PROPOSED DEVELOPMENT OF A 132 KV TRANSMISSION LINE (FROM THE EXISTING HARVARD 132 KV LINE TO NOORDSTAD) AS WELL AS 6 SUB-STATIONS, BLOEMFONTEIN, MANGAUNG METROPOLITAN MUNICIPALITY, FREE STATE PROVINCE

Impact Assessment Report

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2. INTRODUCTION

The following report identifies the potential environmental impacts (both positive and negative) which the construction as well as operational phases of the proposed project will have on the surrounding environment.

Once the potential environmental impacts are identified, they are assessed by rating their Environmental Risk after which the final Environmental Significance is calculated and rated for each identified environmental impact.

The same Environmental Risk rating process is then followed for each environmental impact to determine the Environmental Significance if the recommended mitigation measures were to be implemented.

The objective of this section is therefore firstly to identify all the potential environmental impacts of the proposed project and secondly to determine the significance of the impacts and how effective the recommended mitigation measures will be able to reduce their significance. The potential environmental impacts which are still rated as highly significant, even after implementation of mitigations, can then be identified in order to specifically focus on implement of effective management strategies for them.

3. METHODOLOGY FOR IMPACT ASSESSMENT AND RISK RATING

The tables below indicate and explain the methodology and criteria used for the evaluation of the Environmental Risk Ratings as well as the calculation of the final Environmental Significance Ratings of the identified potential environmental impacts.

Each potential environmental impact is scored for each of the Evaluation Components as per Table 1 below.

Table 1: Scale utilised for the evaluation of the Environmental Risk Ratings

Evaluation Component	Rating Scale and Description/criteria
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	**10 - Very high**: Bio-physical and/or social functions and/or processes might be *severely* altered. **8 - High**: Bio-physical and/or social functions and/or processes might be *considerably* altered. **6 - Medium**: Bio-physical and/or social functions and/or processes might be *notably* altered. **4 - Low** : Bio-physical and/or social functions and/or processes might be *slightly* altered. **2 - Very Low**: Bio-physical and/or social functions and/or processes might be *negligibly* altered. **0 - Zero**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	**10 - Very high (positive)**: Bio-physical and/or social functions and/or processes might be *substantially* enhanced. **8 - High (positive)**: Bio-physical and/or social functions and/or processes might be *considerably* enhanced. **6 - Medium (positive)**: Bio-physical and/or social functions and/or processes might be *notably* enhanced. **4 - Low (positive)**: Bio-physical and/or social functions and/or processes might be *slightly* enhanced. **2 - Very Low (positive)**: Bio-physical and/or social functions and/or processes might be *negligibly* enhanced. **0 - Zero (positive)**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
DURATION	**5 - Permanent** **4 - Long term**: Impact ceases after operational phase/life of the activity > 60 years. **3 - Medium term**: Impact might occur during the operational phase/life of the activity – 60 years. **2 - Short term**: Impact might occur during the construction phase - < 3 years. **1 - Immediate**
EXTENT (or spatial scale/influence of impact)	**5 - International**: Beyond National boundaries. **4 - National**: Beyond Provincial boundaries and within National boundaries. **3 - Regional**: Beyond 5 km of the proposed development and within Provincial boundaries. **2 - Local**: Within 5 km of the proposed development. **1 - Site-specific**: On site or within 100 m of the site boundary. **0 -** None

IRREPLACEABLE loss of resources	**5 – Definite** loss of irreplaceable resources. **4 – High** potential for loss of irreplaceable resources. **3 – Moderate** potential for loss of irreplaceable resources. **2 – Low** potential for loss of irreplaceable resources. **1 – Very low** potential for loss of irreplaceable resources. **0 - None**
REVERSIBILITY of impact	**5 –** Impact **cannot** be reversed. **4 – Low** potential that impact might be reversed. **3 – Moderate** potential that impact might be reversed. **2 – High** potential that impact might be reversed. **1 –** Impact **will be** reversible. **0 –** No impact.
PROBABILITY (of occurrence)	**5 - Definite**: >95% chance of the potential impact occurring. **4 - High probability**: 75% - 95% chance of the potential impact occurring. **3 - Medium probability**: 25% - 75% chance of the potential impact occurring **2 - Low probability**: 5% - 25% chance of the potential impact occurring. **1 - Improbable**: <5% chance of the potential impact occurring.
Evaluation Component	**Rating Scale and Description/criteria**
CUMULATIVE impacts	**High**: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern. **Medium**: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern. **Low**: The activity is localised and might have a negligible cumulative impact. **None**: No cumulative impact on the environment.

Once the Environmental Risk Ratings have been evaluated for each potential environmental impact, the Significance Score of each potential environmental impact is calculated by using the following formula:

- **SS (Significance Score) = (magnitude + duration + extent + irreplaceable + reversibility) x probability.**

The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table 2 below. The Environmental Significance rating process is completed for all identified

potential environmental impacts both before and after implementation of the recommended mitigation measures.

Table 2: Scale used for the evaluation of the Environmental Significance Ratings

Significance Score	Environmental Significance	Description/criteria
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	Medium-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked.
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

4. DESCRIPTION OF POTENTIAL IMPACTS AND THEIR RECOMMENDED MITIGATION MEASURES

The following section provides descriptions of the potential environmental impacts which the proposed project will have as well as the recommended mitigation measures to be implemented for each impact as identified during the Basic Assessment process.

4.1 CONSTRUCTION PHASE

4.1.1 Ecological Impacts

Destruction/transformation of vegetation of pre-existing transformed and disturbed cultivated lands and road servitudes within the transmission line route corridor associated with the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type

The development of the proposed transmission line through transformed and disturbed cultivated lands and road servitudes as identified per heading 8.1 and Figure 12 (see Specialist Report) could result in the transformation and destruction of surface vegetation. The physical impacts will however be localised in extent and mainly restricted to the actual proposed pylon footprint areas. Due to the pre-existing transformed and disturbed nature of such areas, the significance of these potential impacts on vegetation will be very low.

Mitigation measures to reduce potential impacts:

- It is recommended that pylons, as far as practicably possible, be placed within such already transformed areas in order to minimise the impacts on remaining semi-natural and natural vegetation.
- Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible.

Destruction/transformation of vegetation of pre-existing transformed and disturbed cultivated lands and road servitudes within the sub-station footprints associated with the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type

The footprints of Outspan, Rooidam, Olivier and Tevrede distribution centres will all be situated within pre-existing transformed and disturbed areas. The development of these proposed sub-stations on transformed and disturbed cultivated lands and road servitudes as identified per heading 8.1 and Figure 12 (see Specialist Report) will result in the transformation and destruction of surface vegetation. The physical impacts will however be localised in extent and restricted to the actual proposed sub-station footprint areas. Due to the pre-existing transformed and disturbed nature of such areas, the significance of these potential impacts on vegetation will be very low.

Mitigation measures to reduce potential impacts:

- The construction footprint of the sub-stations must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion should take place.
- Existing roads, farm tracks and service roads in close proximity to the proposed sub-station locations must be used as far as practicably possible.
- The construction and subsequent operation of the sub-stations must be continually managed in terms of an adequate and approved Environmental Management Programme (EMPr).

