

IMPACT ASSESSMENT

1. ASSESSMENT OF THE SIGNIFICANCE OF THE POTENTIAL IMPACTS

1.1 CRITERIA OF ASSIGNING SIGNIFICANCE TO POTENTIAL IMPACTS

The assessment of impacts was done according to a synthesis of the following assessment criteria:

- Nature of the impact
- Extent (spatial scale)
- Duration
- Magnitude or intensity of the impact (severity)
- Probability


Nature of the impact

This is an appraisal of the type of effect the impact (whether positive or negative and/or direct or indirect) activity is expected to have on each relevant environmental component.

Extent

Extent of impact	Explanation of extent
Site specific	Direct and indirect impacts limited to construction site and directly surrounding area
Local	Direct and indirect impacts affecting environmental elements within the Knysna/Rheenedal area
Regional	Direct and indirect impacts affecting environmental elements within the Western Cape Province
National	Direct and indirect impacts affecting environmental elements on a national level
Global	Direct and indirect impacts affecting environmental elements on a global level

Duration

Duration of impact	Explanation of duration
Very short	Less than 1 year
Short	1 to 2 years
Medium	2-5 years
Permanent	5 years 

Magnitude or intensity of the impact (severity)

Here it was established whether the impact would be destructive or benign and rated as:

Low – where the impact affects the environment in such a way that natural, social and cultural functions and processes are not affected;
Moderate – where the affected environment is altered, but natural, social and cultural functions and processes continue albeit in a modified way
Severe – where natural, social and cultural functions or processes are altered to the extent that it will temporarily or permanently cease.

Probability

Probability of impact occurrence	Explanation of probability
Very low	< 20% sure of particular fact or likelihood of impact occurring
Low	20 to 39% sure of particular fact or likelihood of impact occurring
Moderate	40 to 59% sure of particular fact or likelihood of impact occurring
High	60 to 79% sure of particular fact or likelihood of impact occurring
Very high	80 to 99% sure of particular fact or likelihood of impact occurring
Definite	100% sure of particular fact or likelihood of impact occurring

Impact significance

Impact significance	Explanation of significance
No impact	There would be no impact at all – not even a very low impact on the system or any of its parts
Very low	<p>Impact would be negligible</p> <ul style="list-style-type: none"> • In the case of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple • In the case of positive impacts, alternative means would almost all likely to be better, in one or a number of ways, than this means of achieving the benefit
Low	<p>Impact would be of a low order and with little real effect</p> <ul style="list-style-type: none"> • In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required, or both • In case of positive impacts, alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these
Moderate	<p>Impact would be real but not substantial within the bounds of those which could occur.</p> <ul style="list-style-type: none"> • In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible • In the case of positive impacts, other means of achieving these benefits would be about equal in time, cost and effort

High	<p>Impacts of a substantial order</p> <ul style="list-style-type: none"> • In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. • In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these
Very high	<p>Of the highest order possible within the bounds of impacts which could occur</p> <ul style="list-style-type: none"> • In the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which it was predicted. • In the case of positive impacts, there is no real alternative to achieving the benefit.

1.2 POTENTIAL IMPACT OF EACH MAIN ACTIVITY IN EACH PHASE, AND CORRESPONDING SIGNIFICANCE ASSESSMENT

Soils	ASSESSMENT
Impact	<ol style="list-style-type: none"> 1. Concrete foundations for the pylons 2. Increased risk for soil erosion
Nature of impact	<ol style="list-style-type: none"> 1. Negative direct impact 2. Negative direct impact
Extent	<ol style="list-style-type: none"> 1. Site specific 2. Site specific
Duration	<ol style="list-style-type: none"> 1. Permanent 2. Permanent
Magnitude	<ol style="list-style-type: none"> 1. Moderate 2. Moderate
Probability	<ol style="list-style-type: none"> 1. Definite 2. Moderate
Significance	<ol style="list-style-type: none"> 1. Low 2. Low-Moderate
Phase where impact will occur	<ol style="list-style-type: none"> 1. Construction Phase 2. Construction and Operational Phase

<i>Fauna & Flora</i>	ASSESSMENT
Impact	Loss of natural vegetation and faunal habitat
Nature of impact	Negative direct impact
Extent	Local
Duration	Medium
Magnitude	Moderate
Probability	Medium
Significance	Moderate
Phase where impact will occur	Construction

