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**PROPOSED WITTEKLEIBOSCH SWITCHING  
STATION AND 132kV POWER LINE  
LINKING TSITSIKAMMA COMMUNITY  
WIND ENERGY FACILITY TO THE  
EXTENSION OF THE DIEP RIVER  
SUBSTATION,  
EASTERN CAPE PROVINCE**

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**ENVIRONMENTAL MANAGEMENT PROGRAMME  
(EMPr)**

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**DRAFT**

Submitted as part of the Final Basic Assessment Report  
June 2014

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## PROJECT DETAILS

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<b>Title</b>	: Environmental Impact Assessment Process Environmental Management Programme: Proposed Power Line linking the proposed Tsitsikamma Community Wind Energy Facility to the Proposed Extension of the Existing Diep River Substation in the Tsitsikamma Area, Eastern Cape
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## **DEFINITIONS AND TERMINOLOGY**

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**Alien species:** A species that is not indigenous to the area or out of its natural distribution range.

**Alternatives:** Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

**Ambient sound level:** The reading on an integrating impulse sound level meter taken at a measuring point in the absence of any alleged disturbing noise at the end of a total period of at least 10 minutes after such meter was put into operation.

**Assessment:** The process of collecting, organising, analysing, interpreting and communicating information which is relevant.

**Biological diversity:** The variables among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes they belong to.

**Commence:** The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

**Cumulative impacts:** Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

**Direct impacts:** Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

**Disturbing noise:** A noise level that exceeds the ambient sound level measured continuously at the same measuring point by 7 dB or more.

**Ecosystem:** A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

**Endangered species:** Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

**Endemic:** An "endemic" is a species that grows in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

**Environment:** the surroundings within which humans exist and that are made up of:

- i. the land, water and atmosphere of the earth;
- ii. micro-organisms, plant and animal life;
- iii. any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

**Environmental Impact:** An action or series of actions that have an effect on the environment.

**Environmental impact assessment:** Environmental Impact Assessment (EIA), as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

**Environmental management:** Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

**Environmental management Programme:** An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its on-going maintenance after implementation.

**Environmental assessment practitioner:** An individual responsible for the planning, management and coordinating of environmental management plan or any other appropriate environmental instruments introduced by legislation.

**Habitat:** The place in which a species or ecological community occurs naturally.

**Hazardous waste:** Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment (Van der Linde and Feris, 2010; pg 185).

**Indigenous:** All biological organisms that occurred naturally within the study area prior to 1800

**Indirect impacts:** Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

**Interested and Affected Party:** Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.

**Pollution:** A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

**Rare species:** Taxa with small world populations that are not at present Endangered or Vulnerable, but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare".

**Red data species:** Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

**Significant impact:** An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

**Waste:** Any substance, whether or not that substance can be reduced re-used, recycled and recovered; that is surplus, unwanted, rejected, discarded, abandoned or disposed of which the generator has no further use for the purposes of production. Any product which must be treated and disposed of, that is identified as waste by the minister of Environmental affairs (by notice in the Gazette) and includes waste generated by the mining, medical or other sectors, but: A by-product is not considered waste, and portion of waste, once re-used, recycled and recovered, ceases to be waste (Van der Linde and Feris, 2010; pg 186).

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## PROJECT DESCRIPTION

## CHAPTER 1

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Tsitsikamma Community Wind Farm (Pty) Ltd obtained environmental authorisation for the proposed Tsitsikamma Community Wind Energy Facility (TCWF; DEA reference: 12/12/20/2209) on a site located approximately 30 km west of Humansdorp, in March 2012. This project was awarded preferred bidder status in May 2012 and has subsequently reached Financial Close. Construction of the TCWF is planned to commence shortly.

The authorisation for the wind energy facility included the grid connection to the Diep River substation. However, in discussions with Eskom, it was determined that this line will be required to link to the extension of Diep River Substation at a site located approximately 1 km to the west of the current substation position. As such, an application for environmental authorisation for a power line to the extension of Diep River Substation was submitted to the Department of Environmental Affairs (DEA), and an Authorisation was issued in March 2013. This Authorisation was transferred to Eskom Holdings SoC Limited in August 2013.

Eskom is in the process of securing all the power line servitudes for the implementation of the project. During the servitude negotiation process some difficulties were experienced in securing the necessary rights along the authorised power line route (refer to Figure 1.1). In order to address landowner concerns which have been raised, Eskom require a deviation of a portion of the authorised power line alignment. Eskom have therefore submitted an application for authorisation for the new proposed power line alignment to the DEA.

Eskom also requires a switching station within the footprint of the Wittekleibosch substation, contained within the Tsitsikamma Community Wind Energy Facility in order to connect the TCWF to the electricity grid. This component is also included within the application for authorisation submitted to DEA.

This Basic Assessment includes an assessment of:

- » A 132kV overhead power line connecting the Wittekleibosch substation (located within the wind farm) to the proposed extension of the Diep River Substation, a distance of approximately 13km.
- » Access roads along the servitude for construction and operation purposes.
- » a switching station within the footprint of the Wittekleibosch substation, contained within the Tsitsikamma Community Wind Energy Facility. The switching station includes an underground earth mat within and / or adjacent to the footprint of the switching station.

A broader corridor of approximately 500m wide is being considered for the proposed power line and associated infrastructure. The project is located within the Kouga Local Municipality and is proposed on the following farms: Farm 787/4; Farm 787/3; Farm 787/2; Farm 787/1; Farm 675/4; Farm 851/0; Farm 361/5; Farm 358/1; Farm 361/1; Farm 358/4; Farm 360; and Farm 954 (refer to Figure 1.2).

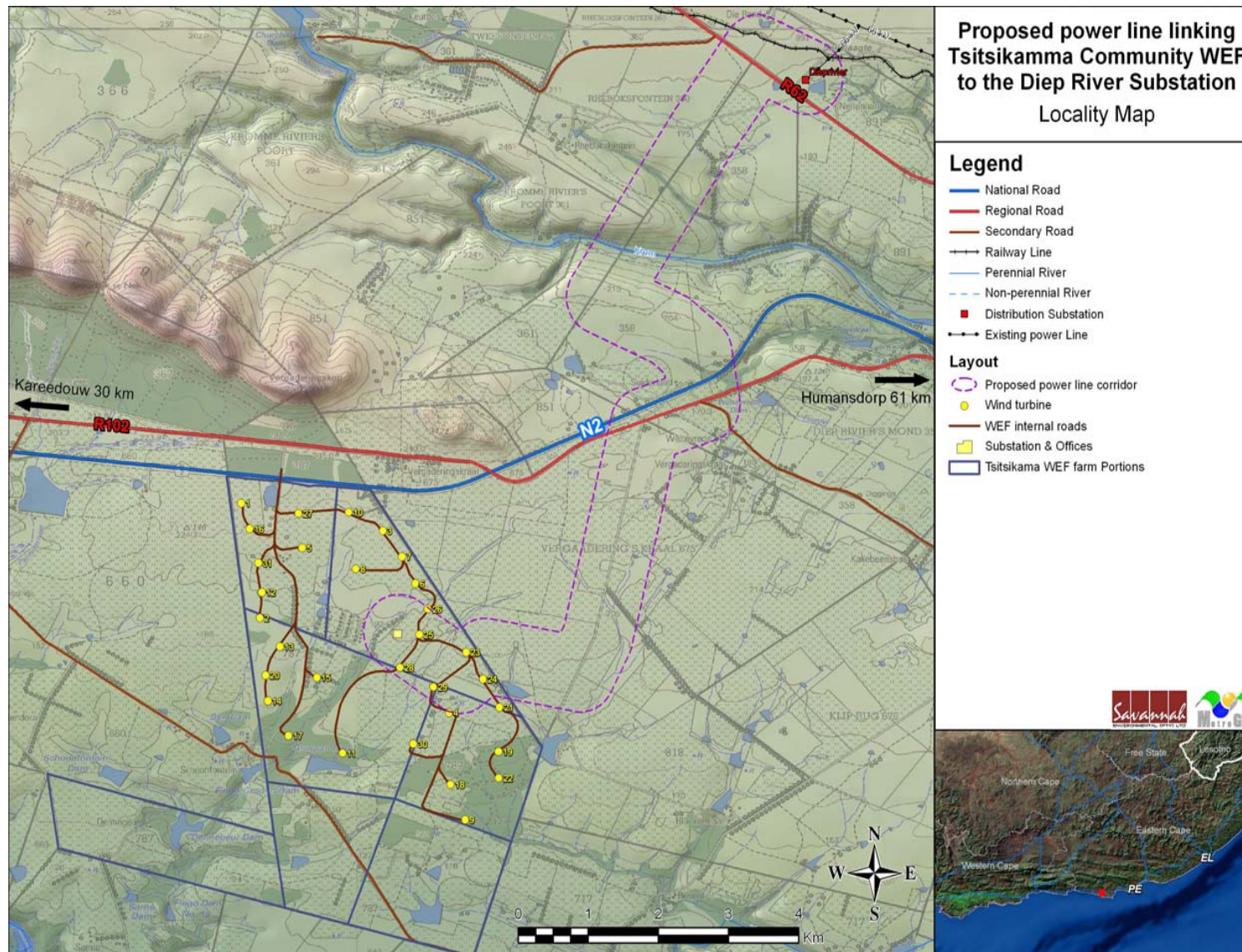
In routing the 132kV power line, it will be necessary to relocate a 450m section of an existing 22 kV power line about 15m west of the existing location. The applicable land portions in this regard are 787/3, 787/2 and 787/1. This relocation does not trigger any EIA activities, and has been agreed with the applicable parties (TDT for 787/3 and MTO for 787/1; SANRAL will be notified by Eskom when the detail design is complete), and will form part of a wayleave agreement for each party.

### 1.1. Activities and Components associated with the Proposed Power Line

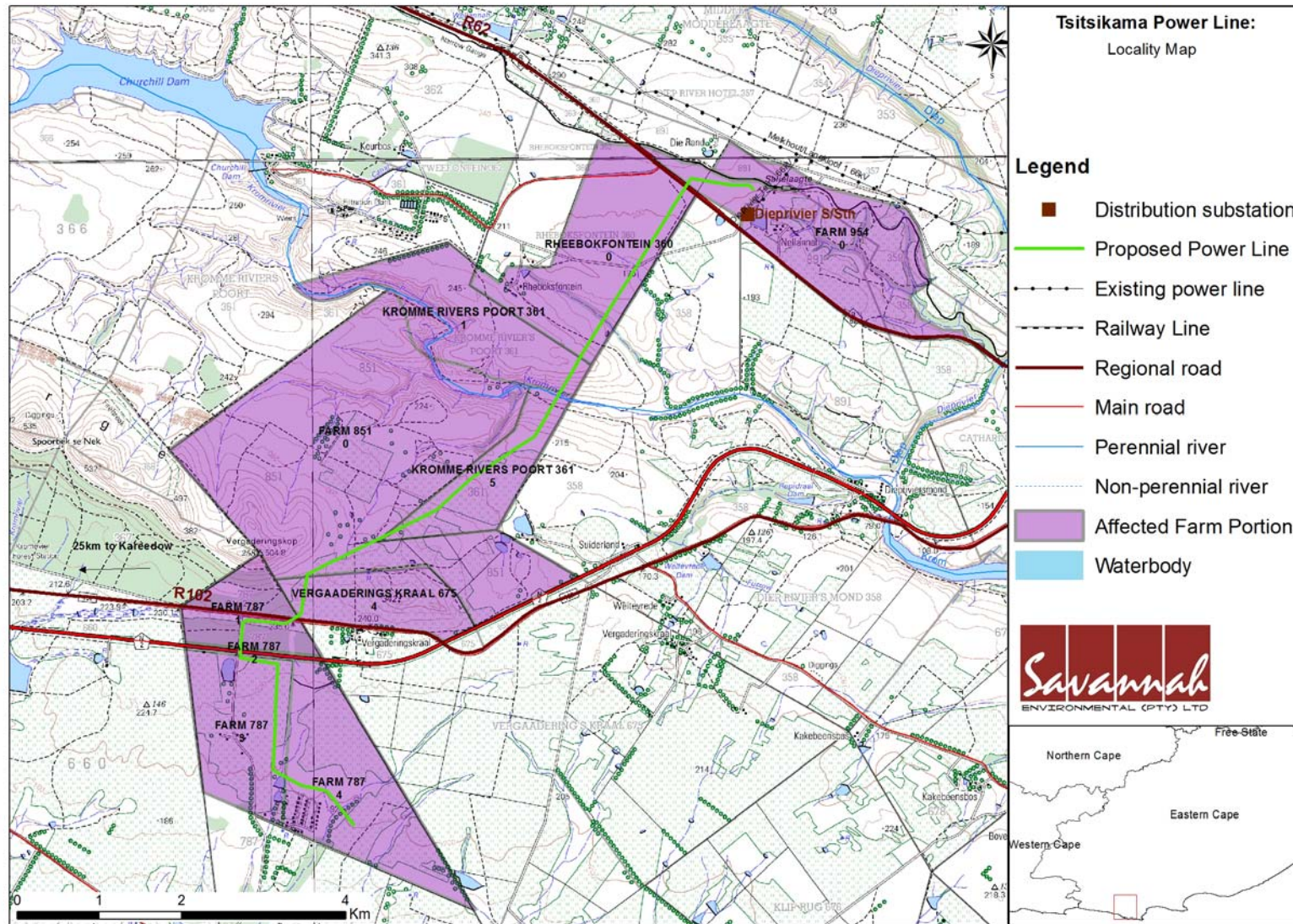
Power lines are constructed in the following simplified sequence:

- Step 1:** Survey of the route
- Step 2:** Selection of best-suited conductor, towers, insulators, foundations
- Step 3:** Final design of line and placement of towers
- Step 4:** Issuing of tenders, and award of contract to construction companies
- Step 5:** Vegetation clearance and construction of access roads (where required)
- Step 6:** Tower pegging
- Step 7:** Construction of foundations
- Step 8:** Assembly and erection of towers on site
- Step 9:** Stringing of conductors
- Step 10:** Rehabilitation of disturbed area and protection of erosion sensitive areas
- Step 11:** Testing and commissioning
- Step 12:** Continued maintenance

Construction of the power line is required to be undertaken in accordance with the specifications of this Environmental Management Programme (EMP).