Destruction/transformation of semi-natural and natural vegetation within the transmission line route corridor associated with the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type and the Winburg Grassy Shrubland (Gh 7) vegetation type

The development of the proposed transmission line through semi-natural and natural areas as identified per headings 8.2 & 8.3 and Figure 12 (see Specialist Report) could result in the transformation and destruction of surface vegetation. The physical impacts will however be localised in extent and mainly restricted to the actual proposed pylon footprint areas. These remaining semi-natural and natural areas form part and play significant roles in larger surrounding continual natural corridors. They are therefore subsequently also very important to the habitat persistence and ecological functionality of the surrounding ecosystem. The significance of these potential impacts on the vegetation will therefore be medium.

Mitigation measures to reduce potential impacts:

- It is recommended that the amount of pylons to be placed within these natural areas be restricted and pylons rather be placed in transformed areas, as far as practicably possible. This must be done in order to minimise impacts on the habitat and ecological functionality of the natural areas.
- It is recommended that the Steel Monopole tower type be implemented in the natural areas as far as practicably possible due to its smaller physical surface footprint size and subsequent reduced impact on the vegetation.
- Pylon construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised pylon footprint expansion should take place.
- Once the proposed transmission line layout designs have been finalised by the applicant, an ecological walkthrough of the final pylon footprint positions must be conducted in order to identify any potentially significant species individuals which would require relocation. These walkthrough and

potential relocation activities must be completed prior to the commencement of and construction processes.

- No physical maintenance (removal or defoliation by means of cutting or burning) is allowed on the natural vegetation present inside the proposed transmission line route servitude.
- Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible.
- Significant care must be taken to ensure that no significant woody shrubs or trees are removed from the route corridor during the construction or operational/maintenance phase of the proposed project development. If any removal of woody shrubs or trees individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation.
- It is recommended that Alternative 2 for the proposed transmission line route corridor rather be followed in order to minimise the impact on remaining natural area of the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type.

Destruction/transformation of natural vegetation within the sub-station footprints associated with the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type

The footprints of Mimosa & Hillandale distribution centres will all be situated within natural areas associated with the Bloemfontein Dry Grassland (Gh 5) vegetation type. The development of these proposed sub-stations on natural areas as identified per heading 8.3 and Figure 12 (see Specialist Report) will unfortunately result in the transformation and destruction of surface vegetation. The physical impacts will however be localised in extent and mainly restricted to the actual proposed sub-station footprint areas. These remaining natural areas form part and play significant roles in larger surrounding continual natural corridors. They are therefore subsequently also very important to the habitat persistence and ecological functionality of the surrounding ecosystem. The significance of these potential impacts on the vegetation will therefore be medium-high.

Mitigation measures to reduce potential impacts:

- The construction footprint of the sub-stations must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion should take place.
- Once the sub-station designs have been finalised by the applicant, an ecological walkthrough of the final sub-station footprints must be conducted in order to identify any potentially significant species

individuals which would require relocation. These walkthrough and potential relocation activities must be completed prior to the commencement of any construction processes.

- Existing roads, farm tracks and service roads in close proximity to the proposed sub-station locations must be used as far as practicably possible.
- The construction and subsequent operation of the sub-stations must be continually managed in terms of an adequate and approved Environmental Management Programme (EMPr).

Destruction/transformation of a Critical Biodiversity Area associated with the transmission line route corridor

An approximately 3.3 km portion at the end of the proposed transmission line main loop will traverse a Critical Biodiversity Area (CBA) as identified per heading 8.4 and Figure 12 (see Specialist Report). The CBA portion of the line route corridor is situated within an undisturbed, naturally vegetated area consisting of numerous hills associated with the Winburg Grassy Shrubland (Gh 7) vegetation type and which are intertwined with a mosaic of rocky outcrops of the Bloemfontein Karroid Shrubland (Gh 8) vegetation type. The development of the proposed transmission line through the CBA could result in the transformation and destruction of surface vegetation. The majority of the transmission line will however have a small actual surface footprint impact on the vegetation of the CBA; impact will mainly be restricted to pylon construction footprints. The presence of an existing line has also slightly reduced the local pristineness in its immediate vicinity. The significance of the impact on the CBA will thereof be lower than it would have been if the line had to traverse another portion of the CBA on its own.

The natural, undisturbed vegetation of the CBA forms part of a larger natural corridor which plays a very significant role in faunal and floral migration and dispersion activities. It is therefore extremely important that the structural integrity, species diversity and subsequent ecological connectivity and functionality as part of the larger natural corridor be maintained and not be significantly impacted upon by any proposed development. The significance of these potential impacts on the CBA will therefore be medium-high.

Mitigation measures to reduce potential impacts:

- It is recommended that the amount of pylons to be placed within the CBA be restricted, as far as practicably possible, in order to minimise impacts on the habitat and ecological functionality of the natural areas.
- It is instructed that only the Steel Monopole tower type be implemented in the CBA due to its smaller physical surface footprint size and subsequent reduced impact on the vegetation.

- Pylon construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised pylon footprint expansion should take place.
- Pylon placement within any significant rocky outcrops of the Bloemfontein Karroid Shrubland (Gh 8) vegetation type to be prevented as far as practicably possible.
- No site camp footprint to be established within the CBA and the entire construction phase planning and layout which is to occur within the CBA to firstly be reviewed and approved by a suitably qualified, registered and experienced ecologist in order to ensure minimal impact is achieved.
- Once the proposed transmission line layout designs have been finalised by the applicant, an ecological walkthrough of the final pylon footprint positions within the CBA must be conducted in order to ensure that no Bloemfontein Karroid Shrubland (Gh 8) vegetation type rocky outcrops will be significantly impacted upon and to identify any potentially significant species individuals which would require relocation. These walkthrough and potential relocation activities must be completed prior to the commencement of and construction processes.
- No physical maintenance (removal or defoliation by means of cutting or burning) is allowed on the natural vegetation present inside the proposed transmission line route servitude.
- Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible. An existing CENTLEC 33 kV transmission line already runs through a portion of the CBA and the proposed transmission line will be developed directly adjacent to it. This could enable the utilisation of exiting service roads.
- Significant care must be taken to ensure that no significant woody shrubs or trees are removed from the route corridor during the construction or operational/maintenance phase of the proposed project development. If any removal of woody shrubs or trees individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation.
- The noise impact and disturbance of wild animals and game must be adequately managed and kept to a minimum during construction.

Destruction/damage to Red Data Listed or protected species individuals associated with the transmission line route corridor and sub-station footprints

Only one Red Data Listed species (*Boophone disticha*; Declining) and number of provincially protected species were identified within the proposed transmission line route corridor and associated sub-station footprints (see heading 8 in Specialist Report). The development of the transmission line and associated sub-stations will inevitably destroy or damage such individuals. The physical impacts relating to the transmission

line will however be localised in extent and mainly restricted to the actual proposed pylon footprint areas. Although a Red Data Listed species was identified, the presence and distribution extent is low. The significance of these potential impacts on the species individuals will therefore be medium.

Mitigation measures to reduce potential impacts:

- Pylon construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised pylon footprint expansion should take place.
- Once the proposed transmission line layout designs have been finalised by the applicant, an ecological walkthrough of the final pylon footprint positions must be conducted in order to identify any potentially significant species individuals which would require relocation. These walkthrough and potential relocation activities must be completed prior to the commencement of any construction processes.
- The construction footprint of the sub-stations must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion should take place.
- Once the proposed sub-station designs have been finalised by the applicant, an ecological walkthrough of the final sub-station footprints must be conducted in order to identify any potentially significant species individuals which would require relocation. These walkthrough and potential relocation activities must be completed prior to the commencement of any construction processes.
- Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible.

