

Eskom United 88kV line
 DEA Ref nr 14/12/16/3/3/1/637
Basic Assessment Report
Executive Summary
Compiled August 2012

1. Background

Eskom Holdings SOC, Distribution Northern Region, (the Applicant) commissioned Texture Environmental Consultants (the Environmental Assessment Practitioner) to undertake an Environmental Impact Assessment for the proposed project.

This current Environmental Impact Assessment application is part of a broader scope of works to strengthen supply to the Boschmansfontein Colliery. Currently the network is experiencing under voltages and is incapable of handling additional loads due to the contingency constraints of the network. The broader solution to the above is to construct the following:

Broader Project Description

- Dismantle the existing 88kV Mink line between United and Grootpan substation on feeder No 2 GRO/KRO from poles 1-20.
- Build a new double circuit line on the same route with a Chickadee conductor.
- Disconnect feeder no 1 new line and connect onto the new 132kV feeder bay and at United substation.
- Deviate the two existing 88kV Lines (1GRO/KRO & 2GRO/KRO) from the steel gantry to pole no 2.
- Reconnect feeders 1&2 to extend 88kV gantry in the substation and at the existing lines at pole 20.
- Tap off, at pole 20 on line no 1, from the Grootpan-United 88kV line with a +-200m Chickadee line.

Activity applied for in this EIA:

- Tap off, at pole 20 on line no 1, from the Grootpan-United 88kV line with a +-200m Chickadee line.

1.1 Locality and Regional Context

This application is for the construction of a 88kV interconnector Chickadee powerline, between United Substation and the existing Grootpan-United line, east of Ogies in the Emalahleni Local Municipality in Mpumalanga Province. The study area is very small and is situated inside the fenced-off property of Boschmansfontein Colliery. The study area for the proposed powerline servitude runs approximately north-south over a very short distance of 200m. The servitude links between the existing United Substation and the existing Grootpan-United powerline. Two alternative routes are considered for the power line.

The affected properties for the **proposed Route Alternatives 1 and 2** are the farms Tweefontein 13 IS RE and Boschmansfontein 12 IS RE in the Emalahleni Local Municipality in the Mpumalanga Province. The study area is situated on the 1:50 000 topographical base maps 2629AA. The alternatives for the project are found at approximately:

United Sub-station:

Longitude (Degrees Decimal Minutes)	Latitude (Degrees Decimal Minutes)
29° 7.346'E	26° 2.708'S

Proposed Alternative 1 Route (121.8m):

Intervals	Longitude (Degrees Decimal Minutes)	Latitude (Degrees Decimal Minutes)
1 Start at sub	29° 7.336'E	26° 2.725'S
2 end	29° 7.305'E	26° 2.785'S

Alternative 2 Route (162.6m):

Intervals	Longitude (Degrees Decimal Minutes)	Latitude (Degrees Decimal Minutes)
1 Start at sub	29° 7.358'E	26° 2.734'S
2 (bend)	29° 7.328'E	26° 2.794'S
3 end	29° 7.305'E	26° 2.785'S

2 Legal Requirements

Application for authorisation, in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010, is submitted to the National Department of Environmental Affairs (DEA). The Environmental Impact Assessment Regulations were published on 18 June 2010 in Government Notice No. R.543 and relevant to this project are the activities, which are listed in Listing Notice 1, that require a Basic Assessment (BA) to be conducted.

The following listed activities are relevant to this project:

Relevant notice:	Activity No	Description of each listed activity as per project description:
R 544 of 18 June 2010	10	The construction of facilities or infrastructure for the distribution of electricity outside urban areas with a capacity of 88kV.

3. Study approach

The approach followed by the consultants was based on the specifications for the undertaking of a Basic Assessment as provided in the document "Companion to the EIA Regulations, Integrated Environmental Management Guideline Series 5, Department of Environmental Affairs, 2010".

The study approach followed by the Consultants, in short, entailed the following steps:

- Preliminary **site investigations**, to determine the scope of works of the project and to familiarise with the site, were done in June 2012.
- Further site investigations were done by the EAPs and Eskom in June-July 2012.
- **An application for a Basic Assessment was submitted to DEA** and the project was issued with DEA reference number 14/12/16/3/3/1/637.
- Specialist **ecological input** was obtained to investigate the flora, fauna and the general biophysical environment in an attempt to identify the potential impacts of the project.
- The proposed development is not covered by the National Heritage Resources Act, which incorporates heritage impact assessments in the Environmental Impact Assessment process. A **Heritage Impact Assessment** was therefore not conducted.
- Input from an **avifauna specialist** was also obtained to determine the impact of the proposed project on birds.
- The first phase of the **Public Participation Programme (PPP)** started in **June 2012 and continued until August 2012**. It included the identification of landowners and key stakeholders, the distribution of **information letters** with request for comment, as well as **advertising of the project in the press and on site**.
- A **draft Basic Assessment Report** was compiled with the main aim to identify issues, potential impacts and potential alternatives associated with this project. It included a description of the status quo of all relevant environmental components as well as the proceedings of the PPP and communication with registered Interested & Affected Parties (IAPs).
- In addition, An **Environmental Management Programme (EMPr)** was compiled to ensure that
 - mitigation measures are identified and implemented to avoid or minimise the expected negative environmental impact and enhance the potential positive impact associated with the project;
 - the developer, construction workers and the operational and maintenance staff are well acquainted with their responsibilities in terms of the environment;
 - communication channels to report on environment related issues are in place.
- On **23 August 2012 the draft Basic Assessment Report was submitted** for comment to:
 - Regional Department of Water Affairs: Water Resources & Water Quality Management
 - South African Heritage Resources Agency

- Mpumalanga Department of Economic Development, Environment and Tourism: Environmental Services
 - Mpumalanga Department of Agriculture, Forestry and Fisheries: Land Use and Soil Management
 - Mpumalanga Department of Mineral Resources
 - SA National Road Agency Ltd
 - Mpumalanga Department of Public Works, Roads And Transport
 - Mpumalanga Department of Rural Development and Land Reform
 - Department of Cooperative Governance, Human Settlement and Traditional Affairs
 - Department of Health
 - Agri Mpumalanga/ Mpumalanga Landbou
 - Mpumalanga Tourism and Parks Agency
 - Endangered Wildlife Trust
 - Xstrata Coal SA
 - Nkangala District Municipality
 - Emalahleni Local Municipality
 - Eskom Transmission
 - Eskom Distribution Northern Region
- The **due date for comment to the draft Basic Assessment Report is 3 October 2012.**
 - Subsequently, a **final Basic Assessment Report (BAR)** will be compiled and **submitted to DEA by November 2012.** This report will include all concerns raised to the draft BAR and responses thereto. The Consultants (EAPs) will ensure that all concerns raised are addressed in appropriate detail in the final Basic Assessment Report.

4. Project description

4.1 Need for the project

This current Environmental Impact Assessment application is part of a broader scope of works to strengthen supply to the Boschmansfontein Colliery.

4.2 Project components

Broader Project Description

- Dismantle the existing 88kV Mink line between United and Grootpan substation on feeder No 2 GRO/KRO from poles 1-20.
- Build a new double circuit line on the same route with a Chickadee conductor.
- Disconnect feeder no 1 new line and connect onto the new 132kV feeder bay and at United substation.
- Deviate the two existing 88kV Lines (1GRO/KRO & 2GRO/KRO) from the steel gantry to pole no 2.
- Reconnect feeders 1&2 to extend 88kV gantry in the substation and at the existing lines at pole 20.
- Tap off, at pole 20 on line no 1, from the Grootpan-United 88kV line with a +-200m Chickadee line.

Activity applied for in this EIA:

- Tap off, at pole 20 on line no 1, from the Grootpan-United 88kV line with a +-200m Chickadee line.

In summary, the construction of the project entails the following:

1. Construct an approximately 200m long 88kV interconnector Chickadee powerline, between United Substation and the existing Grootpan-United line;
2. obtain a servitude area for the line.