<i>Groundwater</i>	ASSESSMENT
Impact	Potential for groundwater pollution as a result of oil spills, etc.
Nature of impact	Negative and direct impact
Extent	Site specific
Duration	Short
Magnitude	Moderate
Probability	Low
Significance	Moderate
Phase where impact will occur	Construction Phase

<i>Surface Freshwater Resources</i>	ASSESSMENT
Impact	Construction of foundations and access roads
Nature of impact	Negative direct
Extent	Site specific
Duration	Short
Magnitude	Moderate
Probability	Moderate
Significance	Moderate / Low
Phase where impact will occur	Construction

<i>Avifauna (Birds)</i>	ASSESSMENT
Impact	Risk for collision and habitat transformation
Nature of impact	Negative direct impact
Extent	Local
Duration	Permanent for collision Very short for habitat transformation
Magnitude	Low
Probability	Medium
Significance	Low
Phase where impact will occur	Operational Phase

<i>Cultural / Heritage</i>	ASSESSMENT
Impact	Heritage resources may be damaged / destroyed
Nature of impact	Negative and direct
Extent	Local
Duration	Permanent
Magnitude	Low
Probability	Low
Significance	Low
Phase where impact will occur	Construction Phase

<i>Visual Impact</i>	ASSESSMENT
Impact	The visual quality of the area could be compromised by the new power lines.
Nature of impact	Negative indirect
Extent	Site specific and local
Duration	Permanent
Magnitude	Low
Probability	Low
Significance	Moderate
Phase where impact will occur	Construction Phase

<i>Community</i>	ASSESSMENT
Impact	An influx of workers could result in an increased risk for crime and safety.
Nature of impact	Negative indirect
Extent	Site specific and local
Duration	Short
Magnitude	Moderate
Probability	Low
Significance	Moderate
Phase where impact will occur	Construction Phase

<i>Noise</i>	ASSESSMENT
Impact	Labourers and machinery could result in noise pollution
Nature of impact	Negative direct impact
Extent	Site specific
Duration	Short
Magnitude	Low
Probability	Moderate
Significance	Low
Phase where impact will occur	Construction Phase

<i>Air quality</i>	ASSESSMENT
Impact	Dust created by construction vehicles
Nature of impact	Negative and direct impact
Extent	Site specific
Duration	Short
Magnitude	Low
Probability	Low
Significance	Very low
Phase where impact will occur	Construction phase

1.3 ASSESSMENT OF POTENTIAL CUMULATIVE IMPACTS

The current situation with regards to difficulty for the maintenance teams to inspect and maintain the power line due to water logged soils will improve drastically. The network performance will therefore improve due to a more efficient maintenance program.

ASSESSMENT OF THE NO GO ALTERNATIVE

Eskom is currently in the process of the upgrading of various electrical networks in the Limpopo Province and this Rampheri- Thabamopo North Project forms part of this vision and upgrades. To not construct the new 132kV power line, not upgrade the substations, to not construct the new CNCs and to continue the use of the 33kV power line, will have a huge negative impact on various electrical networks within the province. The no-go option is definitely not the preferred alternative for this project.

2. PROPOSED MITIGATION MEASURES TO MINIMISE ADVERSE IMPACTS

Environmental components that will be impacted on that require mitigation are

- Soils
- Vegetation
- Groundwater
- Avifauna (birds)
- Fauna & Flora
- Cultural-heritage and Palaeontology
- Visual Impact
- Surface Freshwater Resources
- Community
- Noise
- Air quality

Environmental Component	<i>Soils</i>
Environmental Management / Mitigation Measures / Action Plans / Commitments	
<p>Impact Description Concrete foundations will be made for each pylon along the powerline route. Vegetation will therefore be cleared and there may be an increase in surface water runoff which could lead to soil erosion. The south western half of the route lies on imperfectly drained sandy soils which may be highly erodible. Extra care should therefore be taken within these areas.</p>	

