanum, Sclerocarya birrea, Grewia monticola, Terminalia sericea, Searsia pyroides, S. leptodictya* and some *Strychnos pungens* with the grasses dominated by *Eragrostis nindensis, Panicum maximum, Themeda triandra* and *Schmidtia pappophoroides* (Figure 8 – 13).

Figure 8: View near the T-off point.

Figure 9: Example of current agricultural activities on the farm Vaalfontein.

Figure 10: New power line to follow existing lines – existing servitude.

Figure 11: Further south the natural vegetation dominates – grazing for cattle and game farming.

Figure 12: Encroachment due to poor land-use practices present along large sections of this sector of the corridor.

Figure 13: View of the vegetation on the cattle and game farms.

The second sector between the farm Loskop Noord and the Groblersdal substation passes through an area with most of the natural vegetation in a poor to fair condition (Figure 14 and 15). Some of the activities are grazing with small areas under cultivation. In addition the roads and infrastructure associated with the farms had an impact on the environment. Just north of Groblersdal, the newly developed informal settlement is having a negative impact on the environment and it is linked to over grazing, erosion, dumping of refuse, poor sanitation and accelerated erosion (Figure 16 – 21).

Figure 14: Corridor (sector 2) from the farm Loskop Noord to the existing substation.

Figure 15: Aerial view of the corridor (sector 2) from the farm Loskop Noord to the existing substation.

Figure 16: Sector 2 of the corridor following the existing power lines.

Figure 17: View of the natural vegetation in a fair condition.

Figure 18: Vegetation in a good condition – no signs of over grazing on some farms.

Figure 19: Example of poor land-use practices resulting in exposed soils and erosion.

Figure 20: View of the corridor following the border of the informal settlement to the substation.

Figure 21: The crossing of the road at the Groblersdal substation.

RECOMMENDATIONS

- From an ecological perspective the proposed route for the new Silimela/Groblersdal power line is viable. The corridor uses the existing servitude and cut through an area with large current impacts, resulting in lowering the need for the clearing of natural vegetation. Permits for cutting, trimming and removal of *Sclerocarya birrea* must be acquired before clearing of the servitude can commence. A walk down study must be carried out to count and map the trees.
- Soils are highly **erodible** and care must be taken during construction to lower the risk of accelerated erosion.
- With careful planning of the construction activity impacts to the sensitive areas (slopes and exposed areas) can be reduced.
- Ensure no oil or fuel spills occur during construction or installation of transformers.
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- Make sure no wood collection takes place by contractors.

Summary

- The study area investigated had a vegetation cover in a “poor state to fair state” with impacts related to grazing, cultivation, wood collection, settlement development, poor infra-structure maintenance and erosion.
- From an ecological perspective the proposed corridor for the power line is viable. Minimum clearing for this servitude is needed.
- Before any clearing or trimming commences, this specialist must accompany Eskom and the contractors to verify trees to be trimmed or cut.
- *Sclerocarya birrea* is present and the numbers must be counted and mapped once the final route is pegged (walk down study).
- Three red book data plant species is recorded for the area (Addendum 2) but the habitats they prefer is not present along the corridor.
- With regard to biodiversity patterns, little if any impacts will occur.
    - The vegetation type occurs over a very large area and the narrow corridor for the power line will have no large-scale negative impact on it.

- No red data plant species were noted, as their preferred habitat is not present.
- Some alien plant infestations were observed on the site or in the near vicinity. Clearing of soil can always lead to some infestations.
- The activity will have no real impact on biodiversity processes. The only possible impact can be oil or fuel spillages that can occur during construction or the installation and maintenance of the transformers. It is always suggested that fuel and oil must not be stored on site during the construction phase and that containment dams or berms are constructed around transformers. In addition, a clear plan how to manage accidental spills must be included in the EMP for the site.

Addendum 1 is a summary of potential problems that can be encountered during the construction of the substation and associated power line. Some mitigating and management actions/strategies are listed.

Addendum 2 is red data species listed on SANBI précis list.

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Addendum 1: List of impacts and suggested mitigating and management strategies.