1. Construct a 88kV chickadee line

It is proposed to construct an approximately 200m 88kV interconnector chickadee line from the existing Grootpan-United line to the existing United substation. The proposed structure for the 88kV powerline, is a monopole steel structure, constructed to 132kV specifications. In general, these pylons could be placed 220-350 meters apart, for the length of the line. For this project, the distances between pylons will be adapted to suit the technical requirements for entering into the substation. The pylons for a power line are between 18 to 30 meters high, depending on the terrain and existing land use. The flatter the terrain, the shorter the pylons to be used. The

conductor attachment height on a pole is 13m (for 20m intermediate poles) and more for longer poles, depending on the pole length. Ground clearances will adhere to OSH-Requirements of 6.3m and 7.5m.

Strain poles have a planting depth of 2m but intermediate pole planting depths varies between 2.6m (for 20m poles) and 3m (for 24m poles) or more depending on the pole length. The pole is not planted in a slab - The pole foundation is dependant on the soil type and varies in size and consists of a 8:1 good soil:cement mix that are compacted in 200mm layers. A concrete cap of 1.2m x 1.2m is cast around the pole to "seal" the soil around the pole from oxygen - to control oxidation or rust on the pole.

Should the pylons be 21m high above ground then the planting depth of the pylon could be calculated as follows: For a pylon that needs to be 21m above ground, the planting depth will be 0.6 meters plus 10% of the height of the pylon above ground = 0.6 meters plus 2.1 meters = pylon is planted 2.7 meters deep. Should stays be needed then the stays will be at a 45° angle to the pylon and planted 21meters from the pylon into the ground.

Where the site is relatively flat, single pylons without stays will be used, except for where the power line has to change direction. Stays will not be used except at turns in the route.

Two Location Alternatives are investigated for the proposed project (Refer to maps in Appendix A1-A3 of the BAR). The **final proposed route** is **Alternative 1** on the farms Tweefontein 13 IS RE and Boschmansfontein 12 IS RE in the Emalahleni Local Municipality in the Mpumalanga Province.

2. **Obtain a servitude area for the proposed line**

Eskom relies on the goodwill of landowners and interested and affected parties to obtain rights of way, or servitudes for power lines. Hence, landowners are consulted during the construction of new power lines and existing landowners are notified when vegetation clearance is due to be performed. Eskom obtains right of way by negotiating a right of way or registering a servitude. A servitude is a real right which Eskom obtained in order to construct its infrastructure upon the affected property and it is registered in the Deeds Office against the title deed of the affected property. The effected owner normally gets compensated for this right according to market related values. Servitude stays effective even if a property is transferred to another owner.

A servitude area is generally a no building area, except for Eskom structures. Usually, normal farming activities may continue in a servitude with the exception that no trees may be planted or structures may be erected. In general, a building restriction of 31 meters is applicable to Eskom 132kV or 88kV power lines, which implies 15,5 meters on either side of the centerline underneath the power line.

5. **Alternatives for the project**

Alternatives for the project have been investigated. The purpose of investigating alternatives is to find the most effective way of meeting the need and purpose of the proposal. This can be attained by enhancing the environmental benefits of the proposed activity, through reducing or avoiding potentially negative impacts.

5.1 **Alternative Activities**

5.1.1 **Electricity Distribution**

It was identified by Eskom that the network performance in the area needs to be improved. This current project is therefore designed to improve the supply of electricity of the Eskom Distribution Network and in specific the supply to Boschmansfontein Colliery. There is no other activity alternative due to the technical constraints of the proposed project.

5.1.2 **Agriculture**

The construction of power lines with the resulting clearance of servitudes can lead to a loss in agricultural land. The proposed construction of the power line will however not impact significantly on any agricultural activity. The following is relevant for this project:

- The land capabilities of the general region, in which the study area falls, are those of good arable and grazing lands. Ground water potential is however unknown, but the area has good rainfall figures along with deep, good soils.
- The general quality and fertility of the soils is good as well as the presence of palatable grazing grasses. The actual carrying capacity of the open areas is relatively high when compared to many other bushveld areas. Infrastructure for commercial agricultural practices is good. The greatest limiting factor for the potential use of the open land as arable or grazing land is the coal mining industry.
- However, the study area itself is very small (approximately 200m by 200m) and is situated inside of the fenced-off grounds of a highly industrialised and developed mine complex. Therefore, the land capabilities (i.e. cultivation (arable ability) and grazing potential) of the study area are very low and totally negligible.
- In general, the impact to agricultural activities of a power line will only be for a limited period during construction. The positions of the pylons will be cleared to construct the power line.
- It is therefore submitted that the servitude area will not interfere with any agricultural activities.
- In addition, Eskom will not own the servitude but will purchase the rights to construct and maintain the lines. Generally a change in land use (from agriculture to other land uses) is not applicable.
- In addition, in terms of the Subdivision of Agricultural Land Act, 1970 (Act 70 of 1970), Section 2(a) Eskom is a statutory body and therefore it is not subjected to the provisions of the Act.

5.1.3 Conservation

The Eastern Highveld Grassland is an endangered veldtype, with only a very low percentage conserved in statutory reserves such as Nooitgedacht Dam and Jericho Dam Nature Reserves. Some protection is found in private reserves such as Holkrans, Kransbank and Morgenstond. Approximately 44% of the vegetation type has been transformed, mainly by cultivation, plantations, mines, urbanisation and the building of dams.

The vegetation of the study area is predominantly transformed with no viable, natural Eastern Highveld Grassland still present. There is some grassveld in the immediate vicinity of the study area, but this is in poor condition with very little species variation and dominated by common thatching grass (*Hyparrhenia hirta*). The study area is almost exclusively that of thatching grass that has been continually mowed. Thus, creating an unnatural, manmade lawn in the process. A few hygrophyllic grasses and other plant species have established themselves in the wet area of the manmade impoundment.

During site investigations in the study area no Red Data flora species were observed. No Red Data species are registered in the POSA databases for the study area. Further to the above, no Red Data fauna species were encountered in the study area. It is highly unlikely that any Red Data fauna, amphibian or butterfly species are present in the study area or in the immediate vicinity due to the absence of ideal habitat.

There were no sections of vegetation or habitats within the study area found to be in pristine condition. There were also no areas identified as being of high sensitivity (i.e. No-Go areas).

In summary, the study area itself is very small (approximately 200m by 200m) and is degraded and transformed. According to the specialist report the overall impact is seen to be minimal. The initial (short-term) construction phase will naturally have a higher impact on the environment, but this is still very low. Measures to mitigate impact have been proposed. Hence the project will not impact significantly on any conservation activities in the project area.

5.1.4 No-Go

It is suggested that **to maintain the status quo is not the best option for the macro environment**. This proposed project is part of the infrastructure to improve the supply of electricity to Boshmansfontein Colliery. Should this application not be approved then the supply will not be reliable and this can result in major disturbances in the supply of electricity and in the productivity of the mine.

As indicated in this EIA report the impacts that are likely to occur as a result of the proposed power line are insignificant and can be mitigated to acceptable levels. The No-Go development alternative could therefore not be considered the responsible way to manage the site.

5.2 Location Alternatives

The proposed project requires the construction of:

- an approximately 200m long 88kV interconnector Chickadee powerline, between United Substation and the existing Grootpan-United line.

Two Location Alternatives are investigated for the proposed project:

Alternative 1: The route for the line is proposed to connect from the existing 88kV line and run for 200m north-east towards the United Substation. The existing 88kV line is a powerline between Grootpan substation and United substation. The tap off point will be at pole 20 on line no 1, from the Grootpan-United 88kV line. This route is technically the best option as the open feeder bay (inside the substation) is directly in line with this route. In addition, this route is preferred to accommodate planned future expansion of the substation. The existing outgoing routes will have to be used for any future expansion and the proposed alternative 1 route will not interfere with this.

Alternative 2: This route for the line is similar to that of alternative 1, except the tap off point for this alternative (2) is slightly more south east than the tap off point for alternative 1. Should this option be constructed then the most eastern existing line into the substation will need to be removed and replaced with the new proposed power line. This process will cause long outages to the customer. In addition it will result in increased cost and a lengthy construction period.