**Figure 1.1:** Authorised power line corridor linking the TCWF to the proposed extension of Diep River substation



**Figure 1.2:** Proposed alternative power line corridor linking the TCWF to the proposed extension of Diep River substation

The construction of the power line will require the establishment of a construction equipment camp/s at an appropriate location along the route. The exact siting of this construction equipment camp/s is required to be negotiated with the relevant landowner, and must take cognisance of any no-go and sensitive areas identified by the Basic Assessment studies conducted for the proposed 132kV power line development (Savannah Environmental, 2014). The location of this construction equipment camp (or camps) must be approved by the project Environmental Control Officer (ECO).

The expected lifespan of the proposed power line is between 35 and 40 years, depending on the maintenance undertaken on the power line structures. During the life-span power line, on-going maintenance is performed. Power line inspections are undertaken on an average of 1 – 2 times per year, depending on the area. During this maintenance period, the line is accessed via the access routes established during the construction phase. Maintenance of the power line is required to be undertaken in accordance with the specifications of this EMP.

The management of a power line servitude is dependent on the details and conditions of the agreement between the landowner and Eskom, and are therefore site-specific. These may, therefore, vary from one location to another. However, it is a common occurrence that there is a dual responsibility for the maintenance of the servitude:

- » Eskom will be responsible for the tower structures, maintenance of access roads, watercourse crossings, and gates and fences relating to servitude access.
- » The landowner will retain responsibility for the maintenance of the land and land use within the servitude (e.g. cropping activities, veld management, etc.).

Exceptions to the above may arise where, for example dual use is made of the access roads and gates or specific land use limitations are set by Eskom within the servitude which directly affects the landowner. Maintenance responsibilities are, ultimately, clearly set out in the servitude agreement. Once agreed upon, these maintenance agreement conditions must be deemed to form part of this EMP and must be adhered to at all times.

## 1.2. Potential impacts

Potential impacts that could occur from the proposed switching station and power line (as per the conclusion of the Basic Assessment report) include:

- » **Ecology:** The potential impact is rated as having a predominately **low to medium significance**. A sensitivity analysis confirmed that the majority of the power line corridor is located in an area of low sensitivity. However, a few small patches of fynbos, as well as wetlands and watercourses (which are highly sensitive ecosystems) are present in small areas within the corridor. The alternative corridor assessed within this report presents a potentially lower impact on sensitive wetland areas as there are only two such areas within the corridor as compared with three within the currently authorised corridor. The proposed project is considered to be acceptable from an ecological perspective provided that the identified sensitive no go areas are avoided and appropriate mitigation is implemented (as recommended in the ecology specialist report).
- » **Geology, Soil, and Erosion potential:** The potential impact is rated as having a predominately **low to medium significance**. The soil erosion potential for the site is considered low due to dominant vegetation cover. However, if vegetation is removed, corrective erosion management mitigations must be established.
- » **Heritage:** The potential impact is rated as being **low** as there are few Stone Age tools located from the Early Stone Age era on the site. No sites of significance were noted in the study area.
- » **Agricultural Potential:** the potential impact is rated as being predominately **low significance**. The major impact on the natural resources of the study area would be the loss of agricultural land due to the construction of the towers for the power line. However, this impact would only be of significance if either high potential or irrigated land were to be affected. The footprint of the power line towers is relatively small and therefore the extent of the impacts would be limited. As the switching station is located within the authorised TCWF, which has already been rezoned for the purposes of the wind farm, impacts associated with this infrastructure would be insignificant.
- » **Visual:** The area visibly exposed to the switching station and the power line would include the local communities and farms within close proximity of the potential structure. Impacts associated with the switching station are considered to be insignificant as this infrastructure occurs within the wind farm development area. Impacts associated with the proposed power line could have an impact of **moderate significance**.
- » **Avifauna:** This is a relatively short length of power line, running through an area with some conflicting issues in terms of its avifauna. The proposed power line will possibly affect populations of regionally or nationally threatened (and impact susceptible) birds (mainly large terrestrial species and raptors) likely to occur within or close to the proposed alignment, and the line may have a detrimental impact on these birds, particularly in terms of collision and electrocution mortality risk, unless commitment is made to mitigating these effects. Therefore if no mitigation is followed the impacts on

birds as a result of the 132kV power line will have a **High to moderate** significance. However, with the implementation of appropriate mitigation (as recommended in the specialist studies undertaken), impacts can be reduced to **low to moderate** significance. Careful and responsible implementation of the required mitigation measures should reduce impacts to sustainable levels.

## PURPOSE AND OBJECTIVES OF THE EMPr

## CHAPTER 2

An Environmental Management Programme (EMPr) is defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts associated with the planning, construction, operation and decommissioning of a project are avoided or mitigated, and that the positive benefits of the projects are enhanced.”<sup>1</sup> The objective of this EMP is to provide consistent information and guidance for implementing the management and monitoring measures established in the permitting process and help achieve environmental policy goals. The purpose of an EMPr is to ensure continuous improvement of environmental performance, reducing negative impacts and enhancing positive effects during the construction and operation. An effective EMP is concerned with both the immediate outcome as well as the long-term impacts of the project.

The EMPr provides specific environmental guidance for the construction and operation phases of a project, and is intended to manage and mitigate construction and operation activities so that unnecessary or preventable environmental impacts do not result. These impacts range from those incurred during start up (i.e. site clearing and site establishment), during the construction activities themselves (i.e. erosion, noise, dust, and visual impacts), during site rehabilitation (i.e. soil stabilisation, re-vegetation), during operation and during decommissioning (i.e. similar to construction phase activities).

This EMP has been compiled in accordance with Section 33 of the EIA Regulations and will be further developed in terms of specific requirements listed in any authorisations issued for the proposed project. The EMPr has been developed as a set of environmental specifications (i.e. principles of environmental management), which are appropriately contextualised to provide clear guidance in terms of the on-site implementation of these specifications (i.e. on-site contextualisation is provided through the inclusion of various monitoring and implementation tools).

This EMP has the following objectives:

- » Outline mitigation measures and environmental specifications which are required to be implemented for the planning, construction and rehabilitation, operation, and decommissioning phases of the project in order to manage and

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<sup>1</sup> Provincial Government Western Cape, Department of Environmental Affairs and Development Planning: *Guideline for Environmental Management Plans*. 2005



minimise the extent of potential environmental impacts associated with the power line and switching station.

- » Ensure that all the phases of the project do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced.
- » Identify entities responsible for the implementation of the measures and outline functions and responsibilities.
- » Propose mechanisms and frequency for monitoring compliance, and preventing long-term or permanent environmental degradation.
- » Facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that was not considered in the EIA process.

The management and mitigation measures identified within the Environmental Basic Assessment (BA) process are systematically addressed in this EMP, and ensure the minimisation of adverse environmental impacts to an acceptable level.

Eskom must ensure that the implementation of the project complies with the requirements of all environmental authorisations, permits, and obligations emanating from relevant environmental legislation. This obligation is partly met through the development and the implementation of this EMPr and through its integration into the contract documentation. Since this EMPr is part of the EIA process, it is important that this document be read in conjunction with the Basic Assessment Report compiled for this project. This will contextualise the EMPr and enable a thorough understanding of its role and purpose in the integrated environmental management process. Should there be a conflict of interpretation between this EMPr and the environmental authorisation, the stipulations in the environmental authorisation shall prevail over that of the EMP, unless otherwise agreed by the authorities in writing. Similarly, any provisions in legislation overrule any provisions or interpretations within this EMPr.

This EMPr shall be binding on all the parties involved in the construction and operational phases of the project, and shall be enforceable at all levels of contract and operational management within the project.

**STRUCTURE OF THIS EMP**

**CHAPTER 3**

The first two chapters provide background to the proposed project and the EMPr, while the chapters which follow consider the following:

- » Key legislation applicable to the development;
- » Planning and design activities;
- » Construction activities;
- » Operation activities; and
- » Decommissioning activities.

These chapters set out the procedures necessary for the construction of the proposed switching station and 132kV power line to minimise environmental impacts and achieve environmental compliance. For each of the phases of implementation, an over-arching environmental **goal** is stated. In order to meet this goal, a number of **objectives** are listed. The EMP has been structured in table format in order to show the links between the goals for each phase and their associated objectives, activities/risk sources, mitigation actions, monitoring requirements and performance indicators. A specific EMP table has been established for each environmental objective. The information provided within the EMP table for each objective is outlined below.

**OBJECTIVE:** Description of the objective, which is necessary to meet the overall goals; which take into account the findings of the EIA specialist studies

<b>Project Component/s</b>	» List of project components affecting the objective.
<b>Potential Impact</b>	» Description of potential environmental impact if objective is not met.
<b>Activity/Risk Source</b>	» Description of activities which could affect achieving objective.
<b>Mitigation: Target/Objective</b>	» Description of the target and/or desired outcomes of mitigation.

Mitigation: Action/Control	Responsibility	Timeframe
List specific action(s) required to meet the mitigation target/objective described above.	Who is responsible for the measures?	Periods for implementation.

<b>Performance Indicator</b>	Description of key indicator(s) that track progress/indicate the effectiveness of the EMP.
<b>Monitoring</b>	Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods, and reporting.

The objectives and EMP tables are required to be reviewed and possibly modified whenever changes, such as the following, occur:

- » Planned activities change;
- » Modification to or addition to environmental objectives and targets;
- » Relevant legal or other requirements are changed or introduced; or
- » Significant progress has been made on achieving an objective or target such that it should be re-examined to determine if it is still relevant, should be modified, etc.

### 3.1. Project Team

This draft EMP was compiled by Jo-Anne Thomas, the principle Environmental Assessment Practitioner (EAP) for this project. Jo-Anne Thomas is a registered Professional Natural Scientist and holds a Master of Science degree. She has over 16 years experience consulting in the environmental field. Her key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. She is currently responsible for the project management of EIAs for several renewable energy and power line projects across the country.

The Savannah Environmental team have extensive knowledge and experience in EIAs and environmental management, having been involved in EIA processes over the past fourteen years. They have managed and drafted EMPs for other electricity transmission projects throughout South Africa, including major Eskom transmission lines.

## **KEY LEGISLATION APPLICABLE TO THE DEVELOPMENT      CHAPTER 4**

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The following legislation and guidelines have informed the scope and content of this EMP Report:

- » National Environmental Management Act (Act No 107 of 1998).
- » EIA Regulations, published under Chapter 5 of the NEMA (GNR R545, GNR 546 in Government Gazette 33306 of 18 June 2010).
- » Guidelines published in terms of the NEMA EIA Regulations, in particular:
  - \* Companion to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2010 (Draft Guideline; DEA, 2010).
  - \* Public Participation in the EIA Process (DEA, 2010).
  - \* Integrated Environmental Management Information Series (published by DEA)
- » International guidelines, including the Equator Principles.

Several other Acts, standards, or guidelines have also informed the project process and the scope of issues addressed and assessed in the EIA Report. A review of legislative requirements applicable to the proposed project is provided in Table 4.1.