Silimela/Groblersdal project		
Theme	Natural environment	
Nature of issue	Erosion	
Stage	Construction and maintenance	Possibility high for erosion during construction due to soil types and slopes.
Extent of impact	Site, local and region	The impact will be moderate to high on-site (power line servitude), but limited to low on a regional scale. Silt will have a negative impact in streams and rivers, but will be low to moderate for this project, if well managed.
Duration of impact	Immediate	If not addressed on constant basis, permanent damage is a reality. Currently erosion is a problem in the area.
Intensity	High	If not properly managed as part of operational plan, it will be high.
Probability of occurrence	High	Must be managed on daily basis.
Status of the impact	Project: negative Environment: negative	If well managed, can be neutral for both.
Cumulative impact	High.	If no maintenance is done, the impact will have a compounding impact on the environment.
Level of significance	Low-medium if controlled.	Will be high if not managed.
Mitigation measures	• Limited traffic during construction. • Constant rehabilitation during construction. • Must have maintenance strategy as part of EMP.	Limit traffic along the power line servitude.
Level of significance after mitigation	Low.	
EMP requirements	• A surface runoff and storm water management plan, indicating the management of all surface runoff generated as a result of the development (during both the construction and operational phases) prior to entering any natural drainage system or wetland, must be submitted (e.g. storm water and flood retention ponds). • Special care needs to be taken during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural drainage systems/wetlands. In order to prevent erosion, mechanisms are required for dissipating water energy. • An on-site ecological management plan must be	

	implemented including management recommendations as well as potential rehabilitation of severely disturbed areas.	
Nature of issue	Construction – material, by products and construction sites.	This includes accommodation, storing of material and ablution facilities for all workers during construction. It is recommended that no workers stay on the construction sites along the servitude for the power line at any time.
Stage	Construction and maintenance	Must have strict environmental guidelines and management plan in place before clearing and construction can commence.
Extent of impact	Site, local and region	Can have a medium impact on site, related to pollution, but the impact in the region will be low.
Duration of impact	Immediate	If not addressed on constant basis, permanent damage is a reality.
Intensity	Low/moderate	If not properly managed as part of operational plan, it will be high.
Probability of occurrence	High	Must be managed on daily basis.
Status of the impact	Project: negative Environment: negative	If well managed, can be neutral for both.
Cumulative impact	Marginal.	If no maintenance is done, the impact will have a compounding impact on the environment.
Level of significance	Low-medium if controlled.	Will be very high if not managed.
Mitigation measures	• Proper ablution facilities on site. • Constant management during construction. • Contain oils and fuel in berm area. • Must have rehabilitation strategy as part of EMP.	This refers to storage of material, oil and fuel spills, ablution facilities and rehabilitation of construction sites at the completion of the project. Build containment berms around oil and fuel storage areas. All by products and materials must be disposed at approved sites.
Level of significance after mitigation	Low.	Will have to form part of the EMP to ensure low impact/significance at completion.
EMP requirements	• During the construction phase, workers must be limited to areas under construction and access to neighbouring undeveloped areas must be strictly regulated. • Construction should be limited to the daylight hours preventing disturbances to the nearby human populations. • All temporary stockpile areas litter and rubble must be removed on completion of construction. All dumped material must be taken to an approved dump site in the area.	