Mitigation for erosion

- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969. Access roads and site surfaces must be monitored for deterioration and possible erosion. Pro-active measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil erosion.
- All cleared areas must be ripped and rehabilitated after construction. The top 200mm layer of topsoil must be removed and stockpiled in heaps not higher than 2m and replaced on the construction areas once the activities have been completed. The affected areas should be replanted with a grass mixture indigenous to the area.
- All vehicle movement must be along existing roads or tracks as far as possible.
- All stormwater runoff must be managed efficiently so as to avoid stormwater damage and erosion to adjacent properties.
- The viability of undertaking construction during the dry months of the year should be investigated in order to overcome possible problems caused by excessive moisture.
- Should any new temporary access roads be required, the following should apply in areas which are prone to erosion:
 - Where a cutting is made, subsoil drains should be installed wherever a perched water table occurs within 900m of the formation in all cuttings and below fills in the alluvial zones.
 - It is further critical to manage surface water. Drains should be provided along the top and bottom of all deep cuttings. This is to minimise the flow of surface water and erosion to the exposed cut faces and erosion along the toe of the cuttings.
 - Steep sections of the service road must be supplied of sufficient drainage areas to reduce flow velocity of run-off water.
 - Any eroded sections must be rehabilitated and part of the management plan must include regular inspections of the water run-off areas.
- If any erosion occurs, rehabilitation must immediately be done.
- All embankments (if any) must be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.
- After construction, all temporary access roads should be rehabilitated.
- The site must be rehabilitated and replanted with suitable, indigenous grass to prevent erosion.
- Should any signs of erosion be evident along the access and maintenance roads during the operational phase of the project, remedial action should take place as soon as possible.

Environmental Component	<i>Fauna & Flora</i>
Environmental Management / Mitigation Measures / Action Plans / Commitments	
<p>Impact Loss of natural vegetation, habitat fragmentation (loss of landscape connectivity), impacts on species of special concern (sensitive plant communities), establishment of declared weeds and alien invasive plants and an increased risk for veld fires could impact on the flora within the study area. Disturbance to and/or destruction of habitat and illegal placement of snares could impact on the <i>Fauna</i> within the study area.</p>	

The results of the impact evaluations show that the proposed power lines should have no severe (high) impacts on the different units with low-medium impacts over the short-medium term that will be experienced in the different vegetation units (fauna & flora).

The impacts on the loss of flora and habitat will be low to medium due to the areas having few sensitive species (except for the declining *Vachellia erioloba* in unit 1). The expected influence could however be further mitigated by restricting the clearing of natural vegetation to as small an area as needed for the construction of the pylons.

The fragmentation of the habitat is not expected to be of any significance with normal connectivity between ecosystems still intact due to the relatively small footprint of the pylons. Any fragmentation will also be mitigated by clearing as small an area as possible when constructing the pylons.

MITIGATION - FAUNA

The following general recommendations are made to minimise the impacts of proposed powerline construction on the immediate environment and remaining fauna:

- Close site supervision must be maintained during construction.
- Workers must be limited to areas under construction within the servitude and access to the undeveloped areas must be strictly regulated (“no-go” areas during construction activities).
- All temporary stockpile areas including litter and dumped material and rubble must be removed on completion of construction. All alien invasive plant should be removed from the site to prevent further invasion.
- Firearms or any other hunting weapons must be prohibited on site.
- Contract employees must be educated about the value of wild animals and the importance of their conservation.
- Educational programmes for the contractor’s staff must be implemented to ensure that project workers are alerted to the possibility of snakes being found during vegetation clearance. The construction team must be briefed about the management of snakes in such instances. In particular, construction workers are to go through ongoing refresher courses to ensure that protected snakes, such as Southern African Python, are not killed or persecuted when found.
- Severe contractual fines must be imposed and immediate dismissal on any contract employee who is found attempting to snare or otherwise harm remaining faunal species.
- No animals should be intentionally killed or destroyed and poaching and hunting should not be permitted on the site.

Mammal management recommendations

- Due habitat transformation and destruction as well as the high level of human activity within the proposed it is however unlikely that the study area comprises significant habitat for any larger threatened mammal species. These are restricted to the private game parks in the area.
- All large indigenous tree species should be conserved wherever possible as they form important habitat for arboreal mammal species.
- No hunting or poaching activities must be allowed along the servitudes during all phase of the project.