**Table 4.1:** Relevant legislative and permitting requirements applicable to the proposed power line

Title of the Legislation /Policy/Guideline	Application to the project	Relevant Authority
National Environmental Management Act (Act No 107 of 1998)	<p>EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations.</p> <p>In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation.</p> <p>In terms of GNR 544 of June 2010, a Basic Assessment process is required to be undertaken for the proposed project</p>	<p>National Department of Environmental Affairs – lead authority.</p> <p>Provincial Environmental Department - commenting authority.</p>
National Environmental Management Act (Act No 107 of 1998)	<p>In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised.</p> <p>In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p>	<p>Department of Environmental Affairs (as regulator of NEMA).</p>
National Environmental Management: Waste Act (Act No 59 of 2008)	<p>The purpose of this Act is to reform the law regulating waste management in order to protect health and the environment by providing for the licensing and control of waste management activities. To set standards for waste management on the project. The Regulations associated with this Act detail activities which require waste licensing and also detail standards for handling and storage of waste.</p>	<p>Provincial Environmental Authorities.</p>

Title of the Legislation /Policy/Guideline	Application to the project	Relevant Authority
Environment Conservation Act (Act No 73 of 1989)	<p>In terms of section 25 of the ECA, the national noise-control regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) were promulgated. The NCRs were revised under Government Notice Number R. 55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations.</p> <p>Subsequently, in terms of Schedule 5 of the Constitution of South Africa of 1996, legislative responsibility for administering the noise control regulations was devolved to provincial and local authorities. Provincial Noise Control Regulations exist in the Free State, Western Cape and Gauteng provinces, but the Eastern Cape province have not yet adopted provincial regulations in this regard.</p> <p>Allows the Minister of Environmental Affairs to make regulations regarding noise, among other concerns</p>	National Department of Environmental Affairs Provincial Environmental Department Local Municipality
National Water Act (Act No 36 of 1998)	<p>In terms of Section 19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing or recurring.</p> <p>In terms of Section 21, a Water Use License is required to be obtained for specified listed activities (such as crossing of watercourses).</p>	Department of Water Affairs (as regulator of NWA)
National Environmental Management: Air Quality Act (Act No 39 of 2004)	<p>Sections 18, 19 and 20 of the Act allow certain areas to be declared and managed as “priority areas” in terms of air quality.</p> <p>Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards.</p> <p>Section 34 makes provision for:</p>	National Department of Environmental Affairs  Local Municipality

Title of the Legislation /Policy/Guideline	Application to the project	Relevant Authority
	<p>(1) the Minister to prescribe essential national noise standards -</p> <ul style="list-style-type: none"> <li>(a) for the control of noise, either in general or by specified machinery or activities or in specified places or areas; or</li> <li>(b) for determining –                             <ul style="list-style-type: none"> <li>(i) a definition of noise</li> <li>(ii) the maximum levels of noise</li> </ul> </li> </ul> <p>(2) When controlling noise the provincial and local spheres of government are bound by any prescribed national standards.</p>	
<p>National Heritage Resources Act (Act No 25 of 1999)</p>	<p>Section 38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including</p> <ul style="list-style-type: none"> <li>» the construction of a road, power line, pipeline, canal or other similar linear development or barrier exceeding 300 m in length;</li> <li>» any development or other activity which will change the character of a site exceeding 5 000 m<sup>2</sup> in extent.</li> </ul> <p>The relevant Heritage Resources Authority must be notified of developments such as linear developments (such as roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m<sup>2</sup>; or the re-zoning of a site exceeding 10 000 m<sup>2</sup> in extent. This notification must be provided in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided.</p> <p>Standalone HIAs are not required where an EIA is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of Section 38. In such cases only those components not addressed by the EIA should be covered by the heritage component.</p>	<p>South African Heritage Resources Agency (SAHRA)</p> <p>– National heritage sites (grade 1 sites) as well as all historic graves and human remains.</p>

Title of the Legislation /Policy/Guideline	Application to the project	Relevant Authority
Nature Conservation Ordinance (Act 19 of 1974)	<p>Article 63 prohibits the picking of certain fauna (including cutting, chopping, taking, gathering, uprooting, damaging or destroying). Schedule 3 lists endangered flora and Schedule 4 lists protected flora, many schedule 4 plants occur in the general area of the site.</p> <p>An article 26 to 47 regulates the use of wild animals.</p>	National Department of Environmental Affairs
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	<p>In terms of Section 57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007.</p> <p>In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA phase.</p> <p>the developer has a responsibility for:</p> <ul style="list-style-type: none"> <li>» The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations).</li> <li>» Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all development within the area are in line with ecological sustainable</li> </ul>	National Department of Environmental Affairs  Eastern Cape DEDEAT



Title of the Legislation /Policy/Guideline	Application to the project	Relevant Authority
	<p>development and protection of biodiversity.</p> <ul style="list-style-type: none"> <li>» Limit further loss of biodiversity and conserve endangered ecosystems.</li> </ul>	
<p>Conservation of Agricultural Resources Act (Act No 43 of 1983)</p>	<p>Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories:</p> <ul style="list-style-type: none"> <li>» <u>Category 1 plants</u>: are prohibited and must be controlled.</li> <li>» <u>Category 2 plants</u>: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread.</li> <li>» <u>Category 3 plants</u>: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands.</li> </ul> <p>These regulations provide that Category 1, 2 and 3 plants must not occur on land and that such plants must be controlled by the methods set out in Regulation 15E.</p>	<p>Department of Agriculture, Forestry and Fisheries</p>
<p>National Veld and Forest Fire Act (Act 101 of 1998)</p>	<p>In terms of Section 12, the applicant would be obliged to burn firebreaks to ensure that should a veld fire occur on the property, that it does not spread to adjoining land.</p> <p>In terms of section 13 the applicant must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material.</p> <p>In terms of section 17, the applicant must have such equipment,</p>	<p>Department of Agriculture, Forestry and Fisheries</p>

Title of the Legislation /Policy/Guideline	Application to the project	Relevant Authority
	protective clothing and trained personnel for extinguishing fires.	
National Forests Act (Act No 84 of 1998)	<p>Protected trees: According to this act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that ' no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'.</p> <p>Forests: Prohibits the destruction of indigenous trees in any natural forest without a licence.</p>	Department of Agriculture, Forestry and Fisheries

**MANAGEMENT PROGRAMME: PRECONSTRUCTION**

**CHAPTER 5**

**Overall Goal:** undertake the pre-construction (planning and design) phase in a way that:

- » Ensures that the design responds to the identified environmental constraints and opportunities.
- » Ensures that pre-construction activities are undertaken in accordance with all relevant legislative requirements
- » Ensures that adequate regard has been taken of any landowner and community concerns and that these are appropriately addressed through design and planning (where appropriate).
- » Ensures that the best environmental options are selected for the linear components, including the access roads and power line alignments.
- » Enables the construction activities to be undertaken without significant disruption to other land uses and activities in the area.

In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

**5.1 Objectives**

**OBJECTIVE P1: Ensure the design responds to identified environmental constraints and opportunities**

In order to minimise impacts associated with the construction and operation of the power line, the following is required to be undertaken during the final design phase:

- » Geotechnical survey – this will investigate foundation conditions and the availability of natural construction materials.
- » Specialist walk-through surveys – undertake ecological and avifauna walk through surveys once final power line alignment and tower positions are known.

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Power line</li> <li>» Switching station</li> <li>» Access roads</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Soil erosion</li> <li>» Loss of agricultural land</li> </ul>

	» Impacts on ecology & birds » Impact on heritage sites
<b>Activities/Risk Sources</b>	» Positioning of all the facilities components
<b>Mitigation: Target/Objective</b>	» The design responds to the identified environmental constraints and opportunities

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Undertake negotiations with affected landowners and agree on landowner-specific conditions for construction and maintenance	Eskom	Project planning
Undertake specialist walk through surveys – ecology and avifauna.	Eskom Specialists	Design
Undertake a detailed geotechnical survey of the proposed switching station and power line tower positions in order to fully understand the soils in terms of founding conditions and erosion potential.	Eskom	Design
Obtain any additional environmental permits required	Eskom	Project planning
<u>The routing takes the line through a section of declared state forest land. The use must therefore be licensed in terms of section 23 of the National Forests Act. As part of this license agreement, there must be agreement regarding who takes responsibility for maintaining the servitude area and at whose costs</u>	<u>Eskom</u>	<u>Project planning</u>
Ensure that the power line does not hinder any centre pivot system or other irrigation systems	Eskom	Project planning
Bird-friendly power line tower and conductor designs must be used. The tower designs used should be those which are poorly suited to serve as nesting sites by most bird species and with perching areas situated in areas either off-set or well away from the conductors.	Eskom	Design phase
Ensure that erosion mitigation measures are considered in the construction when planning the project.	Eskom	Design
Ensure that riparian areas are spanned/ pole structures are not placed within proximity to rivers, streams. Ensure placement of footprints outside 1:100 year floodline.	Eskom	Design
Identify the exact power line spans requiring marking to reduce the potential for collision of avifauna.	Eskom Specialist	Design
<u>Agree on and draft a communication protocol in emergency events, specifically in the area where the power line passes through the declared state forest.</u>	<u>Eskom</u>	<u>Project planning</u>

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» The design meets the objectives and does not degrade the environment.</li> <li>» Design and layouts respond to the mitigation measures and recommendations in the BA Report.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Review of the design by the Project Manager prior to the commencement of construction.</li> <li>» Review of the alignment of the servitude by the Environmental Control Officer (ECO) prior to the commencement of construction.</li> </ul>

### OBJECTIVE P2: To ensure effective communication mechanisms

On-going communication with affected and surrounding landowners is important to maintain during the construction and operational phases of the activity. Any issues and concerns raised should be addressed as far as possible in as short a timeframe as possible.

<b>Project component/s</b>	» Watercourse crossings
<b>Potential Impact</b>	» Impacts on affected and surrounding landowners and land uses
<b>Activity/risk source</b>	» Activities associated with construction of watercourse crossings
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Effective communication with affected and surrounding landowners</li> <li>» Addressing of any issues and concerns raised as far as possible in as short a timeframe as possible</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Compile and implement a grievance mechanism procedure for the public (as outlined in <b>Appendix A</b> ) to be implemented during both the construction and operational phases of the facility. This procedure should include details of the contact person who will be receiving issues raised by interested and affected parties, and the process that will be followed to address issues. This procedure should be in line with the South African Labour Law.	Eskom	Pre-construction
Liaison with landowners is to be undertaken prior to the commencement of construction in order to provide sufficient time for them to plan land use activities accordingly.	Eskom	Pre-construction

<b>Performance Indicator</b>	» Effective communication procedures in place.
<b>Monitoring</b>	» An incident reporting system should be used to record non-conformances to the EMPr. » Public complaints register must be developed and maintained.

### OBJECTIVE P3: Search and Rescue of All Translocatable Indigenous Plants

Prior to any earthworks (including road construction) within areas of natural vegetation, a plant Search and Rescue program should be developed and implemented. The section below provides a guideline for the Search & Rescue Plan on site and will need to be supplemented with the relevant methodology depending on the final placement of infrastructure

<b>Project Component/s</b>	» Power line » Access roads » Switching station
<b>Potential Impact</b>	Loss of natural vegetation and faunal habitats
<b>Activities/Risk Sources</b>	Construction related loss and damage to remaining natural vegetation due to heavy machinery, trampling, etc.
<b>Mitigation: Target/Objective</b>	Rescue, maintenance and subsequent replanting of natural vegetation in all development footprints within any areas of natural vegetation

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Search and Rescue (S&R) of translocatable, selected plants occurring in long term and permanent, hard surface development footprints should take place. All such development footprints must be surveyed and pegged out as soon as possible, and then suitably qualified specialist with Search and Rescue experience should be appointed to undertake the S&R. All rescued species should be translocated to a suitable habitat or removed to a nursery.	Eskom Specialist	Pre-construction
Compile a site rehabilitation plan for implementation.	Eskom Specialist	Pre-construction

<b>Performance Indicator</b>	» No disturbance outside of designated work areas. » Minimised clearing of existing/natural vegetation. » Limited impacts on areas of identified and demarcated sensitive habitats/vegetation.
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**Monitoring**

- » Monitoring of vegetation clearing activities in terms of any relevant permit conditions.
- » Supervision of all clearing and earthworks by ECO.
- » An incident reporting system must be used to record non-conformances to the EMPr.

**Overall Goal:** Undertake the construction phase in a way that:

- » Ensures that construction activities are properly managed in respect of environmental aspects and impacts.
- » Enables construction activities to be undertaken without significant disruption to other land uses and activities in the area, in particular concerning noise impacts, farming practices, traffic and road use, and effects on local residents.
- » Minimises the impact on the indigenous natural vegetation, and habitats of ecological value.
- » Minimises impacts on fauna (including birds) in the study area.
- » Minimises the impact on heritage sites should they be uncovered.
- » Establishes an environmental baseline during construction activities on the site, where possible.

### **6.1 Institutional Arrangements: Roles and Responsibilities for the Construction Phase**

As the proponent, Eskom must ensure that the project complies with the requirements of all environmental authorisations and permits, and obligations emanating from other relevant environmental legislation. This obligation is partly met through the development of the EMP, and the implementation of the EMP through its integration into the contract documentation. Eskom will retain various key roles and responsibilities during the construction phase.

**OBJECTIVE C1: Establish clear reporting, communication, and responsibilities in relation to overall implementation of the EMP**

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Project Manager; Site Manager; Safety, Health and Environment Representative; Environmental Control Officer (ECO) and Contractor for the construction phase of this project are as detailed below.



**Project Manager** will:

- » Ensure all specifications and legal constraints specifically with regards to the environment are highlighted to the Contractor(s) so that they are aware of these.
- » Ensure that Eskom and its Contractor(s) are made aware of all stipulations within the EMP.
- » Ensure that the EMP is correctly implemented throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes.
- » Be fully conversant with the EIA for the project, the EMP, the conditions of the Environmental Authorisation (once issued), and all relevant environmental legislation.

**Site Manager** (Eskom's on-site Representative) will:

- » Be fully knowledgeable with the contents of the EIA and risk management.
- » Be fully knowledgeable with the contents and conditions of the Environmental Authorisation (once issued).
- » Be fully knowledgeable with the contents of the EMP.
- » Be fully knowledgeable with the contents of all relevant environmental legislation, and ensure compliance with these.
- » Have overall responsibility of the EMP and its implementation.
- » Conduct audits to ensure compliance to the EMP.
- » Ensure there is communication with the Project Manager, the ECO, and relevant discipline engineers on matters concerning the environment.
- » Ensure that no actions are taken which will harm or may indirectly cause harm to the environment, and take steps to prevent pollution on the site.
- » Confine activities to the demarcated construction site.

**Environmental Control Officer** (ECO) (independent of Eskom) will be responsible for monitoring, reviewing, and verifying compliance by the Contractor with the environmental specification and accordingly will:

- » Be fully knowledgeable with the contents with the Basic Assessment.
- » Be fully knowledgeable with the contents with the conditions of the Environmental Authorisation (once issued).
- » Be fully knowledgeable with the contents with the EMP.
- » Be fully knowledgeable with the contents with all relevant environmental legislation, and ensure compliance with them.
- » Ensure that the contents of this document are communicated to the Contractor site staff and that the Site Manager and Contractor are constantly made aware of the contents through discussion.