The **above two alternative localities, Route Alternative 1 and Route Alternative 2**, were investigated and are briefly discussed below:

5.2.1 Ecological status report

The ecological status report identified the following:

- The geology of the Mpumalanga Province is of significant economic importance mainly due to the large coalfield reserves. The study area falls within the Witbank Coal Fields. The soils are light red to yellow-red, sandy soils that are well drained. The clay content is low and the soils are deep. These sandy soils could be prone to water erosion, but erosion in the study area is low, mainly because of the flatness of the topography.
- The land use of the study area is viewed as been urbanisation or infrastructure. Existing powerlines, roads, sportsfields, fences and buildings exist in and around the study area. The remainder of the study area is grass that is regularly mowed and can be viewed as veld that has been transformed.
- The study area and the surrounding region fall within the Grassland Biome. The study area falls within the vegetation type known as Eastern Highveld Grassland. This vegetation type is typical of the region which comprises of open (almost tree-less) grassveld plains stretching from Belfast in the east to the eastern side of Johannesburg in the west and extending southwards to Bethal, Ermelo and west of Piet Retief.
- No mammals, reptiles or amphibians were encountered during field investigations. Only a few bird species were observed. No fauna of flora species of conservation concern were observed during field investigations or are expected to occur due to the lack of ideal habitats. The vegetation of the study area has to all practical purposes been totally transformed and no spots of floristic sensitivity are present.
- A floristic sensitivity calculation of the study area was conducted highlighting two community types. Namely, regional vegetation (open grassland plain) and manmade impoundment (artificial wetland area). The sensitivity level of the regional vegetation was calculated to be low (Go-Zone), while the manmade impoundment is medium / low (Go-Slow). Refer to tables below.
- Due to the surrounding high levels of urbanisation, mining and cultivation degradation of natural habitats, the faunal sensitivity analyses calculated all the habitat types to be low (Go-Zones). The ecological sensitivity analyses, which combines the faunal and floral sensitivity analyses, showed that the sensitivity of the regional vegetation is low (Go-Zone) and the manmade impoundment / wetland to be medium / low (Go-Slow). Refer to tables below.

- The potential impacts of the project on the environment were shown to be low. However, mitigating measures and recommendations were still put forward to further reduce possible impacts. These measures include the following:
 - During the construction phase, no campsite or temporary storage facilities to be erected outside of the study area or confines of the fenced mine property.
 - Positioning of the foundation slabs for the pylons must be a minimum of 32m away from the edge of drainage lines.
 - No pylons to be erected within the impoundment / artificial wetland area.
 - Closest pylon to the edges of the impoundment / artificial wetland area to be placed a minimum of 32m away.
 - Work and construction to be kept within the 31m wide powerline corridor.
 - It is recommended that the manmade impoundment and vegetation be preserved and protected to offset any negative impact the project might have. Part of this protection includes regularly removing any alien species by means of mechanical eradication.
- Line variant recommendations are made on the strength of all the impacts and mitigating actions. As well as on the sensitivities of the various biophysical features and vegetation types. Neither powerline routes impact on or pass through any sensitive areas. There is no difference between the alternative routes with regards to their impact on the natural ecological environment. There are also no other circumstances or potential impacts that differ substantially in any way between the two route alternatives. Therefore, from a *purely ecological viewpoint there is no preferred alternative route*. In other words, *Route 1 or Route 2 can be used* and the final decision should be made on the accumulative weight of other parameters such as feedback from public participation, land tenure issues, construction costs, etc. The line variant recommendation is: **Alternative Route 1** or **Alternative Route 2** can be used.

Habitat sensitivities

Habitat sensitivities were determined for floral and faunal habitats found in the study area. These were found to be as follows:

Floral habitats

The vegetation of the study area has for all practical purposes been totally transformed. No spots of floristic sensitivity (eg. Koppies, ridges, riparian habitat, natural wetlands) were encountered during field investigations. However, a seasonal, artificial impoundment exists. Therefore, a floristic sensitivity calculation of the study area was conducted highlighting two community types. Namely, regional vegetation (open grassland plain) and impoundment (artificial wetland area), as shown in the table below.

Table: Floral sensitivity calculations

CRITERIA	PLANT COMMUNITY TYPE	
	GRASSLAND PLAINS	IMPOUNDMENT / WETLAND
Red Data Species	1	1
Habitat Sensitivity	1	3
Floristic Status	1	2
Floristic Diversity	1	3
Ecological Fragmentation	1	4
Sensitivity Index	10%	26%
Sensitivity Level	LOW	MEDIUM / LOW
Development Go-ahead	GO	GO-SLOW

Criteria are rated on an increasing sensitivity level using a scale of 1-10.

Faunal habitats

No fauna species of conservation concern were observed in the study area. Nor is there any realistic potential for any to be present. This is not only due to the transformed habitat of the study area, but also due to the surrounding high levels of urbanisation, mining and cultivation, which has led to high levels of degradation of natural habitats. There is however, still the possibility that certain species of owls (eg. barn owls (*Tyto alba*) or spotted eagle-owls (*Bubo africanus*)) might hunt in the nearby fields and wet area. A faunal sensitivity calculation of the study area and its two community types are presented in the table below.

Table: Faunal sensitivity calculations

CRITERIA	ANIMAL COMMUNITY TYPE	
	GRASSLAND PLAINS	IMPOUNDMENT / WETLAND
Red Data Species	1	1
Habitat Sensitivity	1	2
Faunal Status	1	1
Faunal Diversity	1	2
Ecological Fragmentation	1	3
Sensitivity Index	10%	18%
Sensitivity Level	LOW	LOW
Development Go-ahead	GO	GO

Criteria are rated on an increasing sensitivity level using a scale of 1-10.

Ecological sensitivities

The ecological sensitivity of the study area is determined by combining the sensitivity analyses of both the floral and faunal components. The component with the highest calculated average is taken to represent the sensitivity of that ecological unit, whether it is floristic or faunal in nature. The ecological sensitivities of the study area are shown in the table below.

Table: Ecological sensitivity calculations for the study area

COMMUNITY	FLORISTIC SENSITIVITY	FAUNAL SENSITIVITY	ECOLOGICAL SENSITIVITY	DEVELOPMENT GO-AHEAD
Grassland plains	Low	Low	LOW	GO
Impoundment / wetland	Medium / low	Low	MEDIUM / LOW	GO-SLOW

There were no sections of vegetation or habitats within the study area found to be in pristine condition. There were also no areas identified as been of high sensitivity (i.e. No-Go areas).

Nature of impacts

No proposed impacts on the ecology of the environment were identified as possibly being beneficial. However, due to the degraded and transformed nature of the study area and surrounding areas, the proposed impacts are seen as being slight to neutral.

Significance of impacts

Grassland Plains

The Eastern Highveld Grassland is a vegetation type that is endangered and efforts need to be made to protect it as best as possible. However, although the study site falls within the Grassland Biome, the vegetation of the site itself has been totally transformed and development on the site will have no positive and no negative impact on the Grassland Biome at all. Furthermore, the nature of the ecological impact of powerlines is relatively low. For these reasons the significance of the impacts are seen as low and can be viewed as neutral.

Impoundment / Wetland vegetation

The dominant vegetation type found in the study area is open, grassland plains. Within these plains of the study area a manmade impoundment is present which has led to the creation of a seasonally waterlogged area or dam.

The manmade impoundment is in the form of a long soil trench and embankment or mound, which is about 1-2m high. This soil mound transects the study site at right angles to the powerline corridors, running from east to west and dams up any storm water runoff from the natural catchment of the area. It would appear that the impoundment was originally built to prevent storm water running into the office buildings and grounds of the colliery, including into the United Substation. Hereby, creating an unnatural, 'wetland' or impoundment, which is seasonal. Although this area can technically be viewed as a small wetland it is in no ways on the same sensitivity or importance level as that of a natural wetland, many of which are found in the province. The impact on the habitat of the impoundment is rated as a low negative impact after the successful implementation of all mitigating and management measures.