Surface material erosion

Areas around established pylon footprints could potentially be prone to significant surface soil erosion due to the loosening of materials and potential removal of vegetation during construction which usually binds surface material. Due to the large number of pylons to be constructed, the significance of this potential impact will be medium.

Mitigation measures to reduce potential impacts:

- Implement suitable erosion prevention measures at all construction footprints.
- Areas around pylon footprints must be adequately rehabilitated to prevent significant erosion.

Alien invasive species establishment

Areas around established pylon footprints could potentially be prone to significant alien invasive species establishment due to disturbances caused by construction activities. Due to the large number of pylons to be constructed, the significance of this potential impact will be medium.

Mitigation measures to reduce potential impacts:

- Implement suitable alien invasive species prevention measures at all construction footprints.
- Areas around pylon footprints must be adequately rehabilitated to prevent significant alien invasive species establishment.

Damage to or impeding of watercourses

The proposed transmission line route corridor traverses a number of seasonal drainage lines and perennial watercourses. The development of the proposed transmission line over identified watercourses could result in the alteration of watercourse structures or impediment or diversion of flow. The identified drainage lines and watercourses cumulatively contribute in a significant manner towards adequate water drainage of the larger surrounding local catchment areas and are therefore vitally important to the ecological functionality of the surrounding ecosystem. The significance of these potential impacts on the watercourses will therefore be medium.

Mitigation measures to reduce potential impacts:

- Any impact on the vegetation and watercourse structures or impediment or diversion of flow must be completely avoided. Transmission line design and layout must therefore ensure the continued ecological functionality and unimpeded flow of the watercourse after construction completion.
    - Care must be taken to ensure that no woody shrubs or trees are removed from the watercourse areas during the construction or operational/maintenance phase of the proposed project development. If any removal of woody shrubs or trees individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation.
- Adequate buffer areas to be implemented around identified watercourses.
    - No access or construction routes or any physical footprint impacts are to be made within the recommended buffer areas without the prior inspection and approval by a suitably qualified, registered and experienced ecologist.

  - No pylons to be constructed within the recommended buffer areas. If any pylon construction is required within the buffer areas, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the proposed footprint areas and provide recommendations on their management.
- Any areas around the watercourses potentially impacted by the construction of the transmission line must be to be adequately rehabilitated.

4.1.2 Avifaunal Impacts

Avifaunal habitat destruction and displacement caused by sub-station development

Construction of the proposed substations will entail land levelling and complete destruction of the existing habitat. During the process it is possible that active nests could be destroyed or that birds breeding in the area could experience disturbance. However, the impacted area is relatively small and if the footprint of all construction related activities are restricted to designated areas and minimized wherever practically possible, the probability of negative impact would be very low. The non-threatened status of the taxa involved does not warrant any other mandatory mitigation measures. At present the habitat at the sites of the proposed substations includes woodland (Outspan), agricultural fields (Tevrede) and grassland (Rooidam, Olivier, Mimosa and Hillandale).

Mitigation measures to reduce potential impacts:

- The footprint of all construction related activities should be restricted to designated areas and minimized wherever practically possible.

Avifaunal disturbance and displacement caused by transmission line development

During construction there will be movement of personnel and vehicles along the route of the proposed overhead power lines. Building materials and other building equipment will also be stored temporarily on the ground along this route. These activities will lead to local habitat transformation and disturbance, including disruption of breeding activity, of bird species present. While none of the Red Data species are expected to be impacted by this, many non-threatened taxa are. These disturbances would be most likely when construction coincides with breeding activity. Apart from minimising the footprint of construction activities, the non-threatened status of the taxa involved does not warrant any other mandatory mitigation measures. However, the impact could be minimised by scheduling construction to occur during the non-breeding season of most of the species involved. Examination of the Median Breeding Index indicates that the best period for construction would be between April and July (inclusive) and the worst period from October to January.

Mitigation measures to reduce potential impacts:

- The footprint of all construction related activities should be restricted to designated areas and minimized wherever practically possible.

4.1.3 Heritage Impacts

Damage or destruction of archaeological and palaeontological heritage

The powerline footprint traverses existing road reserves, degraded farmland and areas formerly disturbed by the residential developments. The associated distribution centre footprints are located on degraded farmland, areas formerly disturbed by the residential developments and relatively undisturbed patches of open veld. The Rayton, Lilyvale Hillandale and Bayswater farms north of Bloemfontein represent historically as well as archaeologically significant landscapes. The proposed route options however circumvent these areas, which also include the Seven Dams Conservancy and the Botanical Gardens.

A pedestrian survey revealed no evidence of in situ Stone Age archaeological material, capped or distributed as surface scatters on the landscape. There are also no indications of rock art, graves or historically significant structures older than 60 years within the proposed footprints. It is advised that both options for the Hillandale loop-in represents low potential impact for underground finds because it largely traverses previously disturbed areas. As far as the archaeological heritage is concerned, the power line and distribution centre footprints are considered to be of low archaeological significance and are assigned a site rating of Generally Protected C. The proposed development may proceed with no further assessments required.

Mitigation measures to reduce potential impacts:

- Restrict all development work to the proposed project footprint as this was the area assessed during the site inspection.
- If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Itumeleng Masiteng/Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required.

4.1.4 Visual Impact Assessment

Potential visual impact on sensitive visual receptors, located within a 5 km radii of the Harvard Powerline

It is envisaged that the structures, will be highly visible from a two kilometre (2 km) radius especially for commuters and residence within this radius. The study area contains elevated areas and built up environments minimizing the visual impact to 5 km. Beyond the five kilometre buffer the proposed project will be visible from elevated areas such as koppies. It is anticipated that should the applicant decide to implement the recommended mitigation measures the overall visual impact of the Harvard Powerline will be moderate. The Visual Impact of Layout Alternative 1 and 2 is more or less the same; however, Alternative one is less visible within a two kilometre (2 km) radius. The Specialist would thus recommend that the Applicant construct Alternative 1.

Mitigation measures to reduce potential impacts:

- Minimise vegetation clearance to ensure that visual absorption capacity is not destroyed;
- A site layout plan must be submitted prior to construction to ensure infrastructure is placed in such a manner that minimum vegetation is cleared;
- Consolidate infrastructure as much as possible and make use of already disturbed areas rather than pristine sites, wherever possible;
- Lighting:
    - Make use of downward directional lighting fixtures;
    - Make use of minimum lumen or wattage in fixtures;
    - Make use of down-lighters, or shielded fixtures;
    - Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.

Construction Phase Mitigation:

- Ensure vegetation is not unnecessarily cleared or removed during the construction period;
- Reduce the construction period through careful logistical planning and productive implementation of resources;
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads;
- Ensure that rubble, litter, and disused construction materials are appropriately stored and then disposed regularly at licensed waste facilities;
- Reduce and control construction dust through the use of approved dust suppression techniques as and when required;

- Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting;
- Ensure that all areas are properly rehabilitated

4.2 OPERATIONAL PHASE

Once the construction of the transmission line and associated sub-stations has been completed, the following potential impacts will be associated with to the operational phase.