- » Ensure that the compliance of the EMP is monitored through regular and comprehensive inspection of the site and surrounding areas.
- » Ensure that if the EMP conditions or specifications are not followed then appropriate measures are undertaken to address this.
- » Monitoring and verification must be implemented to ensure that environmental impacts are kept to a minimum, as far as possible.
- » Ensure that the Site Manager has input into the review and acceptance of construction methods and method statements.
- » Ensure that activities on site comply with all relevant environmental legislation.
- » Ensure that a removal is ordered of any person(s) and/or equipment responsible for any contravention of the specifications of the EMP.
- » Ensure that the compilation of progress reports for submission to the Project Manager, with input from the Site Manager, takes place on a regular basis, including a final post-construction audit.
- » Ensure that there is communication with the Site Manager regarding the monitoring of the site.
- » Ensure that any non-compliance or remedial measures that need to be applied are reported.
- » Independently report to DEA in terms of compliance with the specifications of the EMP and conditions of the Environmental Authorisation (once issued).

As a general mitigation strategy, the Environmental Control Officer (ECO) should be present for the site preparation and initial clearing activities to ensure the correct demarcation of no-go areas, facilitate environmental induction with construction staff and supervise any flora relocation and faunal rescue activities that may need to take place during the site clearing (i.e. during site establishment, and excavation of foundations). Thereafter weekly site compliance inspections would probably be sufficient. However, in the absence of the ECO there should be a designated environmental officer present to deal with any environmental issues that may arise such as fuel or oil spills. The ECO shall remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site handed over for operation.

**Contractors and Service Providers:** It is important that contractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMP. The contractor is responsible for informing employees and sub-contractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts. The contractor's obligations in this regard include the following:

- » Employees must have a basic understanding of the key environmental features of the construction site and the surrounding environment.
- » A copy of the EMP must be easily accessible to all on-site staff members.
- » Employees must be familiar with the requirements of this EMP and the environmental specifications as they apply to the construction of the power line.
- » Prior to commencing any site works, all employees and sub-contractors must have attended an environmental awareness training course which must provide staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
- » Staff will be informed of environmental issues as deemed necessary by the ECO.

All contractors (including sub-contractors and staff) and service providers are ultimately responsible for:

- » Ensuring adherence to the environmental management specifications.
- » Ensuring that Method Statements are submitted to the Site Manager (and ECO) for approval before any work is undertaken.
- » Any lack of adherence to the above will be considered as non-compliance to the specifications of the EMP.
- » Ensuring that any instructions issued by the Site Manager on the advice of the ECO are adhered to.
- » Ensuring that a report is tabled at each site meeting, which will document all incidents that have occurred during the period before the site meeting.
- » Ensuring that a register is kept in the site office, which lists all transgressions issued by the ECO.
- » Ensuring that a register of all public complaints is maintained.
- » Ensuring that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the EMP (i.e. ensure their staff are appropriately trained as to the environmental obligations).

**Contractor's Environmental Representative:** The Contractor's Environmental Representative (CER), employed by the Principle Contractor, is responsible for managing the day-to-day on-site implementation of this EMPr, and for the compilation of regular (usually weekly) Monitoring Reports. In addition, the CER must act as liaison and advisor on all environmental and related issues and ensure that any complaints received from the public are duly recorded and forwarded to the Site Manager and Contractor.

The Contractor's Environmental Representative should:

- » Be well versed in environmental matters.
- » Understand the relevant environmental legislation and processes.
- » Understand the hierarchy of Environmental Compliance Reporting, and the implications of Non-Compliance.
- » Know the background of the project and understand the implementation programme.
- » Be able to resolve conflicts and make recommendations on site in terms of the requirements of this Specification.
- » Keep accurate and detailed records of all EMPr-related activities on site.

## 6.2 Objectives

In order to meet the overall goal for construction, the following objectives, actions, and monitoring requirements have been identified.

### OBJECTIVE C2: Minimise impacts related to inappropriate site establishment

The Contractor must take all reasonable measures to ensure the safety of the public in the surrounding area.

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Power line towers</li> <li>» Access roads</li> <li>» Switching station</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Hazards to landowners and public.</li> <li>» Damage to indigenous natural vegetation, due largely to ignorance of where such areas are located.</li> <li>» Loss of threatened plant species</li> </ul>
<b>Activities/Risk Sources</b>	<ul style="list-style-type: none"> <li>» Excavations.</li> <li>» Movement of construction vehicles in the area and on-site.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To secure the site against unauthorised entry.</li> <li>» To protect members of the public/landowners/residents.</li> <li>» No loss of or damage to sensitive vegetation in areas outside the immediate development footprint.</li> </ul>

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Secure site, working areas and excavations in an appropriate manner, as agreed with the ECO.	Contractor	Site establishment, and duration of construction

Mitigation: Action/Control	Responsibility	Timeframe
Where necessary control access, fence, and secure area.	Contractor	Site establishment, and duration of construction
Fence and secure contractor's equipment camp.	Contractor	Site establishment
Where the public could be exposed to danger by any of the works or site activities, the contractor must, as appropriate, provide suitable flagmen, barriers and/or warning signs in English, Afrikaans and any other relevant local languages, all to the approval of the Site Manager.	Contractor	Site establishment and duration of construction
All unattended open excavations shall be adequately demarcated and/or fenced. Adequate protective measures must be implemented to prevent unauthorised access to the working area and the internal access/haul routes.	Contractor	Site establishment and duration of construction
Establish appropriately bunded areas for storage of hazardous materials (i.e. fuel to be required during construction).	Contractor	Site establishment
All development footprints should be appropriately fenced off and clearly demarcated.	Contractor	Site establishment, and duration of construction
Establish the necessary ablution facilities with chemical toilets and provide adequate sanitation facilities and ablutions for construction workers (1 toilet per every 15 workers) at appropriate locations on site.	Contractor	Site establishment, and duration of construction
Ablution or sanitation facilities should not be located within 100 m from a 1:100 year flood line including drainage lines.	Contractor	Site establishment, and duration of construction
Supply adequate (closable, tamper proof) waste collection bins at site where construction is being undertaken. Separate bins should be provided for general and hazardous waste. As far as possible, provision should be made for separation of waste for recycling.	Contractor	Site establishment, and duration of construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Site is secure and there is no unauthorised entry.</li> <li>» No members of the public/ landowners injured.</li> <li>» Appropriate and adequate waste management and sanitation facilities provided at construction site.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» An incident reporting system will be used to record non-</li> </ul>

	<p>conformances to the EMP.</p> <ul style="list-style-type: none"> <li>» ECO to monitor all construction areas on a continuous basis until all construction is completed. Non-conformances will be immediately reported to the site manager.</li> </ul>
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**OBJECTIVE C3: Appropriate management of the construction site and construction workers**

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Power line infrastructure</li> <li>» Access roads</li> <li>» Switching station</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Damage to indigenous natural vegetation and sensitive areas.</li> <li>» Damage to and/or loss of topsoil (i.e. pollution, compaction etc.).</li> <li>» Impacts on the surrounding environment due to inadequate sanitation and waste removal facilities.</li> <li>» Pollution/contamination of the environment.</li> </ul>
<b>Activities/Risk Sources</b>	<ul style="list-style-type: none"> <li>» Vegetation clearing and levelling of equipment storage area/s.</li> <li>» Access to and from the equipment storage area/s.</li> <li>» Ablution facilities.</li> <li>» Contractors not aware of the requirements of the EMP, leading to unnecessary impacts on the surrounding environment.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Limit equipment storage within demarcated designated areas.</li> <li>» Ensure adequate sanitation facilities and waste management practices.</li> <li>» Ensure appropriate management of actions by on-site personnel in order to minimise impacts to the surrounding environment.</li> </ul>

Mitigation: Action/Control	Responsibility	Timeframe
As far as possible, minimise vegetation clearing and levelling for equipment storage areas.	Contractor	Site establishment, and during construction
Rehabilitate all disturbed areas at the construction equipment camp as soon as construction is complete within an area.	Contractor	Duration of Contract
Ensure waste removal facilities are maintained and emptied on a regular basis.	Contractor	Site establishment, and duration of construction
The terms of this EMP and the Environmental Authorisation (once issued) must be included in all	Contractor	Tender process

Mitigation: Action/Control	Responsibility	Timeframe
tender documentation and Contractors contracts		
Ensure that all personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm. This can be achieved through the provision of appropriate environmental awareness training to all personnel. Records of all training undertaken must be kept.	Contractor	Duration of construction
Contractors must use chemical toilets/ablation facilities situated at designated areas of the site; no ablation activities will be permitted outside the designated areas. These facilities must be regularly serviced by appropriate contractors. A minimum of one toilet shall be provided per 15 persons at each working area such as the Contractor's camp	Contractor and sub-contractor/s	Duration of contract
Cooking and eating of meals must take place in a designated area. No firewood or kindling may be gathered from the site or surrounds.	Contractor and sub-contractor/s	Duration of contract
All litter must be deposited in a clearly marked, closed, animal-proof disposal bin in the construction area. Particular attention needs to be paid to food waste.	Contractor and sub-contractor/s	Duration of contract
No one other than the ECO or personnel authorised by the ECO may disturb flora or fauna outside of the demarcated construction area/s.	Contractor and sub-contractor/s	Duration of contract
Fire fighting equipment and training must be provided before the construction phase commences.	Contractor and sub-contractor/s	Duration of contract
Draft Code of conduct for construction workers.	Contractor and sub-contractor/s	Pre-construction
Contractors must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.	Contractor and sub-contractor/s	Construction
On completion of the construction phase, all construction workers must leave the site within one week of their contract ending.	Contractor and sub-contractor/s	Construction

**Performance Indicator**

- » Construction equipment camps have avoided sensitive areas, as approved by the ECO.
- » Ablution and waste removal facilities are in a good working order and do not pollute the environment due to mismanagement.

	<ul style="list-style-type: none"> <li>» All areas are rehabilitated promptly after construction in an area is complete.</li> <li>» No complaints regarding contractor behaviour or habits.</li> <li>» Appropriate training of all staff is undertaken prior to them commencing work on the construction site.</li> <li>» Code of Conduct drafted before commencement of construction phase.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Regular audits of the construction camps and areas of construction on site by the ECO.</li> <li>» Proof of disposal of sewage at an appropriate wastewater treatment works.</li> <li>» An incident reporting system should be used to record non-conformances to the EMP.</li> <li>» Observation and supervision of Contractor practices throughout construction phase by the ECO.</li> <li>» Complaints will be investigated and, if appropriate, acted upon.</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>

**OBJECTIVE C4: Minimise impacts related to traffic management and transportation of equipment and materials to site**

The construction phase of the project will be the most significant in terms of generating traffic impacts; resulting from the transport of equipment and materials and construction crews to the site and the return of the vehicles after delivery of materials.

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Delivery of any component required within the construction phase.</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Impact of heavy construction vehicles on road surfaces, and possible increased risk in accidents involving people and animals.</li> <li>» Traffic congestion, particularly on narrow roads or on road passes where overtaking is not permitted.</li> <li>» Deterioration of road pavement conditions (both surfaced and gravel road) due to abnormal loads.</li> </ul>
<b>Activities/Risk Sources</b>	<ul style="list-style-type: none"> <li>» Construction vehicle movement.</li> <li>» Speeding on local roads.</li> <li>» Degradation of local road conditions.</li> <li>» Site preparation and earthworks.</li> <li>» Foundations or plant equipment installation.</li> <li>» Transportation of ready-mix cement from off-site batching</li> </ul>



	<p>plant to the site.</p> <ul style="list-style-type: none"> <li>» Mobile construction equipment movement on-site.</li> <li>» Power line construction activities.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Minimise impact of traffic on local traffic volume, existing infrastructure, property owners, animals, and road users.</li> <li>» To ensure all vehicles are roadworthy and all materials/equipment are transported appropriately and within any imposed permit/licence conditions.</li> </ul>

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Appropriate dust suppression techniques must be implemented to minimise dust from gravel roads.	Contractor	Construction
Construction vehicles and those transporting materials and goods should be inspected by the contractor or a sub-contractor to ensure that these are in good working order and not overloaded.	Contractor	Construction
Strict vehicle safety standards should be implemented and monitored.	Contractor	Construction
All relevant permits for abnormal loads must be applied for from the relevant authority.	Contractor (or appointed transportation contractor)	Pre-construction
A designated access to the proposed site must be created to ensure safe entry and exit.	Contractor	Pre-construction
No deviation from approved transportation routes must be allowed, unless roads are closed for whatever reason outside the control of the contractor.	Contractor	Duration of contract
Appropriate road management strategies must be implemented on external and internal roads with all employees and contractors required to abide by standard road and safety procedures.	Contractor (or appointed transportation contractor)	Pre-construction
Any traffic delays resulting from the presence of construction traffic must be co-ordinated with the appropriate authorities.	Contractor	Duration of contract
The movement of all vehicles within the site must be on designated roadways.	Contractor	Duration of contract
Signage must be established at appropriate points warning of turning traffic and the construction site (all signage to be in accordance with prescribed standards).	Contractor	Duration of contract
Appropriate maintenance of all vehicles of the contractor must be ensured.	Contractor	Duration of contract
All vehicles of the contractor travelling on public roads must adhere to the specified speed limits and all drivers must be in possession of an appropriate valid	Contractor	Duration of contract

Mitigation: Action/Control	Responsibility	Timeframe
driver's license.		