Mitigating measures

A number of mitigating measures have been proposed that need to be implemented to reduce impact on the natural environment. These include the following:

Construction phase

- No pylons to be erected within the impoundment / artificial wetland area.
- Closest pylon to the edges of the impoundment / artificial wetland area to be placed a minimum of 32m away.
- It is recommended that the manmade impoundment and vegetation be preserved and protected to offset any negative impact the project might have. Part of this protection includes regularly removing any alien species by means of mechanical eradication.
- Work and construction to be kept within the 31m wide powerline corridor.
- No campsites or other temporary structures to be erected within the work area of the powerline corridors, or in adjacent open areas outside the corridors.
- Campsite, storage facilities and other necessary temporary structures to be erected within the immediate area of United Substation and fenced property of the mine company.
- No open fires to be allowed for cooking or other purposes.
- No material or machinery to be stored or placed in the open veld just outside of the fenced mine company area.
- No concrete to be mixed in the open veld or in the powerline corridors.
- All construction material and equipment to be removed within two (2) weeks after completion of construction.
- Removal of all waste construction material to an approved waste disposal site and only by an approved, registered waste removal company.

Completion phase

- All construction material and equipment to be removed within two (2) weeks after completion of the project.
- All waste construction material must be removed to an approved waste disposal site.
- All disturbed sites and surfaces, such as those created temporary living, storing or ablution facilities and vehicles to be rehabilitated.
- No mounds of sand or other materials to be left behind.

Maintenance phase

- Mechanical control of alien plants around disturbed areas to be implemented within two months of completion of construction. Thereafter every six months. These areas are predominantly around the erected pylons where actual soils will be disturbed during construction. Although the area is heavily infested with alien weeds and natural veld all but non-existent, it is still important to prevent weed growth in case a new, more aggressive species has been introduced during the construction phase of the project.
- No chemical control of alien plants to be used. These chemicals (herbicides) will have a detrimental effect on the surrounding vegetation and habitats. Furthermore and of critical importance, the servitudes run next to and through cultivated lands and herbicides (weed killers) will have a negative impact on these crops. Even if only slight this could cause unwanted and unnecessary negative publicity for Eskom.
- Vegetation within the powerline corridors to be mowed as a maintenance procedure and not ploughed. Ploughing disturbs the soils creating ideal conditions for alien plant species to invade the area, as well as increasing the possibility of soil erosion by water runoff.

- Area around foundation slabs to be check before and after the summer rains for signs of soil erosion due to water run-off. Such sites need to be modified and rehabilitated to prevent ongoing erosion.
- Two of the impacts of greatest concern on the environment are the introduction of alien plants and soil erosion. As already mentioned these impacts need to be monitored and managed on an ongoing basis.

Line variant recommendations

Line variant recommendations are made on the strength and combination of all the impacts and mitigating actions. As well as on the sensitivities of the various biophysical features, faunal habitats and vegetation types. A comparison between the two alternative routes, as to the number of ecologically sensitive units each one potentially impacts on, is shown in the table below:

Ecological Sensitive Units	Alternative Route 1	Alternative Route 2
Areas of High ecological sensitivity	0	0
No-Go areas	0	0
Rivers & streams crossed	0	0
Rocky outcrops in corridor	0	0
Wetlands encountered	0	0
Impoundments encountered	1	1
Total impacts per route	1	1

Neither powerline routes impact on or pass through any sensitive areas. There is no difference between the alternative routes with regards to their impact on the ecological environment. There are also no other circumstances or potential impacts that differ substantially in any way between the two route alternatives. Therefore, from a purely ecological viewpoint there is no preferred alternative route. In other words, Route 1 or Route 2 can be used and the final decision should be made on the accumulative weight of other parameters such as feedback from public participation, land tenure issues, construction costs, etc.

Taking all of the above issues into account, the **Ecological recommended line variant** for the proposed project is: The line variant recommendation is: **Alternative Route 1 or Alternative Route 2** can be used.

5.2.2 Bird Impact Assessment

The Bird Impact Assessment indicated the following:

Electrocution

Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components. The steel monopole is not a major electrocution hazard to birds, except in specific instances, and then only for vultures, which do not occur in the study area. No electrocution risk is therefor foreseen for the new 88kV lines.

Collisions

The most direct impact that the proposed line could potentially have on Red Data birds is collisions with the overhead earth wire. However, the following factors reduce the risk of collisions:

- Both alternatives for the proposed power line will be situated next to a busy road and industrial area, which is an existing impact and zone of disturbance for birds. No collision risk is therefore foreseen for large, collision-sensitive Red Data species as these species do not occur at the study site.
- The presence of existing power lines at the study site may also be a factor that reduces the risk of collisions with a new line, provided the new line is placed directly parallel to the existing line, which is the case with both proposed alternatives. It is a proven fact that placing a new line next to an existing line reduces the risk of collisions to birds. The reasons for that are two-fold namely it creates a more visible obstacle to birds and the resident birds, particularly breeding adults, are used to an obstacle in that geographic location and have learnt

to avoid it. In this instance, this may be particularly relevant for African Grass-Owls that may be resident in the artificial impoundment area at the study site.

For the reasons stated above, the overall risk of Red Data species collisions is regarded as low.

Habitat destruction

A limited degree of habitat destruction always takes place when a power line is constructed. In this instance the study area has been intensively transformed through industrial activity, which includes the regular mowing of the remaining grassland. This has destroyed the structure of the original grassland. The additional impact would therefore be minimal, given the already degraded state of the vegetation. The small footprint of the proposed steel mono-pole should limit the potential impact on the wetland vegetation in the artificial wetland area, but ideally no structures should be constructed in the wetland area. It should be noted that there are already existing power line structures in the wetland area.

Disturbance

There is a possibility of disturbing roosting and/or breeding African Grass-Owls in the artificial wetland area during the construction period, although their presence could not be confirmed during the site visit. The impact of the disturbance will be tempered by the following factor:

- Disturbance is a temporary impact, which will cease after the construction of the line. Should there be any disturbance of African Grass-Owls during construction; the birds are likely to return after construction.

Mitigation

The following recommendations are put forward to mitigate the potential impact on African Grass-Owls:

- If at all possible, no poles should be constructed in the artificial wetland area to minimize potential disturbance to African Grass-Owls.

Preferred alignment

Both alternative alignments are essentially situated in similar bird habitat, therefore the impacts are likely to be similar and scope and nature. From a bird impact perspective, no specific preference can be indicated. Both alignments are suitable options.

From a bird impact assessment perspective, the proposed development should have a low impact. The extensive habitat transformation (industrial activity) that is already evident in the area has made the study area unattractive for the power line sensitive Red Data species except possibly African Grass-Owl, which could potentially be impacted in the artificial wetland area through disturbance during construction.

5.3 CONCLUSION

- Alternatives have been considered for this project, and in specific locality alternatives, that is Route Alternative 1 and Route Alternative 2.
- From a purely **ecological viewpoint**, due to the physical nature of the power lines, the overall impact is seen to be minimal over the medium- to long-term. The initial (short-term) construction phase will naturally have a higher impact on the environment, but this is still very low. Neither powerline routes impact on or pass through any sensitive areas. There is no difference between the alternative routes with regards to their impact on the natural ecological environment. There are also no other circumstances or potential impacts that differ substantially in any way between the two route alternatives. Therefore, from a **purely ecological viewpoint** there is no preferred alternative route. In other words, **Route 1 or Route 2 can be used**.
- From a **bird impact assessment** perspective, the proposed development should have a low impact. The extensive habitat transformation (industrial activity) that is already evident in the area has made the study area unattractive for the power line sensitive Red Data species except possibly African Grass-Owl, which could potentially be impacted in the artificial wetland area through disturbance during construction. Both alternative alignments are essentially situated in similar bird habitat, therefore the impacts are likely to be similar and scope and nature. From a bird impact perspective, no specific preference can be indicated. **Both alignments are suitable options**.