4.2.1 Ecological Impacts

Continued destruction/transformation of semi-natural and natural vegetation within the transmission line route corridor associated with the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type and the Winburg Grassy Shrubland (Gh 7) vegetation type

Once the construction of the proposed transmission line has been completed, management and maintenance processes required by the applicant could result in additional undesired surface impacts on the semi-natural and natural areas. As these remaining semi-natural and natural areas are very important to the habitat persistence and ecological functionality of the surrounding ecosystem, the significance of these potential impacts on the vegetation will be medium.

Mitigation measures to reduce potential impacts:

- No physical maintenance (removal or defoliation by means of cutting or burning) is allowed on the natural vegetation present inside the proposed transmission line route servitude.
- Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible.
- Significant care must be taken to ensure that no significant woody shrubs or trees are removed from the route corridor during the construction or operational/maintenance phase of the proposed project development. If any removal of woody shrubs or trees individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation.
- It is recommended that Alternative 2 for the proposed transmission line route corridor rather be followed in order to minimise the impact on remaining natural area of the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type.

Continued destruction/transformation of a Critical Biodiversity Area associated with the transmission line route corridor

Once the construction of the proposed transmission line has been completed, management and maintenance processes required by the applicant could result in additional undesired surface impacts on the Critical Biodiversity Area (CBA). As this natural, undisturbed vegetation of the CBA plays a very significant

role in faunal and floral migration and dispersion activities, the significance of these potential impacts on the CBA will be high.

Mitigation measures to reduce potential impacts:

- No physical maintenance (removal or defoliation by means of cutting or burning) is allowed on the natural vegetation present inside the proposed transmission line route servitude.
- Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible. An existing CENTLEC 33 kV transmission line already runs through a portion of the CBA and the proposed transmission line will be developed directly adjacent to it. This could enable the utilisation of exiting service roads.
- Significant care must be taken to ensure that no significant woody shrubs or trees are removed from the route corridor during the construction or operational/maintenance phase of the proposed project development. If any removal of woody shrubs or trees individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation.

Continued destruction/damage to Red Data Listed or protected species individuals associated with the transmission line route corridor and sub-station footprints

Once the construction of the proposed transmission line has been completed, management and maintenance processes required by the applicant could result in additional undesired surface impacts which could destroy/damage important species individuals. Although a Red Data Listed species was identified, its presence and distribution extent is low. The significance of these potential impacts on the species individuals will therefore be medium.

Mitigation measures to reduce potential impacts:

- No physical maintenance (removal or defoliation by means of cutting or burning) is allowed on the natural vegetation present inside the proposed transmission line route servitude.
- Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible.
- Significant care must be taken to ensure that no significant species individuals are destroyed or damaged during the operational/maintenance phase of the proposed project development. If any removal of significant species individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation.

Continued surface material erosion

Areas around established pylon footprints and service roads could potentially be prone to significant surface soil erosion due to continued disturbances caused by management/maintenance activities. Due to the large number of pylons to be constructed, the significance of this potential impact will be medium.

Mitigation measures to reduce potential impacts:

- Implement suitable erosion prevention measures at all construction footprints.
- Areas around pylon footprints must be adequately rehabilitated to prevent significant erosion.

Continued alien invasive species establishment

Areas around established pylon footprints and service roads could potentially be prone to significant alien invasive species establishment due to continued disturbances caused by management/maintenance activities. Due to the large number of pylons to be constructed, the significance of this potential impact will be medium.

Mitigation measures to reduce potential impacts:

- Implement suitable alien invasive species prevention measures at all construction footprints.
- Areas around pylon footprints must be adequately rehabilitated to prevent significant alien invasive species establishment.

Continued damage to or impeding of watercourses

Once the construction of the proposed transmission line has been completed, management and maintenance processes required by the applicant could result in additional undesired alteration of watercourse structures or impediment or diversion of flow. The significance of these potential impacts on the watercourses will therefore be high.

Mitigation measures to reduce potential impacts:

- Any impact on the vegetation and watercourse structures or impediment or diversion of flow during management/maintenance processes must be completely avoided.
- No service roads are to be constructed through any watercourses or within the recommended buffer areas.

4.2.2 Avifaunal Impacts

Avifaunal habitat destruction and displacement caused by sub-station development

Construction of each sub-station will entail permanent transformation of existing habitat which include woodland, grassland or agricultural fields into a relative sterile habitat consisting of fences, buildings, steel structures, etc., and the consequent permanent displacement of species which currently utilise the impacted area. Factors potentially contributing to the risk of bird fatalities at the substations include the following.

- Fences may pose a collision risk to birds.
- Insects attracted by security lighting, which is a source of ELP, could attract birds, and this could lead to collisions with project infrastructure. Gaston et al. (2012) recently investigated options for reducing the ecological consequences of ELP. They concluded that the most effective option would probably be to maintain and increase natural unlit areas. Relevant mitigation options in this regard include the following:
    - Maintain and increase natural unlit areas;
    - Security lighting should be installed only where it is absolutely essential;
    - Avoid direct illumination of any substation structures;
    - Reduce the trespass of lighting by using luminaires that prevents light from shining beyond the intended area and eliminates light directed upwards or at the horizontal;
    - Decreasing light intensity will reduce energy consumption and limit both skyglow and the area impacted by high-intensity direct light;
    - Lighting technologies emitting a narrow spectrum of light are likely to have less ecological impact compared to broader spectrum light sources.
- The construction of the access roads could also have a negative impact on birds. Dust suppressants other than pure water should be used only as a last resort, and then only after very careful research were conducted as it could potentially have adverse environmental impacts (Lovich & Ennen 2011; Piechota et al. 2002). The access road should also be carefully designed in order to avoid erosion over the long term and minimise the occurrence of areas where water could collect to create pools.
- Wherever possible, grazing or mechanical methods should be used instead of chemical alternatives to keep the vegetation in check where necessary. In this way the possible

Mitigation measures to reduce potential impacts:

- Maintain and increase natural lit areas following the guidelines provided by Gaston et al. (2012);
- Wherever possible, grazing or mechanical methods should be used instead of chemical alternatives to keep the vegetation in check where necessary.

Positive avifaunal impact caused by sub-station development

New substation habitat will not be suitable for most of the species which utilise the present habitats in the respective footprint areas. The following species occurring in the area are known to build their nests on/in man-made structures and they may attempt to do so at the new substations: Speckled Pigeon R349, White-rumped Swift R415, Little Swift R417, White-throated Swallow R520, Pearl-breasted Swallow R523,Greater Striped Swallow R526, South African Cliff-Swallow R528, Rock Martin R529, Common Myna R758, Cape Glossy Starling R764, House Sparrow R801, and Cape Sparrow R803. While the swallows and martin use mud to construct their nests underneath horizontal/vertical surfaces, others use grass and other material to construct their nest. In certain cases this may interfere with the normal functioning of the used structures or create a fire risk. The Common Myna R758 and House Sparrow R801 are both Category 3 introduced invasive species (National Environmental Management: Biodiversity Act (10 of 2004): Alien and Invasive Species List (2014)).

Mitigation measures to reduce potential impacts:

- Avoid the use of lattice-type structures in order to minimize perching and nesting opportunities;
- Minimize standing water. This will make it more difficult for the swallow species to obtain mud for their nests. It will also help to minimize the risk of large congregations of birds near the substation.
- It is recommended that the new substations should be inspected for nesting activity at least once a month. This can be accomplished during routine maintenance activities.
- Observations at substations suggest that the only effective counter measure against small birds nesting in equipment is to remove the nesting material when it appears (Van Rooyen & Ledger 1999). The same strategy is recommended for the new substation, but only if the nest belongs to one of the species indicated above, and if it interferes with the substation's operation and/or creates a fire risk. In cases where a species other than those indicated above are involved, permission should first be obtained from the local nature conservation authorities. If the surveys for nests are done regularly as recommended above (at least once a month), then it would help minimize the risk of eggs or nestlings being involved.