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Vehicles keeping to the speed limits.</li> <li>» Vehicles are in good working order and safety standards are implemented.</li> <li>» Local residents and road users are aware of vehicle movements and schedules.</li> <li>» No construction traffic related accidents are experienced.</li> <li>» Local road conditions and road surfaces are up to standard.</li> <li>» Complaints of residents are not received (e.g. concerning the speeding of heavy vehicles).</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Developer and or appointed ECO must monitor indicators listed above to ensure that they have been implemented.</li> </ul>

**OBJECTIVE C5: To avoid and or minimise the potential impact of the activities during the construction on the safety of local communities and the potential loss of stock and damage to farm infrastructure**

An inflow of workers could, as a worst case scenario and irrespective of the size of the workforce, pose some security risks. Criminals could also use the opportunity due to "outsiders" being in the area to undertake their criminal activities.

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Construction and establishment activities</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Impact on safety of farmers and communities (increased crime etc.) and potential loss of livestock due to stock theft by construction workers and also damage to farm infrastructure, such as gates and fences.</li> <li>» Impact on irrigated fields</li> </ul>
<b>Activities/Risk Sources</b>	<ul style="list-style-type: none"> <li>» The presence of construction workers on the site can pose a potential safety risk to local farmers and communities and may result in stock thefts. The activities of construction workers may also result in damage to farm infrastructure.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To avoid and or minimise the potential impact on local communities and their livelihoods.</li> </ul>

Mitigation: Action/Control	Responsibility	Timeframe
The housing of construction workers on the site should be limited to security personnel.	Contractor	Construction
Ensure that all farm gates are locked and secure at all	Contractor	Construction

Mitigation: Action/Control	Responsibility	Timeframe
times.		
Ensure that no construction hinders the function of pivot irrigation systems.	Contractor	Construction
Inform all landowners of activity on their land at least 2 days in advance of planned activities.	Contractor	Construction
The construction site should be fenced and access to the area controlled.	Contractor	Construction
Procedures and measures to prevent, and in worst cases, attend to fires should be developed in consultation with the surrounding property owners and the local municipality	Contractor	Construction
Contact details of emergency services should be prominently displayed on site.	Contractor	Construction
Appropriate fire-fighting equipment must be present on site and members of the workforce should be appropriately trained in using this equipment in the fighting of veld fires	Contractor	Construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No criminal activities and theft of livestock are reported.</li> <li>» No fires or on-site accidents occur.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Developer and appointed ECO must monitor indicators listed above to ensure that they have been implemented.</li> </ul>

## OBJECTIVE C6: Management of dust and air emissions

During the construction phase, limited gaseous or particulate emissions are anticipated from exhaust emissions from construction vehicles and equipment on-site, as well as vehicle entrained dust from the movement of vehicles on the main and internal access roads.

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Construction activities associated with the area and linear infrastructure.</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Dust and particulates from vehicle movement to and on-site, foundation excavation, road construction activities, road maintenance activities, temporary stockpiles, and vegetation clearing affecting the surrounding residents and visibility.</li> <li>» Release of minor amounts of air pollutants (for example NO<sub>2</sub>, CO and SO<sub>2</sub>) from vehicles and construction equipment</li> </ul>
<b>Activities/Risk Sources</b>	<ul style="list-style-type: none"> <li>» Clearing of vegetation and topsoil.</li> <li>» Excavation, grading, scraping, levelling, digging, drilling.</li> </ul>

	<ul style="list-style-type: none"> <li>» Transport of materials, equipment, and components on internal access roads.</li> <li>» Re-entrainment of deposited dust by vehicle movements.</li> <li>» Wind erosion from topsoil and spoil stockpiles and unsealed roads and surfaces.</li> <li>» Fuel burning vehicle and construction engines.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To ensure emissions from all vehicles and construction engines are minimised, where possible, for the duration of the construction phase</li> <li>» To minimise nuisance to the community from dust emissions and to comply with workplace health and safety requirements for the duration of the construction phase</li> </ul>

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Roads must be maintained in a manner that will ensure that nuisance from dust emissions from road or vehicle sources are not visibly excessive.	Contractor	Construction
Ensure that any damage to roads because of construction activities is repaired before completion of the construction phase.	Contractor	Construction
Appropriate dust suppressant must be applied on all exposed areas and stockpiles as required to minimise/control airborne dust.	Contractor	Construction
Haul vehicles moving outside the construction site carrying material that can be wind-blown must be covered with tarpaulins if required by the wind conditions.	Contractor	Construction
Speed of construction vehicles must be restricted, as defined by the ECO.	Contractor	Construction
Dust-generating activities or earthworks may need to be rescheduled or the frequency of application of dust control/suppressant increased during periods of high winds if visible dust is blowing toward nearby residences outside the site.	Contractor	Construction
Strictly control vibration pollution from compaction plant or excavation plant.	Contractor	Construction
Disturbed areas must be re-vegetated as soon as practicable once construction in an area is completed.	Contractor	Construction
Vehicles and equipment must be maintained in a road-worthy condition at all times.	Contractor	Construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No complaints from affected or surrounding residents or community regarding dust or vehicle emissions.</li> <li>» Dust suppression measures implemented for all heavy vehicles that require such measures during the construction phase</li> </ul>
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	<p>commences.</p> <ul style="list-style-type: none"> <li>» Drivers made aware of the potential safety issues and enforcement of strict speed limits when they are employed.</li> <li>» All heavy vehicles equipped with speed monitors before they are used in the construction phase in accordance with South African vehicle legislation.</li> <li>» Road worthy certificates in place for all heavy vehicles at outset of construction phase and up-dated on a monthly basis.</li> </ul>
<b>Monitoring</b>	<p>Monitoring must be undertaken to ensure emissions are not exceeding the prescribed levels via the following methods:</p> <ul style="list-style-type: none"> <li>» Immediate reporting by personnel of any potential or actual issues with nuisance dust or emissions to the Site Manager.</li> <li>» A complaints register must be maintained, in which any complaints from residents/the community will be logged, and thereafter complaints will be investigated and, where appropriate, acted upon.</li> <li>» An incident reporting system must be used to record non-conformances to the EMP.</li> </ul>

**OBJECTIVE C7: Minimisation of development footprint and disturbance to topsoil**

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Power line</li> <li>» Access roads</li> <li>» Switching station</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Impacts on natural vegetation.</li> <li>» Impacts on soil.</li> <li>» Loss of topsoil.</li> </ul>
<b>Activity/Risk Source</b>	<ul style="list-style-type: none"> <li>» Site preparation and earthworks.</li> <li>» Excavation of foundations.</li> <li>» Construction of site access road.</li> <li>» Site preparation (e.g. compaction).</li> <li>» Power line construction activities.</li> <li>» Stockpiling of topsoil, subsoil and spoil material.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To retain natural vegetation, where possible.</li> <li>» To minimise footprints of disturbance of vegetation/habitats.</li> <li>» Remove and store all topsoil on areas that are to be excavated; and use this topsoil in subsequent rehabilitation of disturbed areas.</li> <li>» Minimise spoil material.</li> </ul>

Mitigation: Action/Control	Responsibility	Timeframe
Areas to be cleared must be clearly marked on-site to eliminate the potential for unnecessary clearing.	Contractor in consultation with Specialist	Pre-construction
The extent of clearing and disturbance to the native vegetation must be kept to a minimum so that impact on flora and fauna and their habitats is restricted.	Contractor	Site establishment & duration of contract
Construction activities must be restricted to demarcated areas so that impact on flora and fauna is restricted.	Contractor	Site establishment & duration of contract
Any fill material required must be sourced from a commercial off-site suitable/permitted source, quarry or borrow pit. Where possible, material from foundation excavations must be used as fill on-site.	Contractor	Duration of contract
Excavated topsoil must be stockpiled in designated areas separate from base material at a maximum height and covered until replaced during rehabilitation.	Contractor	Site establishment & duration of contract
Topsoil must not be stripped or stockpiled when it is raining or when the soil is wet as compaction will occur.	Contractor	Site establishment Maintenance: for duration of contract
As far as possible, the maximum topsoil stockpile height must not exceed 2 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.	Contractor	Duration of contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Minimal disturbance outside of designated work areas.</li> <li>» Minimise clearing of existing vegetation.</li> <li>» Topsoil appropriately stored.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation of vegetation clearing and soil management activities by ECO throughout construction phase.</li> <li>» Supervision of all clearing and earthworks.</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>

## OBJECTIVE C8: Protection of vegetation

There are no areas of *very high* local sensitivity on site. However, areas of high local ecological sensitivity have been identified. The development footprints will not impact on any botanical “no go” habitats or areas.

Impacts on vegetation at the construction stage are expected to be mainly as a result of direct permanent loss of vegetation in development footprint areas and in effect a loss of biodiversity. Fynbos vegetation communities should be considered as important in the construction of the project and the species of special concern, as listed in the Nature Conservation Ordinance for the province 1974 schedule 4 (*Gladiolus sp.*, *Erica sp.*, *Ixia orientalis*, *Leucodendron salignum*, *Leucospermum cuneiforme*, *Moraea inconspicua*, *Moraea tricuspida*, *Erica glumiflora*, *Watsonia sp.* and *Pelargonium reniforme*) should be avoided as far as possible. Permits will be required where Red Data or protected flora are to be disturbed or relocated.

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Access roads</li> <li>» Power line</li> <li>» Switching station</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Loss of populations of SSC (Species of special concern); loss of suitable habitat for SSC</li> <li>» Permanent loss of vegetation communities and alteration of habitat.</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Site preparation and earthworks</li> <li>» Construction-related traffic</li> <li>» Foundations or plant equipment installation</li> <li>» Mobile construction equipment</li> <li>» Power line construction activities</li> <li>» Dumping or damage by construction equipment outside of demarcated construction areas.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To retain natural vegetation in the high and moderate sensitive areas on the site</li> <li>» To minimise footprints of disturbance of vegetation/habitats on-site</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Areas to be cleared will be clearly marked in the field to eliminate unnecessary clearing.	Contractor in consultation with Specialist	Pre-construction
The extent of clearing and disturbance to the native vegetation must be kept to a minimum so that the	Contractor	Site establishment

Mitigation: Action/control	Responsibility	Timeframe
impact on flora is restricted.		& duration of contract
A site rehabilitation programme must be implemented.	Contractor in consultation with Specialist	Duration of contract
Limit unnecessary impacts on surrounding natural vegetation, e.g. driving around in the veld, use access roads only.	Contractor	Construction
Keep removal of vegetation and species of concern and trampling to a minimum.	Contractor	Construction
Ensure that construction and operation activities are kept within the demarcated areas.	Contractor CER	Construction
Where possible, align access routes and along existing roads and tracks.	Contractor	Construction
Where possible, reduce the amount of infrastructure in the fynbos community.	Contractor	Construction
Educate staff not to start any fires.	Contractor CER	Construction
SSC in any area to be cleared should be identified and rescued by a qualified horticulturalist. These species can be re-located to a nursery and used for rehabilitation where appropriate.	Contractor Specialist CER	Construction
Some species of special concern will not transplant. These individuals should, as far as possible, be avoided.	Contractor CER	Construction
Rehabilitate disturbed areas immediately after they are no longer being constructed on	Contractor	Construction
New roads should be sited in disturbed areas or the edges of disturbed areas wherever possible.	Contractor	Construction
Where possible, the positioning of infrastructure should be shifted to avoid populations of species of special concern.	Contractor	Construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No disturbance outside of designated work areas</li> <li>» Minimised clearing of existing/natural vegetation</li> <li>» Limited impacts on areas of identified and demarcated sensitive habitats/vegetation</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation of vegetation clearing activities by ECO/CER throughout construction phase</li> <li>» Supervision of all clearing and earthworks</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>



**OBJECTIVE C9: Limit damage to wetlands and watercourses**

There are two wetland areas within the power line corridor and the corridor crosses over the Krom River. Impacts on these sensitive ecological areas must be minimised.

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Power line</li> <li>» Access roads</li> </ul>
<b>Potential Impact</b>	Damage to the watercourse (such as erosion, siltation, dumping of waste within the wetland) that will impact on ecosystem functioning.
<b>Activity/risk source</b>	Construction activities close to these areas
<b>Mitigation: Target/Objective</b>	No damage to the wetlands and watercourses within the project area.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Where possible, power line structures should be placed outside of the wetland 500 m buffer area. Where this is not possible, infrastructure and access roads should be: <ul style="list-style-type: none"> <li>» Aligned with existing roads</li> <li>» Should go around wetlands where possible</li> <li>» Should cross watercourses perpendicularly to reduce the footprint</li> <li>» Infrastructure should not be placed within drainage lines</li> <li>» Disturbed areas should be rehabilitated immediately</li> <li>» Stormwater and runoff should be controlled</li> <li>» Adequate bridges and culvert structures should be provided at the crossings</li> </ul>	Contractor CER	Construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No disturbance outside of designated work areas</li> <li>» Minimised clearing of existing/natural vegetation</li> <li>» Limited impacts on areas of identified and demarcated sensitive habitats/vegetation</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» CER to monitor the habitat loss before and after construction</li> <li>» The wetlands should be monitored for the presence and development of erosion features downstream of any construction on site.</li> </ul>

**OBJECTIVE C10: Minimise the establishment and spread of alien invasive plants**

On-going alien plant monitoring and removal should be undertaken on all areas of natural vegetation on an annual basis.