- In **summary**, however, due to close similarities of alternatives 1 and 2 it is imperative that the accumulative weight of other parameters such as feedback from public participation, land tenure issues, construction costs, technical constraints, etc. also be taken into account when deciding on the final alternative between Alternative 1 and Alternative 2.
- **Subsequently, Alternative 1 is preferred and submitted as the final proposed route mainly due to the following:**
 - This route is technically the best option as the open feeder bay (inside the substation) is directly in line with this route. In addition, this route is preferred to accommodate planned future expansion of the substation. The existing outgoing routes will have to be used for any future expansion and the proposed alternative 1 route will not interfere with this.
 - Should Alternative 2 be constructed then the most eastern existing line into the substation will need to be removed and replaced with the new proposed power line. This process will cause long outages to the customer. In addition it will result in increased cost and a lengthy construction period.

The **final proposed route is Alternative 1** on the farms Tweefontein 13 IS RE and Boschmansfontein 12 IS RE in the Emalahleni Local Municipality in the Mpumalanga Province.

6. Impact assessment

The expected **negative impacts** of the proposed project on the environment were identified as follows (evaluated in the BA Report):

1. Impact on natural habitat
2. Social impact
3. Impact on birds
4. Visual impact
5. Risk of surface and ground water pollution
6. Risk of erosion
7. Influx of labourers to the area
8. Access to properties
9. Impacts associated with firebreaks and servitude maintenance
10. Impact of solid waste
11. Impact of alien vegetation

For this project the investigations into these issues confirmed in summary the following:

1. Impact on natural habitat

This impact is associated with the potential for disruption of sensitive floral habitats and fauna populations. The planning regarding the route of the power line should take into account the ecological sensitivity of the site.

Relevant to the project is the following:

The study area is very small and is situated inside of the fenced-off property of Boschmansfontein Colliery. The study area for the proposed powerline servitudes runs approximately north-south over a very short distance of 200m. No proposed impacts on the ecology of the environment were identified as possibly being beneficial. However, due to the degraded and transformed nature of the study area and surrounding areas, the proposed impacts are seen as being slight to neutral.

Grassland Plains

The Eastern Highveld Grassland is a vegetation type that is endangered. However, although the study site falls within the Grassland Biome, the vegetation of the site itself has been totally transformed and development on the site will have no positive and no negative impact on the Grassland Biome at all. Furthermore, the nature of the ecological impact of powerlines is relatively low. For these reasons the significance of the impacts are seen as low and can be viewed as neutral.

Impoundment / Wetland vegetation

Within the study area a manmade impoundment is present which has led to the creation of a seasonally

waterlogged area or dam. The manmade impoundment is in the form of a long soil trench and embankment or mound, which is about 1-2m high. This soil mound transects the study site at right angles to the powerline corridors, running from east to west and dams up any storm water runoff from the natural catchment of the area. It would appear that the impoundment was originally built to prevent storm water running into the office buildings and grounds of the colliery, including into the United Substation. Hereby, creating an unnatural, 'wetland' or impoundment, which is seasonal. Although this area can technically be viewed as a small wetland it is in no ways of the same sensitivity or importance level as that of a natural wetland, many of which are found in the province. The impact on the habitat of the impoundment is rated as a low negative impact after the successful implementation of all mitigating and management measures.

Mitigation of impact on natural habitat

Proper planning will limit the impact of the power line on the natural habitat and therefore the following is proposed:

- Site-specific measures in terms of ecology as identified by the ecologist, Mr. Johannes Maree of Flori Horticultural Services (Tel 082 564 1211) must be included in the contract with the Contractor and implemented by the Contractor during the construction phase. These measures are included in the EMP of the BAR.
- Various species of indigenous trees and bush are protected by law in terms of the National Forests Act No 84 of 1998, which stipulates that it is necessary to obtain a permit from the relevant provincial office of the Department of Agriculture, Forestry and Fisheries in order to cut them. No permit applications are envisaged for this project.
- During the construction phase, no campsite or temporary storage facilities to be erected outside of the study area or confines of the fenced mine property.
- Only portable, chemical ablution facilities to be used and these to be positioned only within the study area or confines of the fenced mine property.
- Portable ablution facilities only to be serviced by registered companies and on a regular basis. No effluent or sewage to be dumped in the veld or neighbouring lands.
- Positioning of the foundation slabs for the pylons must be a minimum of 32m away from the edge of drainage lines.
- No trees outside of the powerline corridor to be removed.
- Disturbed surface areas in the construction phase to be restored. No open trenches to be left. No mounds of soils created during construction to be left.
- An ongoing programme should be implemented to mechanically control alien plant species that invade the disturbed soils around the newly erected pylons. This should be done in such a way as to allow the natural grasses to colonise the disturbed area, thereby keeping the aliens at bay.
- Mechanical control of alien species to be implemented within two months of completion of construction of the powerline. Thereafter ever six months.
- Surface area under powerlines to be mowed and not ploughed.
- No chemical control to be used in the control of alien plants or indigenous plants.
- All construction material and equipment to be removed within two (2) weeks after completion of construction.
- Removal of all waste construction material to an approved waste disposal site and only by an approved, registered waste removal company.
- It was concluded that, from a vegetation and fauna perspective, if duly mitigated and planned, the overall impact is seen to be minimal over the medium- to long-term.

2. Social Impact

- The construction of new power lines could potentially impact on landowners, land users or lands rights holders if not planned and designed to accommodate the needs of the landowners.

Mitigation of Social Impact

The routes of power lines should be designed to accommodate the needs of landowners and landusers.

- The design for the power line route and the placement of structures should be accommodating to existing structures in the alignment of the route.
- Routes with evident visual disturbance caused by existing power lines or roads are in general more acceptable than traversing through pristine area.

- Both alternatives for the project will have insignificant impact on the receiving environment and any affected landowners.
- The power line is less than 200m long and inside of the fenced-off property of Boschmansfontein Colliery.
- In general, a building restriction of 31 meters is applicable to Eskom 88kV/132kV power lines, which implies 15,5 meters on either side of the centre line underneath the power line.
- A servitude area is a no building area, except for Eskom structures. Usually, normal farming activities may continue in a servitude with the exception that no trees may be planted or structures may be erected.
- During the course of the EIA, all affected landowners were identified and consulted with regarding the proposed project. Refer to the register of landowners in Appendix E7 of the BAR.
- Generally the property in question (servitude) will not be purchased and the registered owner will receive compensation for the use of the servitude. Further negotiations will take place to confirm the details for the acquisition of the servitude and compensation therefore.
- The negotiations with the landowner to this regard will be conducted once the final route has been recommended. The landowner supports the alternatives.
- The negotiator will confirm the specific requests/requirements with the landowner. These will be stipulated in the final document, an option document. The option document is a binding document that reflects all the requirements of the landowner, for example: the exact positions of the pylons on his property; the negotiated compensation for the servitude; specific access arrangements to his property etc.

3. Impact on Birds

The possible impacts of the proposed construction of power lines on birds are the following:

Habitat destruction

A limited degree of habitat destruction always takes place when a power line is constructed. In this instance the study area has been intensively transformed through industrial activity, which includes the regular mowing of the remaining grassland. This has destroyed the structure of the original grassland. The additional impact would therefore be minimal, given the already degraded state of the vegetation.

Recommendation: The small footprint of the proposed steel monopole should limit the potential impact on the wetland vegetation in the artificial 'wetland' area, but ideally no structures should be constructed in the 'wetland' area. It should be noted that there are already existing power line structures in the 'wetland' area.

Disturbance

There is a possibility of disturbing roosting and/or breeding African Grass-Owls in the artificial 'wetland' area during the construction period, although their presence could not be confirmed during the site visit. The impact of the disturbance will be tempered by the following factor:

- Disturbance is a temporary impact, which will cease after the construction of the line. Should there be any disturbance of African Grass-Owls during construction; the birds are likely to return after construction.

Recommendation: If at all possible, no poles should be constructed in the artificial 'wetland' area to minimize potential disturbance to African Grass-Owls.

Further impacts of powerlines on birds are the following:

Electrocutions: Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components.