Avifaunal collision and electrocution caused by transmission line development

Power lines represent a permanent collision hazard to birds. Cases of collisions with electrical infrastructure are known for 20 of the 37 Red Data species occurring in the SAC9Q-block. Most of these species are presently at best transient visitors to the project site and or their risk of colliding with new power lines at the site is considered to be low. The risk is considered to be moderate for the following two species:

- Secretarybird R118 (Vulnerable): Breeding resident. There is at least one breeding pair which utilise the area of the proposed power line. Fatal collision incidents involving power lines have been recorded for this species (Brown & Lawson 1989; Diamond 2008; Diamond et al. 2010; Prinsen et al. 2011; Van Niekerk 2013a; Van Rooyen & Ledger 1999; Vosloo & Van Rooyen 2009b).
- Lanner Falcon R172 (Vulnerable): Breeding resident. This species possibly breed in the study area. They forage over a wide area. Fatal collision and electrocution incidents are known for this species (Anderson 2000; Prinsen et al. 2011; Shaw et al. 2010).

In addition to the above, there are 18 non-threatened species which have a moderate or high risk of colliding with the new power lines. On a daily basis hundreds of doves and pigeons will fly across the lines as they move between urban areas and agricultural land further afield. These movements are expected to occur over most of the length of the power line.

Ducks and geese is another group of birds which is likely to collide with the proposed power line infrastructure, in part because they frequently move about between dusk and dawn. The major drainage lines represent linear movement corridors for these and other species. Where a power line transverses such a feature it represents a collision risk zone. Risk level is a function of site specific characteristics, such as the location of the crossing area relative to feeding and resting areas of these waterbirds. A relatively high collision risk is predicted for the following areas**:**

- Wetlands WL1 and WL2 are isolated wetlands which would retain water for an extended period of time. The current route places the proposed new line dangerously close;
- Where the proposed power line will cross tributaries of the Stinkhoutspruit;
- Where the line transverse the upper catchment of the Renosterspruit tributary at the Noordstad dumping site.
- The area around the proposed Hillandale substation (Northern & Southern Alternatives;)
- Southern Alternative: The area south of the Shell Ultra City.

In addition, frequent waterbird movement is expected across the development zone when ephemeral wetlands in the area are inundated.

There is general agreement amongst researchers that “vertically separated arrays of lines should be avoided as much as possible” (Jenkins et al. 2010). Horizontal designs where conductors are all on the same height is regarded to be saver as it presents a smaller vertical collision zone (Bevanger 1994; Drewitt & Langston 2008).

The removal of earth wires has been shown to reduce collision incidents substantially (Bevanger 1994; Bevanger & Brøseth 2001; Brown et al. 1987). However, Bloemfontein is located in a "severe" lightning strike risk zone (Gijben 2012), which would necessitate the use of earth wires.

Another option is to mark earth wires and/or conductors in order to make them more visible to birds, e.g. by using bird flight diverters. Dynamic (including most "suspended") devices ("bird flappers") have moving parts and is more visible to birds, but unfortunately they are also less durable than static devices and may damage the power line to which it is attached (Vosloo & Van Rooyen 2009b).

In terms of the two Hillandale alternatives, the Southern Alternative is preferred as it is much shorter than the Northern Alternative. The only way to mitigate the situation at wetlands WL1 and WL2 is to reroute the power line in such a way that it will be at least 100 m from these isolated wetlands;

Mitigation measures to reduce potential impacts:

- The proposed new power line should be of a horizontal design where conductors are all on the same height.
- In addition, bird flight diverters or other suitable devices should be fitted to the earth wires of power line sections crossing major drainage lines following the guidelines provided by Jenkins et al. (2010).
- The Southern Alternative is preferred to the Northern Alternative.
- With regards to wetlands WL1 and WL2, reroute the proposed power line in a way that it does not approach them closer than 100 m.
- Electrocution risk is primarily a function of power line tower design and bird body size and behaviour (Guil et al. 2011; Lehman et al. 2007; Van Rooyen 2003). Since the best strategy for avoiding bird electrocution is to use low risk power line tower designs (Van Rooyen 2003), it is recommended that such designs must be used for the proposed project following available guidelines (e.g. Ferrer 2012; Guil et al. 2011; Van Rooyen 2003).

Positive avifaunal impact caused by transmission line development

At least 19 of the species occurring in the SACQ9-block are known to breed on power line pylons and wires. Nesting activity on pylons can potentially cause flash-overs. Removal of nests is only recommended as a last resort because the nest owners will frequently return and rebuild the nest (Anderson 2013). Alternative mitigation strategies include trimming of excessive nesting material, insulation of conductors, and the provision of an artificial nest platform (Anderson 2013).

4.3 CUMULATIVE IMPACTS

A number of transmission lines are present within the broader area as this is required for adequate electricity distribution within the metropolitan municipal area. The new transmission line will run parallel alongside an existing Eskom transmission line for the large majority of the proposed route. As discussed earlier, it will also then join up with an existing CENTLEC 33 kV transmission line inside the CBA from where it will run parallel alongside the existing line for virtually the entire route section until it exits the CBA.

None of the identified potential ecological impacts are rated as significantly high after mitigation measures have been implemented and due to the proposed transmission line being situated in close proximity to already existing lines at various sections, it should not significantly contribute in a cumulative way to the identified potential ecological impacts.

Destruction of natural vegetation within the sub-station footprints will add cumulatively to development footprint destruction of the endangered vegetation types and is assigned a medium rating.

Earlier surveys for dead birds under an existing 132 kV power line running parallel to the Havard-Cecilia power line revealed the carcasses of several species, including Red Data taxa (Van Niekerk 2013a). It is likely that the proposed new power line would moderately increase the potential for collision incidents due to it running mostly parallel to an existing line.

5. RISK RATINGS OF POTENTIAL IMPACTS

The following section provides the Environmental Risk as well as the Environmental Significance Ratings for the potential environmental impacts for the proposed project both before and after implementation of the recommended mitigation measures.

5.1 CONSTRUCTION PHASE

Table 3: Environmental Risk and Significance Ratings

	Proposed project	No-Go Alternative
Identified Environmental Impacts	**Destruction/transformation of vegetation of pre-existing transformed and disturbed cultivated lands and road servitudes within the transmission line route corridor associated with the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Very Low (2)	-
Duration of impact:	Short term (2)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	Very Low (1)	-
Degree to which the impact can be reversed:	Reversible (1)	-
Probability of occurrence:	Medium probability (3)	-
Cumulative impact prior to mitigation:	Low	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (21)	-

Proposed mitigation:	It is recommended that pylons, as far as practicably possible, be placed within such already transformed areas in order to minimise the impacts on remaining semi-natural and natural vegetation. Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible.	-
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (18)	-
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Destruction/transformation of vegetation of pre-existing transformed and disturbed cultivated lands and road servitudes within the sub-station footprints associated with the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Very Low (2)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Site specific (1)	-