<b>Project Component/s</b>	» Any infrastructure or activity that will result in disturbance to natural areas.
<b>Potential Impact</b>	» Invasion of natural vegetation surrounding the site by declared weeds or invasive alien species.
<b>Activities/Risk Sources</b>	» Construction, environmental management.
<b>Mitigation: Target/Objective</b>	» There is a target of no alien plants within project control area during the construction and operation phases.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Avoid creating conditions in which alien plants may become established: » Keep disturbance of indigenous vegetation to a minimum. » Rehabilitate disturbed areas as quickly as possible. » Do not import soil from areas with alien plants.	Contractor	Construction
Establish an on-going monitoring programme to detect and quantify any alien species that may become established and identify the problem species (as per Conservation of Agricultural Resources Act and Biodiversity Act).	Contractor	Construction
Immediately control any alien plants that become established using registered control methods.	Contractor	Construction

<b>Performance Indicator</b>	For each alien species: number of plants and aerial cover of plants within project area and immediate surroundings should be minimal.
<b>Monitoring</b>	» On-going monitoring of area by CER during construction. » Annual audit of project area and immediate surroundings by qualified botanist. » If any alien invasive species are detected then the distribution of these should be mapped (GPS co-ordinates of plants or concentrations of plants), number of individuals (whole site or per unit area), age and/or size classes of plants and aerial cover of plants. » The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the project area. » The environmental manager should be responsible for driving this process.

- » Reporting frequency depends on legal compliance framework.

### OBJECTIVE C11: Minimise soil degradation and erosion

Most of the study area appears to be underlain by unconsolidated sediments.

The soil on site may be impacted in terms of:

- » Soil degradation including erosion (by wind and water) and subsequent deposition elsewhere (i.e. into the drainage lines)
- » Uncontrolled run-off relating to construction activity (excessive wetting, uncontrolled discharge, etc.) will also lead to accelerated erosion and possible sedimentation of the drainage lines.
- » Degradation of the natural soil profile due to excavation, stockpiling, compaction, pollution and other construction activities will affect soil forming processes and associated ecosystems. Degradation of parent rock is considered low as there are no deep excavations envisaged.

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Power line.</li> <li>» Access roads.</li> <li>» Switching station.</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Soil and rock degradation.</li> <li>» Soil erosion.</li> <li>» Increased deposition of soil into drainage systems.</li> <li>» Increased run-off over the site.</li> </ul>
<b>Activities/Risk Sources</b>	<ul style="list-style-type: none"> <li>» Removal of vegetation, excavation, stockpiling, compaction, and pollution of soil.</li> <li>» Rainfall - water erosion of disturbed areas.</li> <li>» Wind erosion of disturbed areas.</li> <li>» Concentrated discharge of water from construction activity.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Minimise extent of disturbance areas.</li> <li>» Minimise activity within disturbance areas.</li> <li>» Minimise soil degradation (mixing, wetting, compaction, etc).</li> <li>» Minimise soil erosion.</li> <li>» Minimise deposition of soil into drainage lines.</li> <li>» Minimise instability of embankments/excavations.</li> </ul>

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Identify disturbance areas and restrict construction activity to these areas.	Contractor	Before and during construction

Mitigation: Action/Control	Responsibility	Timeframe
Rehabilitate disturbance areas as soon as practicable when construction in an area is complete.	Contractor	During and after construction
Access roads to be carefully planned and constructed to minimise the impacted area and prevent unnecessary excavation, placement, and compaction of soil.	Engineer and Contractor	Design and construction
Where access roads cross natural drainage lines, culverts must be designed to allow free flow and regular maintenance must be carried out.	Engineer and Contractor	Design, before and during construction
It may be necessary to use geotextiles and/or wind nets to limit wind erosion of exposed areas, where wind erosion could present difficulties and result in the loss of valuable topsoil.	Contractor	Site establishment & duration of contract
Minimise removal of vegetation which adds stability to soil.	Contractor	Construction
Soil conservation: Stockpile topsoil for re-use in rehabilitation phase, protect stockpile from erosion	Contractor	Construction
Erosion control measures (i.e. run-off attenuation on slopes (sand bags, logs), silt fences, storm water catch-pits, shade nets, or temporary mulching over denuded area as required).	Contractor	Construction
Control depth of excavations and stability of cut faces/sidewalls.	Engineer and Contractor	Construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No activity outside demarcated disturbance areas.</li> <li>» Acceptable level of activity within disturbance areas, as determined by the ECO.</li> <li>» Acceptable level of soil erosion around site, as determined by the ECO.</li> <li>» Acceptable level of increased siltation in drainage lines, as determined by the ECO.</li> <li>» Acceptable state of excavations, as determined by the ECO.</li> <li>» No activity in restricted areas.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Immediate reporting of ineffective erosion and sediment control systems.</li> <li>» An incident reporting system will record non-conformances.</li> </ul>

## OBJECTIVE C12: Protection of avifauna from collision and electrocution

During the operation, the threat of collision with the power line is the biggest potential threat to avifauna, particularly sensitive, collision prone species that

may occur in the study area. The threat of electrocution while perching on the power line and associated infrastructure serves as a threat to certain sensitive species, depending on the power line structures implemented. Therefore, appropriate measure are required to be implemented during construction to minimise this risk.

<b>Project Component/s</b>	Power line.
<b>Potential Impact</b>	Collision and electrocution events with the overhead power line during operation.
<b>Activities/Risk Sources</b>	Operation of the power line without appropriate mitigation measures.
<b>Mitigation: Target/Objective</b>	Maintain a low number of collision, and electrocution events.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Ensure bird-friendly tower designs are implemented to minimise the risk of electrocutions	Eskom Contractor	Construction
Fit bird flappers to new lines in identified sensitive areas	Eskom Contractor	Construction
Insulate live components at support structures.	Eskom Contractor	Construction

<b>Performance Indicator</b>	» Appropriate measures implemented in identified bird-sensitive areas
<b>Monitoring</b>	» Monitor power line servitude for mortalities.

### OBJECTIVE C13: Protection of heritage resources

The main cause of impacts to archaeological sites is physical disturbance of the material itself and its context. The heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. Excavations for foundations may archaeological sites, as will road construction activities.

The heritage study conducted for the proposed power line has revealed that both archaeological and paleontological material in the study area is sparse and does not constitute a major heritage concern. The placement of towers could impact however on unidentified sites of archaeological importance (early stone age tools).

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Power line.</li> <li>» Access roads.</li> <li>» Switching station</li> </ul>
<b>Potential Impact</b>	» Heritage objects/ artefacts/ Unidentified Sites/ Burial and Grave Sites ( found on site are inappropriately managed or destroyed
<b>Activity/Risk Source</b>	<ul style="list-style-type: none"> <li>» Site preparation and earthworks</li> <li>» Foundations or plant equipment installation</li> <li>» Mobile construction equipment movement on site</li> <li>» Power line and access roads construction activities.</li> </ul>
<b>Mitigation: Target/Objective</b>	» To ensure that any heritage objects found on site are treated appropriately and in accordance with the relevant legislation.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Areas required to be cleared during construction must be clearly marked in the field to avoid unnecessary disturbance of adjacent areas.	Contractor in consultation with Specialist	Pre-construction
Project employees and any contract staff must maintain, at all times, a high level of awareness of the possibility of discovering heritage sites. Familiarise all staff and contractors with procedures for dealing with heritage objects/sites.	Contractor	Duration of contract
If a heritage object is found i.e. grave/ burial site, or archaeological site, work in that area will be stopped immediately, and appropriate specialists brought in to assess to site, notify the administering authority of the item/site, and undertake due/required processes.	Contractor CER	Duration of contract
Apply for sampling permits from SAHRA for work on any archaeological sites identified as needing intervention.	Contractor	Pre-construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No disturbance outside of designated work areas.</li> <li>» All heritage items located are dealt with as per the legislative guidelines.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation of excavation activities by CER throughout construction phase.</li> <li>» Supervision of all clearing and earthworks.</li> <li>» Due care taken during earthworks and disturbance of land by all staff and any heritage objects found reported.</li> <li>» Appropriate permits obtained from SAHRA prior to the disturbance or destruction of heritage sites.</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>

## OBJECTIVE C14: Minimisation of visual impacts associated with construction

During the construction phase heavy vehicles, components, equipment and construction crews will frequent the area and may cause, at the very least, a cumulative visual nuisance to landowners and residents in the area as well as road users. The placement of lay-down areas and temporary construction camps should be carefully considered in order to not negatively influence the future perception of the project. Secondary visual impacts associated with the construction phase, such as the sight of construction vehicles, dust and construction litter must be managed to reduce visual impacts. The use of dust-suppression techniques on the access roads (where required), timely removal of rubble and litter, and the erection of temporary screening will assist in doing this.

<b>Project Component/s</b>	» Construction site.
<b>Potential Impact</b>	» Visual impact of general construction activities » Potential scarring of the landscape due to vegetation clearing.
<b>Activity/Risk Source</b>	» The viewing of the above mentioned by observers on or near the site.
<b>Mitigation: Target/Objective</b>	» Minimal visual intrusion by construction activities and construction accommodation and intact vegetation cover outside of immediate works areas.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Reduce the construction period through careful planning and productive implementation of resources.	Contractor	Planning
Plan the placement of lay-down areas in order to minimise vegetation clearing.	Contractor	Planning
Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.	Contractor	Construction
Ensure that good house-keeping practises are maintained, ensuring that rubble, litter, and disused construction materials are managed and removed regularly.	Contractor	Construction
Reduce and control construction dust using approved dust suppression techniques.	Contractor	Construction
As far as possible, restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.	Contractor	Construction
Rehabilitate all disturbed areas, construction areas,	Contractor	Construction

Mitigation: Action/Control	Responsibility	Timeframe
roads, and servitudes to acceptable visual standards.		

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Vegetation cover on and near the site is intact with no evidence of degradation or erosion.</li> <li>» Construction site is kept in a neat and tidy state.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Monitoring of vegetation clearing during construction.</li> <li>» Monitoring of rehabilitated areas post construction.</li> </ul>

### OBJECTIVE C15: Appropriate handling and management of waste

The main wastes expected will include general construction waste, hazardous waste (i.e. fuel), and liquid waste (including grey water and sewage).

In order to manage the wastes effectively, guidelines for the assessment, classification, and management of wastes, along with industry principles for minimising construction wastes must be implemented.

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Power line</li> <li>» Access road</li> <li>» Switching station</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Inefficient use of resources resulting in excessive waste generation.</li> <li>» Litter or contamination of the site or water through poor waste management practices.</li> </ul>
<b>Activity/Risk Source</b>	<ul style="list-style-type: none"> <li>» Packaging.</li> <li>» Other construction wastes.</li> <li>» Hydrocarbon use and storage.</li> <li>» Spoil material from excavation, earthworks, and site preparation.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To comply with waste management legislation.</li> <li>» To minimise production of waste.</li> <li>» To ensure appropriate waste storage and disposal.</li> <li>» To avoid environmental harm from waste disposal.</li> <li>» A waste manifests should be developed for the ablutions showing proof of disposal of sewage at appropriate water treatment works.</li> </ul>

Mitigation: Action/Control	Responsibility	Timeframe
Construction method and materials should be carefully considered in view of waste reduction, re-use, and	Contractor	Duration of contract



<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
recycling opportunities.		
Construction contractors must provide specific detailed waste management plans to deal with all waste streams.	Contractor	Duration of contract
Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste (wood and metal scrap), and contaminated waste as required. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage, and vermin control.	Contractor	Duration of contract
Where practically possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation, and storage of waste streams (such as wood, metals, general refuse etc.).	Contractor	Duration of contract
Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors.	Contractor	Duration of contract
Uncontaminated waste will be removed at least weekly for disposal; other wastes will be removed for recycling/disposal at an appropriate frequency.	Contractor	Duration of contract
Disposal of waste will be in accordance with relevant legislative requirements, including the use of licensed contractors.	Contractor	Duration of contract
Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area.	Contractor	Duration of contract
Waste must be kept to a minimum and must be transported by approved waste transporters to sites designated for their disposal.	Contractor	Duration of contract
Spilled cement will be cleaned up as soon as possible and disposed of at a suitably licensed waste disposal site.	Contractor	Duration of contract
Documentation (waste manifest) must be maintained detailing the quantity, nature, and fate of any regulated waste. Waste disposal records must be available for review at any time.	Contractor	Duration of contract
Regularly serviced chemical toilets facilities will be used to ensure appropriate control of sewage.	Contractor	Duration of contract
Upon the completion of construction, the area must be cleared of potentially polluting materials.	Contractor	Completion of construction
Dispose of all solid waste collected at an appropriately	Contractor	Duration of

Mitigation: Action/Control	Responsibility	Timeframe
registered waste disposal site. Waste disposal shall be in accordance with all relevant legislation and under no circumstances may waste be burnt on site.		construction
Where a registered waste site is not available close to the construction site, provide a method statement with regard to waste management.	Contractor	Duration of construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No complaints received regarding waste on site or indiscriminate dumping.</li> <li>» Internal site audits ensuring that waste segregation, recycling and reuse is occurring appropriately.</li> <li>» Provision of all appropriate waste manifests for all waste streams.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation and supervision of waste management practices throughout construction phase.</li> <li>» Waste collection will be monitored on a regular basis.</li> <li>» Waste documentation completed.</li> <li>» A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon.</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>

### OBJECTIVE C16: Appropriate handling and storage of chemicals, hazardous substances

The construction phase will involve the storage and handling of a variety of chemicals including adhesives, abrasives, oils and lubricants, paints and solvents.

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Storage and handling of chemicals, hazardous substances.</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Release of contaminated water from contact with spilled chemicals.</li> <li>» Generation of contaminated wastes from used chemical containers.</li> </ul>
<b>Activity/Risk Source</b>	<ul style="list-style-type: none"> <li>» Vehicles associated with site preparation and earthworks.</li> <li>» Construction activities of area and linear infrastructure.</li> <li>» Hydrocarbon use and storage.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To ensure that the storage and handling of chemicals and hydrocarbons on-site does not cause pollution to the environment or harm to persons.</li> </ul>

- » To ensure that the storage and maintenance of machinery on-site does not cause pollution of the environment or harm to persons.