Recommendation: The steel monopole is not a major electrocution hazard to birds, except in specific instances, and then only for vultures, which do not occur in the study area. No electrocution risk is therefore foreseen for the new 88kV lines.

Collisions: Collisions are when birds collide with the conductors or earth wires of overhead power lines.

The most direct impact that the proposed line could potentially have on Red Data birds is collisions with the overhead earth wire. However, the following factors reduce the risk of collisions:

- Both alternatives for the proposed power line will be situated next to a busy road and industrial area, which is an existing impact and zone of disturbance for birds. No collision risk is therefore foreseen for large, collision-sensitive Red Data species as these species do not occur at the study site.
- The presence of existing power lines at the study site may also be a factor that reduces the risk of collisions with a new line, provided the new line is placed directly parallel to the existing line, which is the case with both

proposed alternatives. It is a proven fact that placing a new line next to an existing line reduces the risk of collisions to birds. The reasons for that are two-fold namely it creates a more visible obstacle to birds and the resident birds, particularly breeding adults, are used to an obstacle in that geographic location and have learnt to avoid it. In this instance, this may be particularly relevant for African Grass-Owls that may be resident in the artificial impoundment area at the study site.

For the reasons stated above, the overall risk of Red Data species collisions is regarded as low.

4. Loss of cultivation potential

The power line and their routes can have an impact on a number of other activities, such as cultivation potential. The construction of power lines with the resulting clearance of servitudes can lead to a temporary loss in agricultural land.

Mitigation of impact on agriculture

The proposed construction of the power line will however have **no impact on any agricultural activity**. The following is relevant to this project:

- The land use of the study area is viewed as been urbanisation or infrastructure. Existing powerlines, roads, sportsfields, fences and buildings exist in and around the study area. The remainder of the study area is grass that is regularly mowed and can be viewed as veld that has been transformed.
- It is therefore submitted that the servitude area will not interfere with any agricultural activities on the properties. In addition, Eskom will not own the servitude but will purchase the rights to construct and maintain the line. A change in land use from agriculture to another land use is not applicable.

5. Visual impact

Impact on the esthetics of an area is related primarily to the visual impact of the proposed power line and secondary to the impact of habitat destruction.

Factors to consider regarding the visual impact are the following:

- The ability of the surrounding environment to absorb the visual impact of the power line.
- The structures to be used for the power line.
- The clearance of vegetation during construction.

Mitigation of Visual Impact

The following is relevant to this project:

- Impact to the natural habitat as a result of the project is to be expected. Construction could cause a significant impact to the habitat where insensitive clearing for construction and access purposes, etc. is required.
- However, due to the degraded and transformed nature of the study area and surrounding areas, the proposed impacts are seen as being insignificant.
- The study site is within the premises of the Boschmansfontein Colliery. Existing powerlines, a substation, roads, sportsfields, fences and buildings exist in and around the study area. The remainder of the study area is grass that is regularly mowed and can be viewed as veld that has been transformed.
- The visual experience of the area can hence be described as low due to existing disturbances.
- Despite the transformed character of the area, some recommendations are made to limit visual impact.
- It is suggested that any existing roads must be used during construction and maintenance of the power line.
- The procedures for vegetation clearance and maintenance within overhead power line servitudes and on Eskom owned land, updated September 2009 must be implemented. These procedures include i.e. the following:
 - Clearing for pylon positions must be the minimum required for the specific tower, not more than a 5m radius around the structure position.
 - Indigenous vegetation, which does not interfere with the safe operation of the power line, should be left undisturbed.
 - In addition, visual impact could generally be mitigated to some extent by constructing the lines with monopole steel structures. The monopole is planted 2 meters deep in a concrete slab with a 2 meters wide radius. From previous experience the steel poles are known to weather and with time blend into the environment.

6. Risk of surface and ground water pollution

- Construction materials and construction equipment will be stored at the campsite and used on site. The pollution of groundwater may result from any spillages that may occur. In addition, the campsite may accommodate construction workers, in which case solid and liquid effluents will be produced, including sewage and domestic solid waste.
- Therefore possible diesel, oil and lubricant spills are the main concern in respect of water pollution during construction together with organic pollution caused by inadequately managed facilities at site camps and at the work sites. The above may result in a change in groundwater quality with the associated negative impact on humans and the natural habitat.
- A management plan must be in place to rehabilitate any such spills. Part of the management strategy must further include the proper storage and removal of any by-products and building rubble.
- It is strongly recommended that no construction of any sort takes place within aquatic habitats encountered, as these habitats are viewed as sensitive.

Mitigation of Surface and Groundwater Pollution

Construction camp

- Campsite, storage facilities and other necessary temporary structures to be erected within the immediate area of United Substation and fenced property of the mine company.
- Encourage the construction contractor to employ local people as far as is reasonably practical and encourage the contractor to transport them daily to and from site. This will reduce solid and liquid waste production and water demand at the site camps.
- According to the applicant and their contractors, accommodation for the construction workers is mostly rented in the nearest town. Sewage disposal will therefore be through the Municipality's main sewer line. Should accommodation in a construction camp be unavoidable, then the measures as stipulated in the EMPr must be adhered to.
- Included as requirement in the EMPr under heading "*Waste Management*" is the following: The disposal of chemical toilets should be at a registered or licensed sewage disposal facility. Proof of agreement between the applicant and the sewage disposal facility for such disposal, confirming that there will be enough capacity to accommodate additional waste, should be submitted to the Department of Water Affairs.
- No water for drinking or cooking purposes should be used from out of any streams, vleis or farm dams in the vicinity. It is important for relevant management or contractors to ensure that staff/workers are supplied regularly with adequate clean drinking and cooking water.
- The water used to supply the site with potable water is sourced/purchased from farmers in the area (or from the Boschmansfontein Mine) with pre-existing rights. The contractor should deliver the water to the site in the applicable water tankers. These requirements are included in the EMPr under the headings "*Construction site*" and "*Ground and Surface Water*".
- In all cases, abstraction of water for construction purposes will require a permit from the Department of Water Affairs unless pre-existing rights are purchased from farmers.
- Mixing of cement, concrete, paints, solvents, sealants and adhesive must be done in specified areas on concrete aprons or on protected plastic linings to contain spillage or overflows onto soil to avoid contamination of underground water. No concrete to be mixed in the open veld or in the powerline corridor.
- Work and construction to be kept within the 31m wide powerline corridor.
- No open fires to be allowed for cooking or other purposes.
- No material or machinery to be stored or placed in the open veld just outside of the fenced mine company area.
- All construction material and equipment to be removed within two (2) weeks after completion of construction.
- Proper and adequate containers (rubbish bins) to be placed in campsites for the temporary disposal of food waste and general litter generated by construction workers. These containers need to close securely to avoid items (eg. Paper and plastic) being blown into the veld, etc. Proper waste management is essential.

Diesel, hydraulic fluid and lubricants

- Minimize on-site storage of petroleum products. Relevant to this project, is that the relevant dangerous goods to be stored on site is diesel. The diesel tank can hold 2000 litres (2 cubic metres). Of relevance is: GNR 544 of 2010, activity nr 13 that states "...storages of dangerous goods with a capacity above 80 cubic metres....". The

amount of diesel that will be stored on site is 2 cubic metres and is therefore a relatively small amount and well below the threshold of the listed activity of 80 cubic metres.

- Precautionary methods to be implemented for handling of oil and substances that could impact on the soils, ground- and surface water:
- No hazardous substances may be stored on site for a period exceeding 90 days. (Note that the Department of Water Affairs requires a permit for a waste disposal site in the event that longer storage periods apply).
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labeled. The storage of any hazardous substances must take place in a secured lock-up building or covered area.
- Build adequate structures (berms and containment structures) to contain any oil spills, which might emanate from transformers.
- Bund storage tanks to 120% of capacity.
- Ensure proper maintenance procedures in place for vehicles and equipment.
- Servicing of vehicles to be in designated areas with appropriate spill management procedures in place.
- Ensure measures to contain spills readily available on site (spill kits).
- A container filled with sand to soak up any spillages, as well as an empty container into which the "contaminated" sand could be placed and stored for collection by the supplier of the chemicals or oils must be provided.
- The Regional Representative of the Department of Water Affairs should immediately be informed if pollution of any groundwater or soils occurs. They will give instruction on actions to be taken in this regard.