Degree to which local resources are irreplaceable	Very Low (1)	-
Degree to which the impact can be reversed:	Reversible (1)	-
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Low	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (40)	-
Proposed mitigation:	The construction footprint of the sub-stations must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion should take place. Existing roads, farm tracks and service roads in close proximity to the proposed sub-station locations must be used as far as practicably possible. The construction and subsequent operation of the sub-stations must be continually managed in terms of an adequate and approved Environmental Management Programme (EMPr).	
Cumulative impact post mitigation:	Low	-

Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (24)	-
	Proposed project	
Identified Environmental Impacts	**Destruction/transformation of semi-natural and natural vegetation within the transmission line route corridor associated with the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type and the Winburg Grassy Shrubland (Gh 7) vegetation type**	
	Alternative 1	**Alternative 2**
Magnitude of Impact	Medium (6)	Low (4)
Duration of impact:	Medium term (3)	Medium term (3)
Extent of the impact	Local (2)	Local (2)
Degree to which local resources are irreplaceable	Moderate (3)	Low (2)
Degree to which the impact can be reversed:	Moderate (3)	Moderate (3)
Probability of occurrence:	Medium probability (3)	Medium probability (3)
Cumulative impact prior to mitigation:	Medium	Low

Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (51)	Medium (42)
Proposed mitigation:	It is recommended that the amount of pylons to be placed within these natural areas be restricted and pylons rather be placed in transformed areas, as far as practicably possible. This must be done in order to minimise impacts on the habitat and ecological functionality of the natural areas. It is recommended that the Steel Monopole tower type be implemented in the natural areas as far as practicably possible due to its smaller physical surface footprint size and subsequent reduced impact on the vegetation. Pylon construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised pylon footprint expansion should take place. Once the proposed transmission line layout designs have been finalised by the applicant, an ecological walkthrough of the final pylon footprint positions must be conducted in order to identify any potentially significant species individuals which would require relocation. These walkthrough and potential relocation activities must be completed prior to the commencement of and construction processes.	It is recommended that Alternative 2 for the proposed transmission line route corridor rather be followed in order to minimise the impact on remaining natural area of the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type.

	No physical maintenance (removal or defoliation by means of cutting or burning) is allowed on the natural vegetation present inside the proposed transmission line route servitude. Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible. Significant care must be taken to ensure that no significant woody shrubs or trees are removed from the route corridor during the construction or operational/maintenance phase of the proposed project development. If any removal of woody shrubs or trees individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation. It is recommended that Alternative 2 for the proposed transmission line route corridor rather be followed in order to minimise the impact on remaining natural area of the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type.	
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation	Low (28)	Low (22)

(Low, Medium, Medium-High, High, or Very-High)		
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Destruction/transformation of natural vegetation within the sub-station footprints associated with the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Medium (6)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Local (2)	-
Degree to which local resources are irreplaceable	Moderate (3)	-
Degree to which the impact can be reversed:	Moderate (3)	-
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Medium	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium-High (76)	-

Proposed mitigation:	The construction footprint of the sub-stations must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion should take place. Once the sub-station designs have been finalised by the applicant, an ecological walkthrough of the final sub-station footprints must be conducted in order to identify any potentially significant species individuals which would require relocation. These walkthrough and potential relocation activities must be completed prior to the commencement of any construction processes. Existing roads, farm tracks and service roads in close proximity to the proposed sub-station locations must be used as far as practicably possible. The construction and subsequent operation of the sub-stations must be continually managed in terms of an adequate and approved Environmental Management Programme (EMPr).	
Cumulative impact post mitigation:	Medium	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (72)	-

	Proposed project	No-Go Alternative
Identified Environmental Impacts	**Destruction/transformation of a Critical Biodiversity Area associated with the transmission line route corridor**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	High (8)	-
Duration of impact:	Medium term (3)	-
Extent of the impact	Local (2)	-
Degree to which local resources are irreplaceable	High (4)	-
Degree to which the impact can be reversed:	Moderate (3)	-
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium-High (80)	-
Proposed mitigation:	It is recommended that the amount of pylons to be placed within the CBA be restricted, as far as practicably possible, in order to minimise impacts on the habitat and ecological functionality of the natural areas.	

	It is instructed that only the Steel Monopole tower type be implemented in the CBA due to its smaller physical surface footprint size and subsequent reduced impact on the vegetation. Pylon construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised pylon footprint expansion should take place. Pylon placement within any significant rocky outcrops of the Bloemfontein Karroid Shrubland (Gh 8) vegetation type to be prevented as far as practicably possible. No site camp footprint to be established within the CBA and the entire construction phase planning and layout which is to occur within the CBA to firstly be reviewed and approved by a suitably qualified, registered and experienced ecologist in order to ensure minimal impact is achieved. Once the proposed transmission line layout designs have been finalised by the applicant, an ecological walkthrough of the final pylon footprint positions within the CBA must be conducted in order to ensure that no Bloemfontein Karroid Shrubland (Gh 8) vegetation type rocky outcrops will be significantly impacted upon and to identify any potentially significant

	species individuals which would require relocation. These walkthrough and potential relocation activities must be completed prior to the commencement of and construction processes. No physical maintenance (removal or defoliation by means of cutting or burning) is allowed on the natural vegetation present inside the proposed transmission line route servitude. Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible. An existing CENTLEC 33 kV transmission line already runs through a portion of the CBA and the proposed transmission line will be developed directly adjacent to it. This could enable the utilisation of exiting service roads. Significant care must be taken to ensure that no significant woody shrubs or trees are removed from the route corridor during the construction or operational/maintenance phase of the proposed project development. If any removal of woody shrubs or trees individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation.

	The noise impact and disturbance of wild animals and game must be adequately managed and kept to a minimum during construction.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (57)	-
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Destruction/damage to Red Data Listed or protected species individuals associated with the transmission line route corridor and sub-station footprints**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Low (4)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	High (4)	-
Degree to which the impact can be reversed:	Low (4)	-
Probability of occurrence:	Medium probability (3)	-

Cumulative impact prior to mitigation:	Low	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (54)	-
Proposed mitigation:	Pylon construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised pylon footprint expansion should take place. Once the proposed transmission line layout designs have been finalised by the applicant, an ecological walkthrough of the final pylon footprint positions must be conducted in order to identify any potentially significant species individuals which would require relocation. These walkthrough and potential relocation activities must be completed prior to the commencement of any construction processes. The construction footprint of the sub-stations must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion should take place. Once the proposed sub-station designs have been finalised by the applicant, an ecological walkthrough of the final sub-station footprints must be conducted in order to identify any potentially significant species individuals	-

	which would require relocation. These walkthrough and potential relocation activities must be completed prior to the commencement of any construction processes. Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (36)	-
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Surface material erosion**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Low (4)	-
Duration of impact:	Short term (2)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are	Very low (1)	-

irreplaceable		
Degree to which the impact can be reversed:	High (2)	-
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Low	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (40)	-
Proposed mitigation:	Implement suitable erosion prevention measures at all construction footprints. Areas around pylon footprints must be adequately rehabilitated to prevent significant erosion.	-
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (20)	-

	Proposed project	No-Go Alternative
Identified Environmental Impacts	**Alien invasive species establishment**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Medium (6)	-
Duration of impact:	Medium term (3)	-
Extent of the impact	Local (2)	-
Degree to which local resources are irreplaceable	Very low (1)	-
Degree to which the impact can be reversed:	High (2)	-
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (56)	-
Proposed mitigation:	Implement suitable alien invasive species prevention measures at all construction footprints.	-