Mitigation: Action/Control	Responsibility	Timeframe
Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants.	Contractor	Duration of contract
Corrective action must be undertaken immediately if a potential/actual leak or spill of a polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures.	Contractor	Duration of contract
In the event of a major spill or leak of contaminants, the relevant administering authority must be immediately notified as per the notification of emergencies/incidents.	Contractor	Duration of contract
Spilled cement must be cleaned up as soon as possible and disposed of at a suitably licensed waste disposal site.	Contractor	Duration of contract
Any contaminated/polluted soil removed from the site must be disposed of at a licensed hazardous waste disposal facility.	Contractor	Duration of contract
Routine servicing and maintenance of vehicles must not to take place on-site (except for emergencies). If repairs of vehicles must take place, an appropriate drip tray must be used to contain any fuel or oils.	Contractor	Duration of contract
All stored fuels to be maintained within a bund and on a sealed surface.	Contractor	Duration of contract
Fuel storage areas must be inspected regularly to ensure bund stability, integrity, and function.	Contractor	Duration of contract
Construction machinery must be stored in an appropriately sealed area.	Contractor	Duration of contract
The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately banded, and stored in compliance with Material Safety Data Sheets (MSDS) files.	Contractor	Duration of contract
Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be compiled with.	Contractor	Duration of contract
Transport of all hazardous substances must be in accordance with the relevant legislation and regulations	Contractor	Duration of contract
The sediment control and water quality structures used on-site must be monitored and maintained in an	Contractor	Duration of contract

Mitigation: Action/Control	Responsibility	Timeframe
operational state at all times.		
Upon the completion of construction, the area must be cleared of potentially polluting materials.	Contractor	Completion of construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No chemical spills outside of designated storage areas.</li> <li>» No unattended water or soil contamination by spills.</li> <li>» No complaints received regarding waste on site or indiscriminate dumping.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation and supervision of chemical storage and handling practices and vehicle maintenance throughout construction phase.</li> <li>» A complaints register must be maintained, in which any complaints from the community will be logged.</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>

### OBJECTIVE C17: Noise control

Traffic movement to and from the site, particularly of heavy-duty vehicles during construction, could potentially result in a noise impact on the residents adjacent to the R45 near the site.

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Power line</li> <li>» Access roads</li> <li>» Switching station</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Nuisance noise from construction affecting the surrounding community</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Site preparation and earthworks</li> <li>» Construction-related transport</li> <li>» Foundations or plant equipment installation</li> <li>» Power line construction activities</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To minimise noise to any surrounding residences from the construction activities</li> <li>» To comply with Noise Control Regulations and SANS Guidelines</li> <li>» To ensure noise levels are acceptable at residences in close proximity to construction activities</li> </ul>

Mitigation: Action/control	Responsibility	Timeframe
On-site construction activities will be limited to 6:00am	Contractor	Duration of

Mitigation: Action/control	Responsibility	Timeframe
to 6:00pm Monday – Saturday (excluding public holidays) (in terms of the Environment Conservation Act). Should construction activities need to be undertaken outside of these times, the surrounding communities will be notified and appropriate approval must be obtained from DEA and/or the Local Authority.		contract
Construction noise will be managed according to the Noise Control Regulations and SANS 10103.	Contractor	Duration of contract
All construction equipment, including vehicles, will be properly and appropriately maintained in order to minimise noise generation.	Contractor	Duration of contract

<b>Performance Indicator</b>	» No complaints received concerning noise
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon.</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>

### 6.3 Detailing Method Statements

**OBJECTIVE C18: Ensure all construction activities are undertaken with the appropriate level of environmental awareness to minimise environmental risk**

The environmental specifications are required to be underpinned by a series of Method Statements, within which the Contractors and Service Providers are required to outline how any identified environmental risks will practically be mitigated and managed for the duration of the contract, and how specifications within this EMP will be met. That is, the Contractor will be required to describe how specified requirements will be achieved through the submission of written Method Statements to the Site Manager and ECO.

A Method Statement is defined as “a written submission by the Contractor in response to the environmental specification or a request by the Site Manager, setting out the plant, materials, labour and method the Contractor proposes using to conduct an activity, in such detail that the Site Manager is able to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications”. The Method Statement must cover applicable details with regard to:

- » Construction procedures;
- » Materials and equipment to be used;
- » Getting the equipment to and from site;
- » How the equipment/material will be moved while on-site;
- » How and where material will be stored;
- » The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- » Timing and location of activities;
- » Compliance/non-compliance with the Specifications; and
- » Any other information deemed necessary by the Site Manager.

Specific method statements required may include:

- » Site establishment (which explains all activities from induction training to offloading, construction sequence for site establishment and the different amenities and to be established etc. Including a site camp plan indicating all of these).
- » Preparation of the site (i.e. Clearing vegetation, compacting soils and removing existing infrastructure and waste).
- » Soil management/stockpiling and erosion control.
- » Excavations and backfilling procedure.
- » Stipulate norms and standards for water supply and usage (i.e.: comply strictly to licence and legislation requirements and restrictions)
- » Stipulate the storm water management procedures recommended in the storm water management method statement.
- » Ablution facilities (placement, maintenance, management and servicing)
- » Solid Waste Management:
  - \* Description of the waste storage facilities (on site and accumulative).
  - \* Placement of waste stored (on site and accumulative).
  - \* Management and collection of waste process.
  - \* Recycle, re-use and removal process and procedure.
- » Liquid waste management:
  - \* The design, establish, maintain and operate suitable pollution control facilities necessary to prevent discharge of water containing polluting matter or visible suspended materials into rivers, streams or existing drainage systems.
  - \* Should grey water (i.e. water from basins, showers, baths, kitchen sinks etc.) need to be disposed of, link into an existing facilities where possible. Where no facilities are available, grey water runoff must be controlled to ensure there is no seepage into wetlands or natural watercourses.
- » Dust and noise pollution

- \* Describe necessary measures to ensure that noise from construction activities is maintained within lawfully acceptable levels (construction activities generating output levels of 85 dB(A) near human settlement, are to be confined to working hours (06h00 - 18h00) Mondays to Fridays).
- \* Procedure to control dust at all times on the site, access roads, borrow pits and spoil sites (dust control shall be sufficient so as not to have significant impacts in terms of the biophysical and social environments). These impacts include visual pollution, decreased safety due to reduced visibility, negative effects on human health and the ecology due to dust particle accumulation.
- » Hazardous substance storage (Ensure compliance with all national, regional and local legislation with regard to the storage of oils, fuels, lubricants, solvents, wood treatments, bitumen, cement, pesticides and any other harmful and hazardous substances and materials. South African National Standards apply).
  - \* Lists of all potentially hazardous substances to be used.
  - \* Appropriate handling, storage and disposal procedures.
  - \* Prevention protocol of accidental contamination of soil at storage and handling areas.
  - \* All storage areas, (ie: for harmful substances appropriately banded with a suitable collection point for accidental spills must be implemented and drip trays underneath dispensing mechanisms including leaking engines/machinery).
- » Fire prevention and management measures on site.
- » Fauna and flora protection process on and off site (ie removal to reintroduction or replanting, if necessary).
  - \* Rehabilitation and re-vegetation process.
- » Incident and accident reporting protocol.
- » General administration
- » Designate access road and the protocol on while roads are in use.
- » Requirements on gate control protocols.

The Contractor may not commence the activity covered by the Method Statement until it has been approved by the Site Manager, except in the case of emergency activities and then only with the consent of the Site Manager. Approval of the Method Statement will not absolve the Contractor from their obligations or responsibilities in terms of their contract.

Failure to submit a method statement may result in suspension of the activity concerned until such time as a method statement has been submitted and approved. The ECO should monitor the construction activities to ensure that these are undertaken in accordance with the approved Method Statement.

#### 6.4 Awareness and Competence: Construction Phase

**OBJECTIVE C19: To ensure all construction personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm**

To achieve effective environmental management, it is important that Contractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMP. The Contractor is responsible for informing employees and sub-contractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts.

The Contractors obligations in this regard include the following:

- » Employees must have a basic understanding of the key environmental features of the construction site and the surrounding environment.
- » Ensuring that a copy of the EMP is readily available on-site, and that all site staff are aware of the location and have access to the document.
- » Employees will be familiar with the requirements of the EMP and the environmental specifications as they apply to the construction of the power line.
- » Ensuring that, prior to commencing any site works, all employees and sub-contractors have attended an Environmental Awareness Training course.
- » The course should be sufficient to provide the site staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
- » Awareness of any other environmental matters, which are deemed necessary by the ECO.
- » Ensuring that employee information posters, outlining the environmental "do's" and "don'ts" (as per the environmental awareness training course) are erected at prominent locations throughout the site.
- » Ensure that construction workers have received basic training in environmental management, including the storage and handling of hazardous substances, minimisation of disturbance to sensitive areas, management of waste, and prevention of water pollution.
- » Records must be kept of those that have completed the relevant training.
- » Training should be done either in a written or verbal format but must be appropriate for the receiving audience.
- » Refresher sessions must be held to ensure the contractor staff are aware of their environmental obligations as practically possible, detailed below.



#### ***6.4.1 Environmental Awareness Training***

Environmental Awareness Training must take the form of an on-site talk and demonstration by the ECO before the commencement of site establishment and construction on site. The education/awareness programme should be aimed at all levels of management and construction workers within the contractor team. A record of attendance of this training must be maintained by the ECO on site.

#### ***6.4.2 Induction Training***

Environmental induction training must be presented to all persons who are to work on the site – be it for short or long durations; Contractor's or Engineer's staff; administrative or site staff; sub-contractors or visitors to site.

This induction training should include discussing the developer's environmental policy and values, the function of the EMP and Contract Specifications and the importance and reasons for compliance to these. The induction training must highlight overall do's and don'ts on site and clarify the repercussions of not complying with these. The non-conformance reporting system must be explained during the induction as well. Opportunity for questions and clarifications must form part of this training. A record of attendance of this training must be maintained by the SHE Officer on site.

#### ***6.4.3 Toolbox Talks***

Toolbox talks should be held on a scheduled and regular basis (at least twice a month) where foremen, environmental and safety representatives of different components of the Works and sub-consultants hold talks relating to environmental practices and safety awareness on site. These talks should also include discussions on possible common incidents occurring on site and the prevention of reoccurrence thereof. Records of attendance and the awareness talk subject must be kept on file.

## 6.5 Monitoring Programme: Construction Phase

### **OBJECTIVE C20: To monitor the performance of the control strategies employed against environmental objectives and standards**

A monitoring programme must be in place not only to ensure conformance with the EMP, but also to monitor any environmental issues and impacts which have not been accounted for in the EMP that are, or could result in significant environmental impacts for which corrective action is required. The period and frequency of monitoring will be stipulated by the Environmental Authorisation (once issued). The Project Manager will ensure that the monitoring is conducted and reported.

The aim of the monitoring and auditing process would be to monitor the implementation of the specified environmental specifications, in order to:

- » Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications.
- » Ensure adequate and appropriate interventions to address non-compliance.
- » Ensure adequate and appropriate interventions to address environmental degradation.
- » Provide a mechanism for the lodging and resolution of public complaints.
- » Ensure appropriate and adequate record keeping related to environmental compliance.

An independent Environmental Control Officer (ECO) must be appointed, and must have the appropriate experience and qualifications to undertake the necessary tasks. The ECO will ensure compliance with the environmental authorisation (once issued), EMP, relevant permits and licences and the environmental legislation during construction, and will conduct monitoring activities on a regular basis. The ECO will report any non-compliance or where corrective action is necessary to the Site Manager, DEA and/or any other monitoring body stipulated by the regulating authorities.

The ECO shall remain on site on a full-time basis as long as construction activities dictate. Thereafter provided compliance is maintained, monthly or bi-weekly site compliance inspections would be sufficient, reducing as construction proceeds. However, in the absence of the ECO there should be a designated environmental officer present to deal with any environmental issues that may arise such as fuel or oil spills.

### ***6.5.1. Non-Conformance Reports***

All supervisory staff including Foremen, Resident Engineers, and the ECO must be provided the means to be able to submit non-conformance reports to the Site Manager. Non-conformance reports will describe, in detail, the cause, nature and effects of any environmental non-conformance by the Contractor. Records of penalties imposed may be required by the relevant authority within 48 (forty eight) hours.

The non-conformance report will be updated on completion of the corrective measures indicated on the finding sheet. The report must indicate that the remediation measures have been implemented timeously and that the non-conformance can be closed-out to the satisfaction of the Site Manager and ECO.

### ***6.5.2. Monitoring Reports***

A monitoring report will be compiled by the ECO on a monthly basis and must be submitted to DEA for their records. This report should include details of the activities undertaken in the reporting period, any non-conformances or incidents recorded, corrective action required, and details of those non-conformances or incidents which have been closed out.

### ***6.5.3. Final Audit Report***

A final environmental audit report must be compiled by an independent auditor and be submitted to DEA upon completion of the construction and rehabilitation activities (within 30 days of completion of the construction phase (i.e.: within 30 days of site handover)) and within 30 days of completion of rehabilitation activities. This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions and the requirements of the EMP.

**MANAGEMENT PROGRAMME: REHABILITATION**

**CHAPTER 7**

**Overall Goal:** Undertake the rehabilitation measures in a way that:

- » Ensures rehabilitation of disturbed areas following the execution of the works, such that residual environmental impacts are remediated or curtailed.