Site camp domestic waste (kitchens, showers)

- Deposit solid waste in containers and dispose of regularly- at least weekly. Any waste that cannot be recycled will be transported to the appropriate landfill site licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act No 59 of 2008). Proof to be kept by contractor.
- Under no circumstances may any waste food or general litter be dumped, or buried in the veld.
- Dispose of liquid waste (grey water) with sewerage.

Site camp sewage

- Minimize on-site accommodation.
- Supply, maintain and enforce the use of mobile toilets at the work sites. Only proper portable, chemical ablution facilities to be used and these to be positioned only within the fenced property of the mine area.
- Included as requirement in the EMPr under heading "*Waste Management*" is the following: The disposal of chemical toilets should be on a regular basis and at a registered or licensed sewage disposal facility. Proof of agreement between the applicant and the sewage disposal facility for such disposal, confirming that there will be enough capacity to accommodate additional waste, should be submitted to the Department of Water Affairs.
- Under no circumstances may any effluent or sewage to be dumped (or buried) in the open veld.

Site camp inert waste (waste concrete, reinforcing rods, waste bags, wire, timber etc)

- Ensure compliance with stringent clean up requirements on site. As a general requirement, disposal should be at least twice a week.
- The solid waste will be transported off site by the contractor and returned to Eskom Stores where the scrap will be handed over to buyers (scrap dealers). Mostly the waste is steel that is recycled and taken to the Eskom stores. Other waste is normally the used cement bags and this is disposed of in the construction hole for the pylon. The bags will be mixed into the cement and used to fill the excavated hole of the pylon. Any other waste that cannot be recycled (this is minimal) will be transported to an appropriate landfill site licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act No 59 of 2008). The disposal of any construction waste will be the responsibility of the developer and should be done at least twice a week. A letter of agreement between the developer and the Permit Holder of the waste disposal site shall be provided to the DWA.
- These measures are also included as requirements in the EMPr under the headings "*Appointment of Contractors*" and "*Waste Management*". Also refer to the other mitigation measures under the same headings.

Wetlands

- There is no seasonal, or non-seasonal, surface water in the form of rivers, streams, or natural wetlands within this area. There is a manmade soil barrier (embankment) that runs east-west, which causes storm water runoff

from the catchment area to dam up during the rainy summer season. Hereby, creating an unnatural, 'wetland' or impoundment, which is seasonal. Although the impact to the 'wetland' is rated as a low negative impact, under no circumstance may any activities directly or indirectly related to the power line project take place within this 'wetland' area.

- No pylons to be erected within the impoundment / artificial wetland area.
- Closest pylon to the edges of the impoundment / artificial wetland area to be placed a minimum of 32m away.
- It is recommended that the manmade impoundment and vegetation be preserved and protected to offset any negative impact the project might have. Part of this protection includes regularly removing any alien species by means of mechanical eradication.

Water Use License Applications

- The law (National Water Act (NWA)) specifies certain activities that qualify as a 'Water Use' that will either need to be registered (General authorisation) or a water use license applied for (Water Use License Application (WULA)).
- However, indication is given in this report that according to the ecologist specialist who is also a wetland specialist, the applicant will **not need to apply for a water use license or register as a water user** in terms of the General Authorisations.

7. Risk of erosion

- The power line and their routes can have an impact on a number of other activities, such as erosion.
- Unnecessary clearing of vegetation can result in exposed soil prone to erosive conditions.
- Insufficient soil coverage after placing of topsoil, where large surface areas are applicable, could also cause erosion.
- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969.)
- The management of surface water runoff during construction is important to prevent soil erosion on the site. If construction takes place during the rainy season, sufficient storm water management will be required to manage water runoff.
- In summary, excavation of foundations for pylons, movement of vehicles and people and the run-off from cleared areas can cause erosion.

Mitigation of Impact on erosion

- The study area falls within the Witbank Coal Fields. The soils are light red to yellow-red, sandy soils that are well drained. The clay content is low and the soils are deep. These sandy soils could be prone to water erosion, but erosion in the study area is low, mainly because of the flatness of the topography.
- Construction activities should be well managed to prevent erosion and the following is relevant:
- It is strongly recommended that no construction of any sort take place within aquatic habitats encountered, as these habitats are viewed as sensitive.
- Construction must be limited to drier periods.
- Unnecessary clearing of flora resulting in exposed soil prone to erosive conditions should be avoided.
- Vegetation under pylons and next to pylons to be mowed and not ploughed.
- No trees or existing grass strata outside of the power line corridor should be removed to lower any kinetic energy of potential run-off.
- The eradication of any alien vegetation should be followed up as soon as possible by replacement with indigenous vegetation to ensure quick and sufficient coverage of exposed soil.
- Pro-active measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil erosion.
- Disturbed surface areas in the construction phase to be rehabilitated. No open trenches to be left. No mounds of soils created during construction to be left.
- Specifications for topsoil storage and replacement to ensure sufficient soil coverage as soon as possible after construction activities as identified in the Environmental Management Programme must be implemented.
- All cleared areas must be ripped and rehabilitated after construction. The top 200mm layer of topsoil must be removed and stockpiled in heaps not higher than 2m and replaced on the construction areas once the activities have been completed. The affected areas should be replanted with a grass mixture indigenous to the area.

8. Impact of labourers

An uncontrolled influx of labourers with associated squatter and increased crime problems create pressure on the natural environment (placement of snares, removal of trees for firewood, careless waste disposal, etc.). This could be severe resulting in permanent damage to the environment if not mitigated properly.

Mitigation of impact of labourers

- Mitigation measures to counter impact on the natural environment and limit potential for crime include specifications in terms of control of construction workers (i.e. provision of toilet and cooking facilities, provision of either accommodation facilities or transport facilities, implementation of Environmental Educational Programmes, etc.). Accommodation for labourers must either be limited to guarding personnel on the construction site (with labourers transported to and from existing neighbouring towns) or a separate fenced and controlled area where proper accommodation and relevant facilities are provided.
- Prepare a comprehensive Environmental Management Programme (EMPr) for the control of environmental impacts at the site camps.
- The EMPr is to include specific provision for the management of the following:
 - Site location
 - Solid waste
 - Liquid effluent (sewage)
 - Storm water
 - Litter
 - Nuisance (Noise)
 - Hazardous substances
 - Social pathologies (prostitution, drunkenness, theft)
 - HIV/Aids prevention.
 - Develop an HIV/Aids workplace policy.
 - Ensure that the contractors develop a comprehensive site camp management plan. This should apply even in the case of the limited accommodation camps recommended above.
 - Plan campsites an appropriate distance from any facility where it can cause a nuisance.

9. Access to properties

Eskom Holdings has a right to enter properties in order to maintain plant and obtain meter readings, therefore the manner of access to land, on which Eskom holds servitudes and electrical infrastructure, should be adhered to by Eskom as well as Landowners.

Security is important to Landowners who need to ensure that the safety of their family, staff and property is catered for. Coupled to this is the escalating crime rate.

Mitigation to establish a protocol for Access

Protocol measures to facilitate access are i.e. as follows:

- All Eskom staff will carry identity cards containing their photographs, indicating that they are Eskom employees. Landowners may verify presence of Eskom staff telephonically at the Contact Centre, at 08600 37566.
- Eskom contractors will carry identity cards displaying their photographs, indicating that they are contractors. Letters containing contract appointment as well as whom at Eskom to contact will be given to each Contractor. In the case of unplanned activities, the contractor must be in possession of a work order number.
- Eskom vehicles will be clearly marked on the door. Vehicles operating after dark will be fitted with amber rotating lights.

10. Impacts associated with firebreaks and servitude maintenance

The servitude areas have to be maintained to ensure the safety of the Eskom hardware, as well as the landowner and his property. Should the servitude not be maintained this could result in danger to the powerline as well as damage to the property of the landowner.