	Areas around pylon footprints must be adequately rehabilitated to prevent significant alien invasive species establishment.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (28)	-
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Damage to or impeding of watercourses**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	High (8)	-
Duration of impact:	Medium term (3)	-
Extent of the impact	Regional (3)	-
Degree to which local resources are irreplaceable	Moderate (3)	-
Degree to which the impact can be reversed:	Moderate (3)	-
Probability of occurrence:	Medium probability (3)	-

Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (60)	-
Proposed mitigation:	Any impact on the vegetation and watercourse structures or impediment or diversion of flow must be completely avoided. Transmission line design and layout must therefore ensure the continued ecological functionality and unimpeded flow of the watercourse after construction completion. Care must be taken to ensure that no woody shrubs or trees are removed from the watercourse areas during the construction or operational/maintenance phase of the proposed project development. If any removal of woody shrubs or trees individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation. Adequate buffer areas to be implemented around identified watercourses. No access or construction routes or any physical footprint impacts are to be made within the recommended buffer areas without the prior inspection and approval by a suitably qualified, registered and experienced ecologist..	-

	No pylons to be constructed within the recommended buffer areas. If any pylon construction is required within the buffer areas, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the proposed footprint areas and provide recommendations on their management. Any areas around the watercourses potentially impacted by the construction of the transmission line must be to be adequately rehabilitated.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (38)	-
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Avifaunal habitat destruction and displacement caused by sub-station development**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Low (4)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Site specific (1)	-

Degree to which local resources are irreplaceable	Very low (1)	-
Degree to which the impact can be reversed:	Not reversible (5)	-
Probability of occurrence:	Low probability (2)	-
Cumulative impact prior to mitigation:	Low	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (32)	-
Proposed mitigation:	The footprint of all construction related activities should be restricted to designated areas and minimized wherever practically possible.	-
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (28)	-

	Proposed project	No-Go Alternative
Identified Environmental Impacts	**Avifaunal disturbance and displacement caused by transmission line development**	
	Alternative 1	**Alternative 2**
Magnitude of Impact	Low (4)	Low (4)
Duration of impact:	Short term (2)	Short term (2)
Extent of the impact	Local (2)	Local (2)
Degree to which local resources are irreplaceable	Local (2)	Local (2)
Degree to which the impact can be reversed:	High potential (2)	High potential (2)
Probability of occurrence:	Low probability (2)	Low probability (2)
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (24)	Low (24)
Proposed mitigation:	The footprint of all construction related activities should be restricted to designated areas and minimized wherever practically possible.	The footprint of all construction related activities should be restricted to designated areas and minimized wherever

		practically possible.
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (24)	Low (24)
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Damage or destruction of archaeological and palaeontological heritage**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Very low (2)	-
Duration of impact:	Medium term (3)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	Very low (1)	-
Degree to which the impact can be reversed:	High (2)	-
Probability of occurrence:	Medium probability (3)	-
Cumulative impact prior to	Low	-

mitigation:		
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (27)	-
Proposed mitigation:	Restrict all development work to the proposed project footprint as this was the area assessed during the site inspection. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Itumeleng Masiteng/Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required.	-
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High,	Low (18)	-

or Very-High)		
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Potential visual impact on sensitive visual receptors, located within a 5km radii of the Harvard Powerline**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Medium (6)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Local (4)	-
Degree to which local resources are irreplaceable	Low (2)	-
Degree to which the impact can be reversed:	Moderate (3)	-
Probability of occurrence:	Definite (5)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	High(100)	-

Proposed mitigation:	Minimise vegetation clearance to ensure that visual absorption capacity is not destroyed; A site layout plan must be submitted prior to construction to ensure infrastructure is placed in such a manner that minimum vegetation is cleared; Consolidate infrastructure as much as possible and make use of already disturbed areas rather than pristine sites, wherever possible; Lighting: Make use of downward directional lighting fixtures; Make use of minimum lumen or wattage in fixtures; Make use of down-lighters, or shielded fixtures; Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes. Construction Phase Mitigation: Ensure vegetation is not unnecessarily cleared or removed during the construction period; Reduce the construction period through careful logistical planning and	-

	productive implementation of resources; Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads; Ensure that rubble, litter, and disused construction materials are appropriately stored and then disposed regularly at licensed waste facilities; Reduce and control construction dust through the use of approved dust suppression techniques as and when required; Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting; Ensure that all areas are properly rehabilitated.	
Cumulative impact post mitigation:	Medium	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (54)	-

5.2 OPERATIONAL PHASE

Table 4: Environmental Risk and Significance Ratings

	Proposed project	No-Go Alternative
Identified Environmental Impacts	**Continued destruction/transformation of semi-natural and natural vegetation within the transmission line route corridor associated with the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type and the Winburg Grassy Shrubland (Gh 7) vegetation type**	
	Alternative 1	**Alternative 2**
Magnitude of Impact	Medium (6)	Low (4)
Duration of impact:	Medium term (3)	Medium term (3)
Extent of the impact	Local (2)	Local (2)
Degree to which local resources are irreplaceable	Moderate (3)	Low (2)
Degree to which the impact can be reversed:	Moderate (3)	Moderate (3)
Probability of occurrence:	Medium probability (3)	Medium probability (3)
Cumulative impact prior to mitigation:	Medium	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (51)	Medium (42)

Proposed mitigation:	No physical maintenance (removal or defoliation by means of cutting or burning) is allowed on the natural vegetation present inside the proposed transmission line route servitude. Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible. Significant care must be taken to ensure that no significant woody shrubs or trees are removed from the route corridor during the construction or operational/maintenance phase of the proposed project development. If any removal of woody shrubs or trees individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation.	It is recommended that Alternative 2 for the proposed transmission line route corridor rather be followed in order to minimise the impact on remaining natural area of the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type.
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (28)	Low (22)

	Proposed project	No-Go Alternative
Identified Environmental Impacts	**Continued destruction/transformation of a Critical Biodiversity Area associated with the transmission line route corridor**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	High (8)	-
Duration of impact:	Medium term (3)	-
Extent of the impact	Local (2)	-
Degree to which local resources are irreplaceable	High (4)	-
Degree to which the impact can be reversed:	Moderate (3)	-
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium-High (80)	-
Proposed mitigation:	No physical maintenance (removal or defoliation by means of cutting or burning) is allowed on the natural vegetation present inside the proposed transmission line route servitude.	

	Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible. An existing CENTLEC 33 kV transmission line already runs through a portion of the CBA and the proposed transmission line will be developed directly adjacent to it. This could enable the utilisation of exiting service roads. Significant care must be taken to ensure that no significant woody shrubs or trees are removed from the route corridor during the construction or operational/maintenance phase of the proposed project development. If any removal of woody shrubs or trees individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (57)	-

	Proposed project	No-Go Alternative
Identified Environmental Impacts	**Continued destruction/damage to Red Data Listed or protected species individuals associated with the transmission line route corridor and sub-station footprints**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Low (4)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	High (4)	-
Degree to which the impact can be reversed:	Low (4)	-
Probability of occurrence:	Medium probability (3)	-
Cumulative impact prior to mitigation:	Low	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (54)	-
Proposed mitigation:	No physical maintenance (removal or defoliation by means of cutting or burning) is allowed on the natural vegetation present inside the proposed transmission line route servitude.	