Reptile management recommendations

- No rock removal should occur adjacent to the proposed towers. No termite mounds should be intentionally destroyed. If any moribund termite mounds have to be destroyed due to tower position it should be carefully excavated by hand and pick.
- Any animals rescued or recovered will be relocated in suitable habitat away from the transmission tower and line.
- Trees including stumps; bark and holes in trees are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors).
- Exotic cleared vegetation should form wood piles and logs and stumps. Dead or decaying wood piles should be created as these will provide valuable refuge areas especially due to the clearance of vegetation cover. Logs and stumps also provide important habitats for several reptile species as well as smaller mammals, amphibians, arachnids and scorpions. With time they will eventually be reduced to valuable compost by several animal species. Dead trees and stumps will also be used for nesting purposes by barbets, hoopoes, owls, hornbills as well as perching or hunting platforms for birds like the kingfisher. Any lizards, gecko's, agamids, monitors or snakes encountered should be allowed to escape to suitable habitat away from the disturbance. No reptile should be intentionally killed, caught or collected during any phase of the project.
- Several venomous snake species occur along the proposed lines including Cape Cobra (*Naja nivea*) and Puff Adder (*Bitis arietans*).
- General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area.
- Appropriate foot wear (sturdy leather boots) should be worn in the field.

Amphibian management recommendations

- Construction activities of the proposed powerline should be restricted to daylight hours reducing the potential impact on the nocturnal breeding activities of the majority of amphibian species.
- Ideally the installation of the new towers should be undertaken during the dry winter months (May-September) when the majority of amphibian species are dormant.
- As a precautionary mitigation measure it is recommended that the developer and construction contractor as well as an independent environmental control officer (ECO) should be made aware of the possible presence of certain threatened amphibian species (Giant Bullfrog) prior to the commencement of construction of the new line.

MITIGATION - FLORA

The following general recommendations are made to minimise the impacts of proposed powerline construction:

- Provision of adequate toilet facilities must be implemented to prevent the possible contamination of ground (borehole) water in the area.
- All temporary stockpile areas including litter and dumped material and rubble must be removed on completion of construction. All alien invasive plant should be removed from the site to prevent further invasion.
- All vegetation not interfering with the operation of the line shall be left undisturbed this is especially pertinent to the protected and red data Camel Thorn (*Vachellia erioloba*). None of these species may be removed without permission from the DAFF & Nature Conservation.
- Collection of firewood and traditional medicinal plants is strictly prohibited.

- All alien vegetation should be eradicated along the corridor.
- In areas where degradation has taken place as a result of the construction, a suitably qualified ecologist or rehabilitation specialist should be appointed for the commencement of rehabilitation activities. The specialist should identify areas requiring rehabilitation as well as appropriate seed mixes which are required.
- No open fires shall be allowed on site under any circumstance. The Contractor shall have fire-fighting equipment available on all vehicles working on site, especially during the winter months.
- As a precautionary mitigation measure it is recommended that the developer and construction contractor as well as an environmental control officer should be made aware of the possible presence of certain threatened animal species (Giant Bullfrog, South African Hedgehog) prior to the commencement of construction activities. In the event that any of the above-mentioned species are discovered the animal should not be interfered with and allowed to move away from the construction activities

Vegetation clearance

The object of vegetation clearing is to trim, cut or clear the minimum number of trees and vegetation necessary for the safe mechanical construction and electrical operation of the transmission line. Only an 8m strip may be cleared flush with the ground to allow vehicular passage during construction. No scalping shall be allowed on any part of the servitude road unless absolutely necessary.

Vegetation clearing on tower sites must be kept to a minimum. Any alien invasive trees with large root systems shall be cut manually and removed, as the use of a bulldozer will cause major damage to the soil when the root systems are removed. Stumps shall be treated with herbicide. Smaller vegetation can be flattened with a machine, but the blade should be kept above ground level to prevent scalping. Any vegetation cleared on a tower site shall be removed or flattened and not be pushed to form an embankment around the tower.

Disturbed areas of natural vegetation as well as cut and fills must be rehabilitated immediately to prevent soil erosion as well as alien invasive vegetation invasion. The use of herbicides shall only be allowed after a proper investigation into the necessity. Eskom's approval for the use of herbicides is mandatory. Application shall be under the direct supervision of a qualified technician. All surplus herbicide shall be disposed of in accordance with the supplier's specifications. All alien vegetation in the total servitude and densifiers creating a fire hazard shall be cleared and treated with herbicides.