Mitigation of the impact associated with firebreaks and servitude maintenance

- In the case of 33kV, 88kV and 132kV distribution power lines, Eskom obtains the rights to a servitude.

- A servitude is a real right which Eskom obtained in order to construct its infrastructure upon the affected property and it is registered in the Deeds Office against the title deed of the affected property. The effected owner normally gets compensated for this right according to market related values. The servitude stays effective even if a property is transferred to another owner.
- The National Veld and Forest Fire Act (Act 101 of 1998) places an obligation on the owner to ensure compliance and hence creation of fire-breaks amongst other. The Act defines owner as follows: “owner” has its common law meaning and includes— (a) a lessee or other person who controls the land in question in terms of a contract, testamentary document, law or order of a High Court;
- The Eskom understanding is that Eskom needs to ensure compliance to the Act where it has purchased a property (hence being the owner), such as a substation, where Eskom controls the access to the site. Eskom is not considered as the owner for rights obtained via a wayleave agreement or servitude. Hence, the requirements for creating firebreaks or joining Fire Protection Agencies are applicable as far as where Eskom has a substation, or other similar areas, and not for power lines. These opinions were reflected in the specifications – thus, the Vegetation Management Standard does not specify requirements for fire breaks.
- Fire Risk Management is dealt with under a procedure titled “Distribution Fire Risk Management”, reference SCSASAAJ6. Grass fires are dealt with in this procedure stating that vegetation and equipment must be maintained. A specific procedure deals with fire risk management for substations where the chipped stone needs to be maintained to prevent vegetation growth.
- Eskom Distribution does not make use of the practice to burn firebreaks, since this is not a legal requirement. Rather, it relies on the maintenance of vegetation in accordance to its Vegetation Management Standard to reduce the risk of fires starting from Eskom infrastructure.
- Eskom Distribution Division does not remove the grass below power lines as this does not pose a safety risk and will create the potential for erosion, causing environmental degradation and hence legal liability. It will furthermore be an economically unsustainable exercise for Eskom given the amount of power lines throughout South Africa.

11. Impact of Solid Waste

- It is expected that a small amount of construction waste will be generated during construction.
- Expected waste could be unused steel, conductor cables, cement or concrete and general waste around the construction site (plastic, tins and paper), which may degrade the environment if not disposed in the correct manner.
- Solid waste might remain on site after the completion of construction. This can cause pollution to the environment and be detrimental to animals.

Mitigation of Impact of Solid waste

- The construction teams should ensure that all waste is removed from the site and that they recycle the items that can be used again. Unusable waste steel and aluminum will be sold to scrap dealers for recycling at the Eskom stores.
- The solid waste will be transported off site by the contractor and returned to Eskom Stores where the scrap will be handed over to buyers (scrap dealers). Mostly the waste is steel that is recycled and taken to the Eskom stores. Other waste is normally the used cement bags and this is disposed of in the construction hole for the pylon. The bags will be mixed into the cement and used to fill the excavated hole of the pylon.
- Any other waste that cannot be recycled (this is minimal) will be transported to an appropriate landfill site licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act No 59 of 2008).
- The disposal of any construction waste will be the responsibility of the developer and should be done at least weekly. A letter of agreement between the developer and the Permit Holder of the waste disposal site shall be provided to the DWA and a copy kept on site.
- These measures are also included as requirements in the EMPr under the headings “*Appointment of Contractors*” and “*Waste Mangement*“. Also refer to the other mitigation measures under the same headings.
- Stockpiling of construction material should be such that pollution of water resources is prevented and that the materials will be retained in a storm event.

- Once construction is completed, the contractor has to obtain written consent from the relevant landowner that the construction site, construction areas, access routes, etc. are sufficiently and adequately rehabilitated to the landowner's satisfaction.

12. Impact of alien vegetation

- One of the impacts of concern is the introduction of alien plants to the project area.
- The manner in which the right of way was obtained/registered is an important factor in determining the legal requirements for erosion and weed control.
- The Conservation of Agricultural Resources Act (Act 43 of 1983) places a duty on the land user to control erosion and declared weeds and invader plants. Hence, the standard specifies weed control as a requirement for all power lines.
- A servitude is a real right which Eskom obtained in order to construct its infrastructure upon the affected property and it is registered in the Deeds Office against the title deed of the affected property. This places a duty on Eskom to control declared weeds and invader plants.

Mitigation of alien vegetation

- The excessive and incorrect use of herbicides has caused a worldwide problem of the build-up of toxins in ecosystems. It is strongly felt that due to the grassland nature of the study areas there is no need for the use of herbicides.
- Mechanical control of alien plants around disturbed areas to be implemented within two (2) months of completion of construction of the power line. Thereafter every six months.
- These areas are predominantly around the erected pylons where actual soils will be disturbed during construction. Although the area is heavily infested with alien weeds and natural veld all but non-existent, it is still important to prevent weed growth in case a new, more aggressive species has been introduced during the construction phase of the project.
- No chemical control of alien plants to be used. These chemicals (herbicides) will have a detrimental effect on the surrounding vegetation and habitats. Furthermore and of critical importance, the servitudes run next to and through cultivated lands and herbicides (weed killers) will have a negative impact on these crops. Even if only slight this could cause unwanted and unnecessary negative publicity for Eskom.
- Vegetation within the powerline corridors to be mowed as a maintenance procedure and not ploughed. Ploughing disturbs the soils creating ideal conditions for alien plant species to invade the area, as well as increasing the possibility of soil erosion by water runoff.

The positive impacts of the proposed power line project on the environment are as follows:

- Long-term, regional benefits of reliable power supply and the resultant socio-economic benefits.
 - Included in this is the fact that any infrastructure development as a secondary impact will ultimately positively influence the development of the SMME- sector through electricity provision.
 - On the opposite pole the lack thereof will most certainly be to the detriment of SMMEs, especially in rural developing areas, where the lack of, as well as inconsistent, infrastructure could seriously lead to the detriment of economic development directly impacting on social well-being.
- Potential reduction in crime as a result of short-term job creation during construction (providing farm safety and security measures are implemented)
- Possible local growth in the economy of the surroundings towns and others in the sub-region, and for local businesses depending on where the construction camp is.
- Economic benefits for contractors and other suppliers of goods and services.
- The project as proposed will ensure significant capital investment that will contribute to the economical growth of the area.
- Private business opportunities could be stimulated.
- This proposed project is part of the infrastructure to improve the supply of electricity to the broader area. Should this application not be approved then the supply will not be reliable and this can result in major

- disturbances in the supply of electricity.
- As indicated in this EIA report the impacts that are likely to occur as a result of the proposed power line are minimal over the medium- to long-term and can be mitigated to acceptable levels. The No-Go development alternative could therefore not be considered the responsible way to manage the site.

An **Environmental Management Plan (EMP)** was compiled to ensure that

- mitigation measures are identified and implemented to avoid or minimise the expected negative environmental impact and enhance the potential positive impact associated with the project;
- the developer, construction workers and the operational and maintenance staff are well acquainted with their responsibilities in terms of the environment;
- communication channels to report on environment related issues are in place.

7. Conclusion and recommendations

- A draft Basic Assessment Report was compiled with the main aim to identify issues, potential impacts and potential alternatives associated with this project. It includes a description of the status quo of all relevant environmental components as well as the proceedings of the PPP and communication with registered Interested & Affected Parties (IAPs). Notification of the availability thereof was sent to all IAPs on 23 August 2012 with comment requested by 3 October 2012.
- Subsequently, a final Basic Assessment Report (BAR) will be compiled and forwarded to DEA by November 2012. This report will include all concerns raised to the draft BAR and responses thereto. The Consultants (EAP) will ensure that all concerns raised are addressed in appropriate detail in the final Basic Assessment Report.

It is concluded that the construction of the proposed United 88kV line will have an overall positive impact on the socio-economic environment should the necessary mitigation measures be implemented. It is proposed that **Alternative 1** be considered for the construction of the line.