	Existing roads, farm tracks and service roads of existing lines running in close proximity to the proposed transmission line route must be used as far as practicably possible. Significant care must be taken to ensure that no significant species individuals are destroyed or damaged during the operational/maintenance phase of the proposed project development. If any removal of significant species individuals is required, a suitably qualified, registered and experienced ecologist must be assigned to firstly inspect the individuals and provide recommendations on their management or potential removal or the possibility of relocation.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (36)	-

	Proposed project	No-Go Alternative
Identified Environmental Impacts	**Continued surface material erosion**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Low (4)	-
Duration of impact:	Short term (2)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	Very low (1)	-
Degree to which the impact can be reversed:	High (2)	-
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Low	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (40)	-
Proposed mitigation:	Implement suitable erosion prevention measures at all construction footprints.	-

	Areas around pylon footprints must be adequately rehabilitated to prevent significant erosion.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (20)	-
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Continued alien invasive species establishment**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Medium (6)	-
Duration of impact:	Medium term (3)	-
Extent of the impact	Local (2)	-
Degree to which local resources are irreplaceable	Very low (1)	-
Degree to which the impact can be reversed:	High (2)	-
Probability of occurrence:	High probability (4)	-

Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (56)	-
Proposed mitigation:	Implement suitable alien invasive species prevention measures at all construction footprints. Areas around pylon footprints must be adequately rehabilitated to prevent significant alien invasive species establishment.	-
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (28)	-
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Continued damage to or impeding of watercourses**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	High (8)	-

Duration of impact:	Medium term (3)	-
Extent of the impact	Regional (3)	-
Degree to which local resources are irreplaceable	Moderate (3)	-
Degree to which the impact can be reversed:	Moderate (3)	-
Probability of occurrence:	Medium probability (3)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (60)	-
Proposed mitigation:	Any impact on the vegetation and watercourse structures or impediment or diversion of flow during management/maintenance processes must be completely avoided. No service roads are to be constructed through any watercourses or within the recommended buffer areas.	-
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation	Low (38)	-

(Low, Medium, Medium-High, High, or Very-High)		
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Avifaunal habitat destruction and displacement caused by sub-station development**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Low (4)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	Very low (1)	-
Degree to which the impact can be reversed:	Not reversible (5)	-
Probability of occurrence:	Low probability (2)	-
Cumulative impact prior to mitigation:	Low	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (32)	-

Proposed mitigation:	Maintain and increase natural lit areas following the guidelines provided by Gaston et al. (2012); Wherever possible, grazing or mechanical methods should be used instead of chemical alternatives to keep the vegetation in check where necessary.	-
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (28)	-
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Positive avifaunal impact caused by sub-station development**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Low (+4)	-
Duration of impact:	-	-
Extent of the impact	-	-
Degree to which local resources are irreplaceable	-	-

Degree to which the impact can be reversed:	-	-
Probability of occurrence:	-	-
Cumulative impact prior to mitigation:	-	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive	-
Proposed mitigation:	Avoid the use of lattice-type structures in order to minimize perching and nesting opportunities; Minimize standing water. This will make it more difficult for the swallow species to obtain mud for their nests. It will also help to minimize the risk of large congregations of birds near the substation. It is recommended that the new substations should be inspected for nesting activity at least once a month. This can be accomplished during routine maintenance activities. Observations at substations suggest that the only effective counter measure against small birds nesting in equipment is to remove the nesting material when it appears (Van Rooyen & Ledger 1999). The same strategy is	-

	recommended for the new substation, but only if the nest belongs to one of the species indicated above, and if it interferes with the substation's operation and/or creates a fire risk. In cases where a species other than those indicated above are involved, permission should first be obtained from the local nature conservation authorities. If the surveys for nests are done regularly as recommended above (at least once a month), then it would help minimize the risk of eggs or nestlings being involved.	
Cumulative impact post mitigation:	-	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive	-
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Avifaunal collision and electrocution caused by transmission line development**	
	Alternative 1	**Alternative 2**
Magnitude of Impact	Medium (6)	Medium (6)
Duration of impact:	Permanent (5)	Permanent (5)
Extent of the impact	Local (2)	Local (2)

Degree to which local resources are irreplaceable	Low (2)	Low (2)
Degree to which the impact can be reversed:	Low (4)	Low (4)
Probability of occurrence:	High probability (4)	High probability (4)
Cumulative impact prior to mitigation:	Medium	Medium
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium-High (76)	Medium-High (76)
Proposed mitigation:	The proposed new power line should be of a horizontal design where conductors are all on the same height. In addition, bird flight diverters or other suitable devices should be fitted to the earth wires of power line sections crossing major drainage lines following the guidelines provided by Jenkins et al. (2010). The Southern Alternative is preferred to the Northern Alternative. With regards to wetlands WL1 and WL2, reroute the proposed power line in a way that it does not approach them closer than 100 m.	The proposed new power line should be of a horizontal design where conductors are all on the same height. In addition, bird flight diverters or other suitable devices should be fitted to the earth wires of power line sections crossing major drainage lines following the guidelines provided by Jenkins et al. (2010). The Southern Alternative is preferred to the Northern

	Electrocution risk is primarily a function of power line tower design and bird body size and behaviour (Guil et al. 2011; Lehman et al. 2007; Van Rooyen 2003). Since the best strategy for avoiding bird electrocution is to use low risk power line tower designs (Van Rooyen 2003), it is recommended that such designs must be used for the proposed project following available guidelines (e.g. Ferrer 2012; Guil et al. 2011; Van Rooyen 2003).	Alternative. With regards to wetlands WL1 and WL2, reroute the proposed power line in a way that it does not approach them closer than 100 m.
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (57)	Medium (57)
	Proposed project	**No-Go Alternative**
Identified Environmental Impacts	**Positive avifaunal impact caused by transmission line development**	**The proposed development will not take place and as such this impact will not occur**
Magnitude of Impact	Low (+4)	-
Duration of impact:	-	-
Extent of the impact	-	-
Degree to which local resources are irreplaceable	-	-

Degree to which the impact can be reversed:	-	-
Probability of occurrence:	-	-
Cumulative impact prior to mitigation:	-	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive	-
Proposed mitigation:	-	-
Cumulative impact post mitigation:	-	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive	-

6. CONCLUSIONS

After careful consideration of the findings and outcomes during the Basic Assessment process, Enviroworks is of the opinion that based on all information that was captured in this report; the proposed development will not lead to unacceptable impacts or fatal flaws and should be considered plausible in the framework of NEMA. It is indicated that the majority of the anticipated impacts are rated as low to medium while the impacts rated as medium-high (CBA destruction) and (avifaunal collision and electrocution) can be adequately addressed through the various mitigation measures and reduced to an acceptable level.

Although Alternative 2 is recommended in terms of the Ecological and Avifaunal Impact Assessments in order to minimise the impact on remaining natural area of the endangered Bloemfontein Dry Grassland (Gh 5) vegetation type Alternative 1 is also ecologically acceptable and is also more acceptable from a social and visual impact point of view and will have the least significant negative effect on relevant landowners. Alternative 1 is therefore more acceptable and preferred by the majority of relevant landowners. Enviroworks therefore recommend that the preferred route layout Alternative 1 for the proposed transmission line be considered and approved.

A comprehensive Public Participation Process will be conducted to provide the public with the opportunity to comment on the draft Basic Assessment Report in order to provide all relevant parties with adequate time for consideration. All comments/feedback and recommendations received will be included in the final PPP Report in Appendix E to be submitted along with final Basic Assessment Report for decision making by the competent authority.