It is recommended that a contractor for vegetation clearing should comply with the following parameters:

- The contractor must have the necessary knowledge to be able to identify the protected tree *Vachellia (Acacia) erioloba*; (camel thorn) interfering with the operation of the line due to their height and growth rate.
- The contractor must also be able to identify declared weeds and alien species (*Prosopis glandulosa**, *Opuntia* spp.) that can be totally eradicated.
- The contractor must be in possession of a valid herbicide applicators license.

Protected species

- Only one red data/protected species (the tree *Vachellia erioloba*) was observed in vegetation unit 1 (with large numbers of them already dying due to red iron dust pollution) that could be negatively affected if large numbers are removed or damaged. This will have a local effect on their populations and could be long-term.

- This could however be mitigated by placing the pylons and powerlines such that as little as possible / none of these species are affected. A walk-down exercise by qualified Eskom personnel or a botanist should be undertaken after the final route has been decided upon and the placement of the pylons has been marked in the field.
- If single individuals of these species have to be removed, a permit from the Department of Agriculture, Fisheries and Forestry (Forestry Branch) will have to be obtained for this purpose.

Alien invasive species

- A total of three different declared alien invasive species, the tree *Prosopis glandulosa* (unit 1) and the succulents *Opuntia ficus-indica* (unit 2) and *Cylindropuntia imbricata* (formerly *Opuntia imbricata*) (unit 1) were found to be present in the study area. Thus the clearing of vegetation around the proposed pylon sites could create an opening for these species to invade these sites. This influence will however be site specific and could be mitigated by implementing a long-term monitoring plan whereby any growth of this species are eradicated with immediate effect. The areas affected by the construction activities should also be rehabilitated as soon as the construction is completed. That would also assist in preventing these species establishing.

Environmental Component	Groundwater
Environmental Management / Mitigation Measures / Action Plans / Commitments	
<p>Impact description Extra care would be required to minimise the risk for potential groundwater pollution as a result of oil spills, etc. during the construction period.</p> <p>Mitigation</p> <ul style="list-style-type: none"> ○ In all cases, abstraction of water from watercourses for construction purposes will not be allowed. Arrangements must be made prior to construction with the landowners or municipal water must be carted in. ○ Under no circumstances must surface or groundwater be polluted. ○ Adequate oil containment precautions must be taken. ○ If a spill from a construction vehicle occurs it must be reported to ECO with immediate effect. A bio-remediation contractor must be appointed to rehabilitate large oil spills. Small oil spills must be cleaned immediately with an oil spill kit. ○ Minimise on-site storage of petroleum products. ○ Ensure proper maintenance procedures are in place for vehicles and equipment. ○ Servicing of vehicles to be done in designated areas with appropriate spill management procedures in place. ○ Ensure that measures to contain spills are readily available on site (spill kits). ○ All hazardous substance spills must be reported, recorded and investigated. ○ All stormwater runoff must be managed efficiently so as to avoid stormwater damage and erosion to adjacent properties. ○ During and after construction, stormwater control measures should be implemented especially around stockpiled soil, excavated areas, trenches etc. to avoid the export of soil into any watercourse. 	

- Stormwater should not be discharged into the working areas and it should be ensured that stormwater leaving the footprint of the proposed development areas is not contaminated by any substance, whether that substance is solid, liquid, vapor or any combination thereof.
- Stockpiling of construction material and soils should be such that pollution of water resources is prevented and that the materials will be retained in a storm event.
- Drinking water and water for ablution facilities must be provided to all construction workers on the construction site.

- Waste Management

General Waste

- Expected constructed waste (unused steel, conductor cables, cement or concrete) and general waste around the construction site (plastic, tins and paper) may degrade the environment if not disposed in the correct manner.
- Littering or illegal dumping of any waste material is prohibited.
- No waste disposal holes may be made on site.
- Under no circumstances should waste be burnt on site.
- Waste separation should be encouraged for recycling purposes.
- Provision must be made for the collection of all general waste materials. Rubbish bags and bins with lids must be provided at various points within the construction corridor and must be emptied on a regular basis.
- Deposit solid domestic waste in containers and dispose at registered municipal waste disposal sites regularly.
- For all waste that is disposed of, Eskom shall obtain waste manifests and disposal certificates, which shall be recorded and reported to the ECO on a monthly basis.
- Liquid waste (grey water) must be disposed with sewerage.