**7.1. Objectives**

In order to meet this goal, the following objective, actions and monitoring requirements are relevant:

**OBJECTIVE R1: Ensure appropriate rehabilitation of disturbed areas such that residual environmental impacts are remediated or curtailed**

Areas requiring rehabilitation will include all areas disturbed during the construction phase and that are not required for regular operation and maintenance operations. Rehabilitation should be undertaken in an area as soon as possible after the completion of construction activities within that area.

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Power line</li> <li>» Access roads</li> <li>» Switching station</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Environmental integrity of site undermined resulting in reduced visual aesthetics, erosion and increased runoff, and the requirement for on-going management intervention.</li> </ul>
<b>Activity/Risk Source</b>	<ul style="list-style-type: none"> <li>» Temporary construction areas.</li> <li>» Temporary access roads/tracks.</li> <li>» Power line servitudes.</li> <li>» Other disturbed areas/footprints.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Ensure and encourage site rehabilitation of disturbed areas.</li> <li>» Ensure that the site is appropriately rehabilitated following the execution of the works, such that residual environmental impacts (including erosion) are remediated or curtailed.</li> </ul>

Mitigation: Action/Control	Responsibility	Timeframe
All temporary facilities, equipment, and waste materials must be removed from site.	Contractor	Following execution of the works
All temporary fencing and danger tape must be	Contractor	Following

Mitigation: Action/Control	Responsibility	Timeframe
removed once the construction phase has been completed.		completion of construction activities in an area
The area that previously housed the construction equipment camp is to be checked for spills of substances such as oil, paint, etc. and these should be cleaned up.	Contractor	Following completion of construction activities in an area
All hardened surfaces within the construction equipment camp area should be ripped, all imported materials removed, and the area shall be top soiled and re-vegetated.	Contractor	Following completion of construction activities in an area
Temporary roads must be closed and access across these blocked.	Contractor	Following completion of construction activities in an area
Necessary drainage works and anti-erosion measures must be installed, where required, to minimise loss of topsoil and control erosion.	Contractor	Following completion of construction activities in an area
A rehabilitation plan should be drawn up that specifies the rehabilitation process.	Contractor	Pre-construction
Where disturbed areas are not to be used during the construction of the proposed power line, these areas must be rehabilitated/re-vegetated with appropriate natural vegetation and/or local seed mix. Re-use of native/indigenous plant species removed from disturbance areas in the rehabilitation phase to be determined by a botanist, as applicable.	Contractor in consultation with rehabilitation specialist	Following completion of construction activities in an area
Re-vegetated areas may have to be protected from wind erosion and maintained until an acceptable plant cover has been achieved.	Eskom	Post-rehabilitation
Erosion control measures should be used in sensitive areas such as areas with steep slopes.	Contractor	Rehabilitation
On-going alien plant monitoring and removal must be undertaken on all areas of natural vegetation on an annual basis.	Eskom	Post-rehabilitation

**Performance Indicator**

- » All portions of site, including construction equipment camp and working areas, cleared of equipment and temporary facilities.

	<ul style="list-style-type: none"><li>» Topsoil replaced on all areas and stabilised where practicable or required after construction and temporally utilised areas.</li><li>» Disturbed areas rehabilitated and acceptable plant cover achieved on rehabilitated sites.</li><li>» Completed site free of erosion and alien invasive plants.</li></ul>
<b>Monitoring</b>	<ul style="list-style-type: none"><li>» On-going inspection of rehabilitated areas in order to determine effectiveness of rehabilitation measures implemented.</li><li>» On-going alien plant monitoring and removal should be undertaken on an annual basis.</li></ul>

**MANAGEMENT PROGRAMME: OPERATION**

**CHAPTER 8**

**Overall Goal:** To ensure that the operation of the power line does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action taken in all cases. In order to address this goal, it is necessary to operate the line in a way that:

- » Ensures that operation activities are properly managed in respect of environmental aspects and impacts.
- » Enables the operation activities to be undertaken without significant disruption to other land uses in the area, in particular with regard to farming practices, traffic and road use, and effects on local residents.

An environmental manager must ensure the implementation of the operational EMP.

**8.1. Objectives**

In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

**OBJECTIVE O1: Protection of indigenous natural vegetation, fauna and maintenance of rehabilitation**

Indirect impacts on vegetation and fauna during operation could result from maintenance activities and the movement of people and vehicles on site and in the surrounding area. In order to ensure the long-term environmental integrity of the site following construction, maintenance of the areas rehabilitated post-construction must be undertaken until these areas have successfully re-established.

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Service road utilised during regular maintenance.</li> <li>» Areas disturbed during the construction phase and subsequently rehabilitation at its completion.</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Disturbance to or loss of vegetation and/or habitat.</li> </ul>
<b>Activity/Risk Source</b>	<ul style="list-style-type: none"> <li>» Movement of employee vehicles within and around site.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Maintain minimised footprints of disturbance of vegetation/habitats on-site.</li> <li>» Ensure and encourage plant regrowth in non-operational areas</li> </ul>

of post-construction rehabilitation.

Mitigation: Action/Control	Responsibility	Timeframe
Vehicle movements must be restricted to designated roadways.	Eskom	Operation
No disturbance of vegetation outside of the project site must occur.	Eskom	Operation
Existing roads must be maintained to ensure limited erosion and impact on areas adjacent to roadways.	Eskom	Operation
An on-going alien plant monitoring and eradication programme must be implemented, where necessary.	Eskom	Operation

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No further disturbance to vegetation or terrestrial faunal habitats.</li> <li>» Continued improvement of rehabilitation efforts.</li> <li>» No disturbance of vegetation outside of project site.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Regular inspections to monitor plant regrowth/performance of rehabilitation efforts and weed infestation compared to natural/undisturbed areas.</li> </ul>

## OBJECTIVE O2: Protection of avifauna from collision and electrocution

During the operation, the threat of collision with the power line is the biggest potential threat to avifauna, particularly sensitive, collision prone species that may occur in the study area. The threat of electrocution while perching on the power line and associated infrastructure serves as a threat to certain sensitive species, depending on the power line structures implemented.

<b>Project Component/s</b>	Power line.
<b>Potential Impact</b>	Collision and electrocution events with the overhead power line.
<b>Activities/Risk Sources</b>	Operation of the power line without appropriate mitigation measures.
<b>Mitigation: Target/Objective</b>	Maintain a low number of collision, and electrocution events.



Mitigation: Action/Control	Responsibility	Timeframe
Maintain bird flappers to new lines in identified sensitive areas	Eskom	Operation
Maintain insulation of live components at support structures.	Eskom	Operation

<b>Performance Indicator</b>	» Minimal collision or electrocution events.
<b>Monitoring</b>	» Observation of electrocution or collision events with the power line. » Monitor power line servitude for mortalities.

### OBJECTIVE O3: Minimise soil degradation and erosion

The soil on site may be impacted in terms of:

- » Soil degradation including erosion (by wind and water) and subsequent deposition elsewhere is of a concern across the entire site which is underlain by fine grained soil which can be mobilised when disturbed, even on relatively low slope gradients (accelerated erosion).
- » Uncontrolled run-off relating to construction activity (excessive wetting, uncontrolled discharge, etc.) will also lead to accelerated erosion and possible sedimentation of drainage systems.
- » Degradation of the natural soil profile due to pollution.

<b>Project Component/s</b>	» Power line. » Access roads. » Switching station
<b>Potential Impact</b>	» Soil degradation. » Soil erosion. » Increased deposition of soil into drainage systems. » Increased run-off over the site.
<b>Activities/Risk Sources</b>	» Poor rehabilitation of cleared areas. » Rainfall - water erosion of disturbed areas. » Wind erosion of disturbed areas. » Concentrated discharge of water from construction activity.
<b>Mitigation: Target/Objective</b>	» Ensure rehabilitation of disturbed areas is maintained. » Minimise soil erosion and deposition of soil into drainage lines. » Ensure continued stability of embankments/excavations.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Rehabilitate disturbance areas should the previous attempt be unsuccessful.	Eskom	Operation
Maintain erosion control measures implemented during the construction phase (i.e. run-off attenuation on slopes (sand bags, logs), silt fences, storm water catch-pits, and shade nets).	Eskom	Operation

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Acceptable level of soil erosion around site, as determined by the site manager.</li> <li>» Acceptable level of increased siltation in drainage lines, as determined by the site manager.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Inspections of site on a bi-annual basis.</li> </ul>

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## **MANAGEMENT PROGRAMME: DECOMMISSIONING**

## **CHAPTER 9**

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It is most likely that decommissioning activities of the infrastructure would comprise the disassembly and replacement of the power line infrastructure with more appropriate technology/infrastructure available at that time.

The section on Rehabilitation (chapter 7) is also relevant to the decommissioning of sections of the proposed distribution line and must be adhered to.

The relevant mitigation measures contained under the construction section should be applied during decommissioning and therefore is not repeated in this section. It must be noted that decommissioning activities will need to be undertaken in accordance with the legislation applicable at that time, which may require this section of the EMP to be revisited and amended.

### **9.1. Site Preparation**

Site preparation activities will include confirming the integrity of the access to the site to accommodate required equipment, preparation of the site (e.g. lay down areas, construction platform) and the mobilisation of construction equipment.

### **9.2 Disassemble and Remove Infrastructure**

Disassembled components will be reused, recycled, or disposed of in accordance with regulatory requirements.

**APPENDIX A:  
GRIEVANCE MECHANISM**

## **GRIEVANCE MECHANISM / PROCESS**

### **AIM**

The aim of the grievance mechanism is to ensure that grievances / concerns raised by local landowners and or communities are addressed in a manner that is:

- Fair and equitable;
- Open and transparent;
- Accountable and efficient.

It should be noted that the grievance mechanism does not replace the right of an individual, community, group or organization to take legal action should they so wish. However, the aim should be to address grievances in a manner that does not require a potentially costly and time consuming legal process.

### **Proposed generic grievance process**

- Local landowners, communities and authorities will be informed in writing by the proponent (the renewable energy company) of the grievance mechanism and the process by which grievances can be brought to the attention of the proponent.
- A company representative will be appointed as the contact person for grievances to be addressed to. The name and contact details of the contact person will be provided to local landowners, communities and authorities.
- Project related grievances relating to the construction, operational and or decommissioning phase must be addressed in writing to the contact person. The contact person should assist local landowners and or communities who may lack resources to submit/prepare written grievances.
- The grievance will be registered with the contact person who, within 2 working days of receipt of the grievance, will contact the Complainant to discuss the grievance and agree on suitable date and venue for a meeting. Unless otherwise agreed, the meeting will be held within 2 weeks of receipt of the grievance.
- The contact person will draft a letter to be sent to the Complainant acknowledging receipt of the grievance, the name and contact details of Complainant, the nature of the grievance, the date that the grievance was raised, and the date and venue for the meeting.
- Prior to the meeting being held the contact person will contact the Complainant to discuss and agree on who should attend the meeting. The people who will be required to attend the meeting will depend on the nature of the grievance. While the Complainant and or proponent are entitled to invite their legal representatives to attend the meeting/s, it should be made clear that to all the parties involved in the process that the grievance mechanism

process is not a legal process. It is therefore recommended that the involvement of legal representatives be limited.

- The meeting will be chaired by the company representative appointed to address grievances. The proponent will provide a person to take minutes of and record the meeting/s. The costs associated with hiring venues will be covered by the proponent. The proponent will also cover travel costs incurred by the Complainant, specifically in the case of local, resource poor communities.
- Draft copies of the minutes will be made available to the Complainant and the proponent within 4 working days of the meeting being held. Unless otherwise agreed, comments on the Draft Minutes must be forwarded to the company representative appointed to manage the grievance mechanism within 4 working days of receipt of the draft minutes.
- In the event of the grievance being resolved to the satisfaction of all the parties concerned, the outcome will be recorded and signed off by the relevant parties. The record should provide details of the date of the meeting/s, the names of the people that attended the meeting/s, the outcome of the meeting/s, and where relevant, the measures identified to address the grievance, the party responsible for implementing the required measures, and the agreed upon timeframes for the measures to be implemented.
- In the event of a dispute between the Complainant and the proponent regarding the grievance, the option of appointing an independent mediator to assist with resolving the issue should be discussed. The record of the meeting/s will note that a dispute has arisen and that the grievance has not been resolved to the satisfaction of all the parties concerned;
- In the event that the parties agree to appoint a mediator, the proponent will be required to identify three (3) mediators and forward the names and CVs to the Complainant within 2 weeks of the dispute being declared. The Complainant, in consultation with the proponent, will identify the preferred mediator and agree on a date for the next meeting. The cost of the mediator will be borne by the proponent. The proponent will provide a person to take minutes of and record the meeting/s.
- In the event of the grievance, with the assistance of the mediator, being resolved to the satisfaction of all the parties concerned, the outcome will be recorded and signed off by the relevant parties, including the mediator. The record should provide details on the date of the meeting/s, the names of the people that attended the meeting/s, the outcome of the meeting/s, and where relevant, the measures identified to address the grievance, the party responsible for implementing the required measures, and the agreed upon timeframes for the measures to be implemented.
- In the event of the dispute not being resolved, the mediator will prepare a draft report that summarises the nature of the grievance and the dispute. The report should include a recommendation by the mediator on the proposed way forward with regard to the addressing the grievance.

- The draft report will be made available to the Complainant and the proponent for comment before being finalised and signed by all parties. Unless otherwise agreed, comments on the draft report must be forwarded to the company representative appointed to manage the grievance mechanism within 4 working days.

The way forward will be informed by the recommendations of the mediator and the nature of the grievance. As indicated above, the grievance mechanism does not replace the right of an individual, community, group or organization to take legal action should they so wish. In the event of the grievance not being resolved to the satisfaction of Complainant and or the proponent, either party may be of the opinion that legal action may be the most appropriate option.