	• Soil stockpiling areas and storage facilities must follow environmentally sensitive practices and be situated a sufficient distance away from drainage areas or drainage lines. • The careful position of soil piles and runoff control during all phases of development will limit the extent of erosion occurring on the site.	
Nature of issue	Pollution	Includes oil and fuel spills, erosion, storage of by-products and ablution facilities.
Stage	Construction and maintenance	Must have a strict environmental guidelines and management plan in place before clearing and construction can commence.
Extent of impact	Site, local and region	Can be severe if not well managed. Must be done on a daily basis (part of the EMP).
Duration of impact	Immediate	If not addressed on constant basis, permanent damage is a reality. Water pollution can be a severe problem.
Intensity	Low/moderate	If not properly managed as part of operational plan, it will be high.
Probability of occurrence	High	Must be managed on daily basis.
Status of the impact	Project: negative Environment: negative	If well managed, can be neutral for both.
Cumulative impact	Marginal - compounding	If no maintenance is done, the impact will have a compounding impact on the environment.
Level of significance	Low-medium if controlled.	Will be very high if not managed.
Mitigation measures	• Proper ablution facilities on site. • Constant rehabilitation of erosion problems. • Berms to contain spills. • Proper storage facilities of construction materials. • Waste management is very important. Proper storage and removal strategy must be in place. • Must have rehabilitation strategy as part of EMP.	This refers to storage of material, oil and fuel spills, ablution facilities and rehabilitation of construction sites at the completion of the project. Due to the nature of the slopes and soils, water pollution can be a problem if not properly managed.
Level of significance after mitigation	Low.	Will have to form part of the EMP to ensure low impact/significance at completion.
EMP requirements	• Proper strategy to prevent erosion – see above. • Berms and containment measures for fuels and oils, also around transformers to prevent spills during accidents and maintenance. • Clean-up plan/strategy if spills occur. • Proper facilities (ablution) to ensure no sewerage spills into streams and rivers.	

	• Proper storage of material during construction and clean-up after the construction is completed. • Proper strategy to remove and dispose of oil from transformers.	
Nature of issue	Alien vegetation	Includes all exposed areas – and servitude for the power line.
Stage	Construction and maintenance	Must have a strict environmental guideline and management plan in place before clearing and construction can commence.
Extent of impact	Site, local and region	Can be severe if not well managed. Must be done on a daily basis (part of the EMP).
Duration of impact	Immediate	If not addressed on constant basis, permanent damage is a reality. Many exotics are present and can invade exposed areas during and after construction.
Intensity	Low/moderate	If not properly managed as part of operational plan, it will be very high.
Probability of occurrence	High	Must be managed on regular basis.
Status of the impact	Project: negative Environment: negative	If well managed, can be neutral for both.
Cumulative impact	Marginal - compounding	If no maintenance is done, the impact will have a compounding impact on the environment.
Level of significance	Low-medium if controlled.	Will be very high if not managed.
Mitigation measures	• Need to ensure all alien plants on construction sites are removed. • Must clear alien vegetation on a regular basis. • Must have rehabilitation strategy as part of EMP.	
Level of significance after mitigation	Low.	Will have to form part of the EMP to ensure low impact/significance at completion.
EMP requirements	• Proper strategy to prevent invasive alien plants from establishing and this will further prevent pollution and erosion – see above. • Regular maintenance and inspections and removal of alien plants. • Possible to link with Working for Water in this regard.	
Nature of issue	Removal on natural vegetation	The servitude for the power line.
Stage	Construction and maintenance	Must have strict environmental guidelines and management plan in place before clearing and construction can commence.
Extent of impact	Site, local and region	Limited removal of vegetation for the servitude of the power

		line is needed. The impact on site will be low to moderate, with very low impact on local and regional level. Can be severe if not well managed. Must be monitored on a daily basis (part of the EMP) to ensure no illegal removing or cutting occur. Use existing roads for access where possible.
Duration of impact	Permanent	The removal of plants from the corridor for the power line will have permanent impact.
Intensity	Low/moderate	Although the duration of the impact is of a permanent nature, the intensity is low on a local and regional scale. The immediate habitat surrounding the power line corridor is in a fair-poor condition. The protection of the environment is the function of local and provincial authorities and this will be important. The construction of the power line will have negligible impacts if well managed.
Probability of occurrence	High	Again, the impact will be confined to the site of the substation. In the larger environment, the probability will be low.
Status of the impact	Project: negative Environment: neutral	If well managed, can be neutral for both.
Cumulative impact	Marginal	If maintenance is poor, the impact will have a compounding result on the environment. One refers to illegal or unnecessary cutting of trees on the power line servitude during routine clearing of vegetation. This must be well managed by all role players (Eskom and conservation authorities).
Level of significance	Low-medium if controlled.	Will be very high if not managed.
Mitigation measures	• Limited plants need to be removed when clearing the servitude for the new power line. Clear guidelines and proper plans must be given to the contractor. Daily inspections are needed to prevent problems. • Must clear alien vegetation on a regular basis. • Exposed areas should be rehabilitated with a grass mix that blends in with the surrounding vegetation. The grass mix should consist of indigenous grasses adapted to the local environmental conditions. The grass seeds should a variety of grass species including several pioneer species. • Must have rehabilitation strategy as part of EMP.	A clear plan must be in place before the project commence. The contractor must clearly understand where to clear. The area should be marked. All trees to be cut must be marked. Trees to be trimmed should be marked and the contractor should understand what branches must be cut/trimmed. A policy should be in place to penalise the contractor. Eskom and conservation services should have an official on site to ensure no problems occur.
Level of significance after mitigation	Low.	Will have to form part of the EMP to ensure low impact/significance at completion.
EMP requirements	• Proper strategy to prevent invasive alien plants from	