Construction Waste

- Ensure compliance with stringent daily clean up requirements of site camp inert waste (waste concrete, reinforcing rods, waste bags, wire, timber etc) and dispose at municipal waste disposal sites.
- Construction waste must be collected and sold for recycling purposes as far as possible.

Sewage

- Portable ablution facilities must be placed within the construction servitude and must be serviced by registered companies only and on a regular basis. There should be one toilet for every fifteen workers.
- No effluent to be dumped in the veld or any watercourse.
- The use of the open veld for ablution is prohibited.

Hazardous Waste

- Oil contaminated waste (soil, cloths used to clean small spills, spill kits, content of drip trays, etc.) must be disposed of at a facility that is registered as a hazardous landfill facility.

- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled. All these hazardous substances should be disposed of at a H:H registered waste disposal facility.
- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- Persons who remove hazardous waste must be appropriately qualified and authorised.

Environmental Component	<i>Aquatic Ecosystems</i>
Environmental Management / Mitigation Measures / Action Plans / Commitments	
<p>Impact</p> <p>DECOMMISSIONING OF EXISTING POWER LINE</p> <p><i>Nature of Impact</i></p> <p>Activities that would be associated with the dismantling and the removal of the existing powerline will include the following:</p> <ul style="list-style-type: none"> • Access to all the existing pylon structures; • Dismantling of structures; and • Removal of the material from site. <p>Activities during the dismantling phase of the line could be expected to have a very <i>limited aquatic habitat disturbance</i> due to the fact that the existing line occurs within a servitude to the powerlines with an existing access road. A localised short term impact could be expected that would be associated with increased disturbance within the servitude with larger vehicles. The longer term impact could potentially be positive but of a very low significance if properly decommissioned and rehabilitated.</p> <p><i>Significance of impacts without mitigation</i></p> <p>A longer term impact of very low overall significance in terms of its impact on the identified aquatic ecosystems.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • The decommissioning activities should be limited as far as possible and should take place in the in the dry season. • Traffic (vehicular and pedestrian) between structures within the demarcated wetland areas must be kept to a minimum. These areas should be clearly marked with poles. • Any top soil removed to re-fill the foundation area after construction should be stored outside of the demarcated areas. No material may be stored or dumped (temporarily or semi-permanent) in these depression wetland areas. • If material needs to be filled or excavated within the demarcated wetlands for the removal of the pylons, the replaced soil should be returned such that the top soil layer is replaced last. The filled area should resemble the surface height of the surrounding landscape. No ponding or new drains should be created. 	

- Cleared areas must be rehabilitated after dismantling is completed by re-vegetating with suitable indigenous plants that have been removed prior to the dismantling phase. An experienced botanist or horticulturalist should assist with this rehabilitation process.
- Invasive alien plants that currently exist within the immediate area of the existing servitude must be removed and any regrowth prevented and managed for a period of at least 5 years.

Significance of impacts after mitigation

A localized, short-term impact will occur during the decommission phase; however, the overall significance of the impact on the aquatic ecosystems is expected to be a very low positive impact.

CUMULATIVE IMPACT OF THE ACTIVITIES ON FRESHWATER ECOSYSTEMS

The proposed project will result in the decommissioning of the existing power line route. This decommissioning will take place within an Eskom servitude where a number of powerlines are present and the freshwater features within the servitude have been modified by these activities. The proposed decommissioning has the potential to reduce the disturbance of the freshwater features within the servitude. A new power line will be constructed along the N14 road where it will be easily accessible. Due to the activities associated with the road, the area adjacent to the road is already disturbed. Construction of the powerline is not likely to significantly alter the current ecological state. In addition, no freshwater features occur along the proposed route or its alternative.

As a result, it is expected that there will be short term and localised negative impacts that are of a very low significance, mostly occurring during the decommissioning of the existing line with no impacts during the construction phase of the new line. Over the longer term, a low positive impact can be expected.

Environmental Component	<i>Avifauna (Birds)</i>
Environmental Management / Mitigation Measures / Action Plans / Commitments	
<p>Impact A risk for electrocution, birds colliding with powerlines and habitat destruction & disturbance could have an impact on the <i>avifauna</i> of the area.</p> <p>Mitigation</p> <ul style="list-style-type: none"> • Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species. • Measures to control noise should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned. 	

- The final powerline alignment must be inspected on foot by the avifaunal specialist prior to construction to ascertain if any Red Data species nests are present. All relevant detail must be recorded i.e. species, coordinates and nest status. Should any nests be recorded, it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist and the Environmental Control Officer. An effective communication strategy should be implemented whereby the avifaunal specialist is provided with a construction schedule which will enable him/her to ascertain when and where such breeding Red Data species could be impacted by the construction activities. This could then be addressed through the timing of construction activities during critical periods of the breeding cycle, once it has been established that a particular nest is active.
- An Eskom approved bird friendly pole design must be used, as per Appendix 2 in the Bird Impact Assessment Report. The Distribution Technical Bulletin must be used in this regard. A Bird Perch must be installed on top of all poles, to provide safe perching substrate for birds well above the dangerous hardware.
- With regards to the infrastructure within the substation yard, the hardware is too complex to warrant any mitigation for electrocution at this stage. It is rather recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach because Red Data bird species are unlikely to frequent the substation and be electrocuted.
- Due to the very low collision risk posed by the powerlines to powerline sensitive Red Data species, no mitigation is required specifically for potential collision mortality.
- Decommissioning activity should be restricted to the immediate footprint of the infrastructure.

Environmental Component	<i>Cultural / Heritage / Palaeontological Impact</i>
Environmental Management / Mitigation Measures / Action Plans / Commitments	
<p>Impact During the survey no site of cultural heritage significance was identified on any of these. From a heritage perspective any of the proposed routes may be utilised.</p> <p>The overlying Kalahari sands are most unlikely to contain any in situ fossils of significance. The underlying rocks are too old to contain any body fossils but there is a very small chance that stromatolites could occur far below the foundations for the towers, infrastructure and stations. If stromatolites are encountered then it is recommended that a small sample be sent to a palaeontologist to assess for microfossils (algae). It is concluded that the project may continue as far as the paleontology is concerned.</p> <p>Mitigation It should be noted that the subterranean presence of archaeological and/or historical sites, graves, features or artifacts is always a distinct possibility. Due to the density of vegetation in certain areas along the routes, it also is possible that some sites may only become known later on. Operating controls and monitoring should therefore be aimed at the possible unearthing of such features. Care should therefore be taken when development commences that if any of these are discovered, a qualified archaeologist be called in to investigate the occurrence.</p>	

Environmental Component	<i>Visual Impact</i>
Environmental Management / Mitigation Measures / Action Plans / Commitments	
<p>Impact</p> <p>The proposed Preferred power line routing is located to the west of the N14 on modified Kathu Bushveld and Kuruman Thornveld. The VRM Class for this landscape is rated Class IV due to the Low rating for the Scenic Quality and the expected Low receptor sensitivity to landscape change. The low Scenic Quality rating is due to the flatter terrain, fragmented and modified vegetation, no water resources and the surrounding landscape context which is strongly associated with mining. The Receptor Sensitivity to this alternative is rated low due to the strongly modified mining landscape with is clearly visible in the background, as well as no tourist related activities, or landscape sensitive receptors.</p> <p>The main receptors that would use this landscape are limited to the N14 road users traveling in a north and south direction. Due to the strong vertical line element in the existing landscape created by the telecommunication poles in the immediate foreground, and existing Eskom lattice mast in the background, the contrast generated by the proposed monopoles is expected to be weak. The modified mining landscape forms in the background also further increase the VAC levels in this westerly view direction, resulting in less noticeable form contrast from the monopoles.</p> <p>Due to the higher VAC levels of the site, as well as the mining landscape context, the Extent of the visual impact is expected to remain contained to local levels. Although the structures are likely to become permanent features, Magnitude of this Preferred Alternative is rated Low due to the expected weak levels of visual contrast. Due to the already strongly modified mining landscape in the background (which will become more modified by the expansion of the proposed Sishen Tailings Dam), Cumulative Risks to the area from further landscape degradation are rated as Low. Without Mitigation, the proposed power line landscape modification is rated Medium and Low with Mitigation.</p> <p>Mitigation</p> <p><i>New power lines</i></p> <ul style="list-style-type: none"> • Planning Phase: <ul style="list-style-type: none"> ○ Maintain a 100m buffer where possible from the N14 Road servitude to create a visual buffer as well as to allow for future expansion of the N14 should this become necessary. • Construction Phase: <ul style="list-style-type: none"> ○ Utilising existing access roads as much as possible. • Operation Phase: <ul style="list-style-type: none"> ○ On-going maintenance for soil erosion along maintenance access routes. <p><i>Decommissioning of the existing power lines</i></p> <ul style="list-style-type: none"> • Planning Phase: <ul style="list-style-type: none"> ○ Generation of a detailed management plan on how to access the wetland buffer area so as to reduce site specific impacts during the deconstruction process, using only existing access roads during dry season periods. 	