	establishing and this will further prevent pollution and erosion – see above. • Regular maintenance and inspections and removal of alien plants. • Possible to link with Working for Water in this regard.	
Nature of issue	Wood collection	Includes servitude for power line and where workers stay.
Stage	Construction and maintenance	Must have a strict environmental guidelines and management plan in place before clearing and construction can commence. Preferable no workers to stay on site. Wood collection (mostly illegal) is having serious environmental consequences.
Extent of impact	Site, local and region	Must be monitored on a daily basis (part of the EMP) to ensure no illegal removing or cutting occur.
Duration of impact	Permanent	The removal of fire wood will have a permanent effect on the environment.
Intensity	Moderate to high	Although the duration of the impact is of a permanent nature, the intensity is moderate to high on a local and regional scale. The immediate habitat surrounding the corridor is in a poor to fair condition. The protection of the environment is the function of local and provincial authorities and this will be important.
Probability of occurrence	High	The impact to the surrounding environment will be high.
Status of the impact	Project: negative Environment: negative	If well managed, can be neutral for both.
Cumulative impact	Compounding	If not controlled the cumulative impact will have a compounding effect on animal and bird populations in the area. This must be well managed by conservation authorities.
Level of significance	Low if controlled.	Will be very high if not managed.
Mitigation measures	• It is suggested that no workers stay on site and must be limited to the construction site as far as possible.	The contractor must understand the importance of the issue and the impacts poor management will have on the environment.
Level of significance after mitigation	Low.	
EMP requirements	• Proper strategy to prevent illegal wood collection. • Regular inspections to monitor if illegal activities occur.	

Addendum 2: Red data plants listed in the SANBI Précis lists (2015).

Family	*Genus and species*	Status	Description of distribution	Habitat	Probability of occurring
ASPHODELACEAE	*Haworthia koelmaniorum*	VU	A highly localized species (EOO 389 km²), that has declined by at least 30% within one to two generations, primarily due to collecting for horticultural purposes, but also habitat loss and degradation. The population is estimated to consist of fewer than 4000 mature individuals, with none of the 10 known subpopulations numbering more than 1000 mature individuals, and decline continues.	Groblersdal to Loskop Dam	Bushveld, on sandstone outcrops and ridges.
FABACEAE	*Argyrolobium megarrhizum*	NT	Although it has a highly restricted range (EOO 2500 km²), there are currently estimated to be 10-20 locations. It is likely to have lost habitat to agriculture, and its habitat is being transformed rapidly due to urban expansion between Pretoria and Bronkhorstspruit. This species relies on pollination by carpenter bees and the ongoing habitat loss will impact on the population dynamics of these insects and is likely to affect pollination rates. In addition, changes in fire regimes as a result of habitat loss and degradation will impact this species as it only flowers profusely after fire.	Pretoria to Bronkhorstspruit.	Mixed bushveld.
HYACINTHACEAE	*Eucomis vandermerwei*	VU	EOO 7210 km², known from six to eight locations. It has lost habitat to afforestation and is declining as a result of overgrazing and trampling by livestock, harvesting for medicinal purposes, a deleterious fire regime and alien plant invasion. It is also potentially threatened by coal mining.	Dullstroom to Steenkampsberg and Middelburg	Short, sour montane grassland on sandy, low-pH soils derived from quartzitic rocky outcrops. In rock crevices or under overhanging rocks, confined to outcrops on slopes and plateaus of higher peaks, predominantly on north-facing slopes, 2200-2500 m.