- Deconstruction Phase:
 - Utilising existing access roads as much as possible.
 - If the power line structures and cables can't be reused or recycled, then disposing of the materials according to South Africa waste regulations.
- Post Deconstruction Phase:
 - On-going maintenance for soil erosion along previous maintenance access routes.

Environmental Component	Community
Environmental Management / Mitigation Measures / Action Plans / Commitments	
<ul style="list-style-type: none"> • Construction workers must be extremely careful not to damage any property along the proposed route. Should any damage occur it should be reported to the ECO and repaired and to a state prior to the damage to the written satisfaction of the landowner and ECO. • Removal of agricultural products is prohibited. • No firewood may be collected. • No open fires are to be made on private property. • In order to prevent and/or minimise crime, it is required that all construction workers be supplied with controlled serviced accommodation or be supplied with daily transport to and from the site. • No wandering on adjacent properties is allowed, unless written consent has been obtained from the relevant landowners. • All adjacent landowners have to be informed of the blasting programme (if applicable) prior to any blasting taking place. Contractors must liaise personally with adjacent landowners. All communication in this regard must be documented. Blasting may only be undertaken by specialists in the field and should be limited to small localised areas. All relevant legislation must be adhered to. • All contractors and construction workers will be issued with temporary permits to enter the property. • All construction workers will be allowed only for specified day light hours. Transport should be made available by the contractor to remove labourers from the site after working hours. • Secure accommodation facilities must be provided for guarding personnel. • Supervision of labourers must at all times take place. • Construction hours will be restricted to specific periods that exclude Sundays and public holidays. • Sweeping of construction sites, clearing of building rubble and debris and watering of construction sites (storage areas, roads, etc.) must take place on a regular basis. • All excavated areas must be clearly marked and barrier tape must be placed around them to prevent humans and animals from falling into them. 	

Environmental Component	Noise
Environmental Management / Mitigation Measures / Action Plans / Commitments	
<ul style="list-style-type: none"> • Should an onsite construction camp be necessary noise made by the workers (i.e. radios) must be limited to early evenings. • Plan campsites an appropriate distance from any facility where it can cause a nuisance. • Construction vehicles must be services on a regular basis to ensure unnecessary noise is not emitted due to poor vehicle performance. • Eskom shall provide all necessary equipment with standard silencers and maintain silencer units on vehicles where required. Equipment must always be in good working order to minimise unnecessary noise levels. 	

Environmental Component	Air quality
Environmental Management / Mitigation Measures / Action Plans / Commitments	
<ul style="list-style-type: none"> • Sweeping of construction sites, clearing of building rubble and debris and watering of construction sites (storage areas, roads, etc.) must take place on a regular basis. 	

REVIEW OF THE SIGNIFICANCE OF THE IDENTIFIED IMPACTS

<i>Environmental component</i>	<i>Significance before mitigation</i>	<i>Significance after mitigation</i>
Soil Erosion	Medium	Low
Fauna & Flora	Medium	Low
Groundwater pollution	Moderate	Low
Aquatic ecosystems	Low	Low Positive
Avifauna	Low	Very Low
Cultural / Heritage	Low	Very Low
Visual Impact	Medium	Low
Increased crime and safety risk with increased labourers	Moderate	Low
Noise Pollution	Low	Very low
Air quality (Dust created by construction vehicles)	Low	Very Low