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# DEVIATION OF THE EXISTING 132KV DASSENBERG-KOEBERG POWER LINE FROM THE KOEBERG POWER STATION INTO THE ANKERLIG POWER STATION, WESTERN CAPE PROVINCE

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## CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

DEA Reference Number 14/12/16/3/3/1/1182

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## PROJECT DETAILS

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**DEA Reference No.** : 14/12/16/3/3/1/1182

**Title** : Environmental Assessment Process  
Construction Environmental Management Programme: Deviation of the Existing 132kV Dassenberg-Koeberg Power Line from the Koeberg Power Station into the Ankerlig Power Station, Western Cape Province

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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.

**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.

**'Do nothing' alternative:** The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

**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:** As per the NEM:WA Amendment Bill, Waste can be defined as

- (a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or
- (b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste—
  - (i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;
  - (ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;
  - (iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or
  - (iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste

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## CHAPTER 1: PROJECT DETAILS

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Eskom Holdings SOC Limited obtained authorisation for the relocation of the turbine units at Acacia Power Station to Ankerlig Power Station in February 2009. These units provide a dedicated off-site power supply to the Koeberg Power Station in terms of the requirements of the National Nuclear Regulator (NNR). As part of this authorisation, a 132kV power line between Ankerlig Power Station and Koeberg Power Station was authorised. During the detailed planning process, and through discussions with the NNR, it has been determined that the authorised power line route is no longer technically viable as the NNR requires that the power line for the dedicated off-site supply to Koeberg is not crossed by any other power line so as to reduce any risks to this power line's normal operation. As the routing of the authorised power line between Ankerlig and Koeberg crosses a number of 400kV power lines, Eskom is proposing to reroute a portion (~5km of the 15km route) of this power line in order to avoid these power line crossings. The deviation of the power line will be undertaken on the northern portion of the line in close proximity to the Ankerlig Power Station. The deviated portion of the line will be connected to a new 132kV HV yard within the Ankerlig Power Station boundary. After deviation of the power line, the existing portion of the Dassenberg-Koeberg power line which will no longer be required will be delinked and decommissioned.

The project will include the following:

- » The deviation of approximately 5km of the northern section of the existing 132kV Dassenberg-Koeberg power line.
- » Developing access roads along the servitude where required for construction and operational purposes.
- » Decommissioning of a portion of the Dassenberg-Koeberg power line.

A number of alternatives were considered by Eskom in determining the proposed routing of the deviation:

1. Alternative 1: A power line running north from the substation, crossing the R307 and then turning southwards to link with the existing power line;
2. Alternative 2: A power line running north from the substation, parallel to the Ankerlig power station boundary to the south of the R307 road, turning southwards and linking into the existing Koeberg-Ankerlig 132kV power line;
3. A power line running north from the substation, parallel to the Ankerlig power station boundary to the south of the R307 road, and then down the

eastern boundary of the Ankerlig Power Station towards Neil Hare road next to the railway line and then following the same route as for Alternative 2.

4. Alternative 4: An underground cable at the 400kV transmission lines crossing.

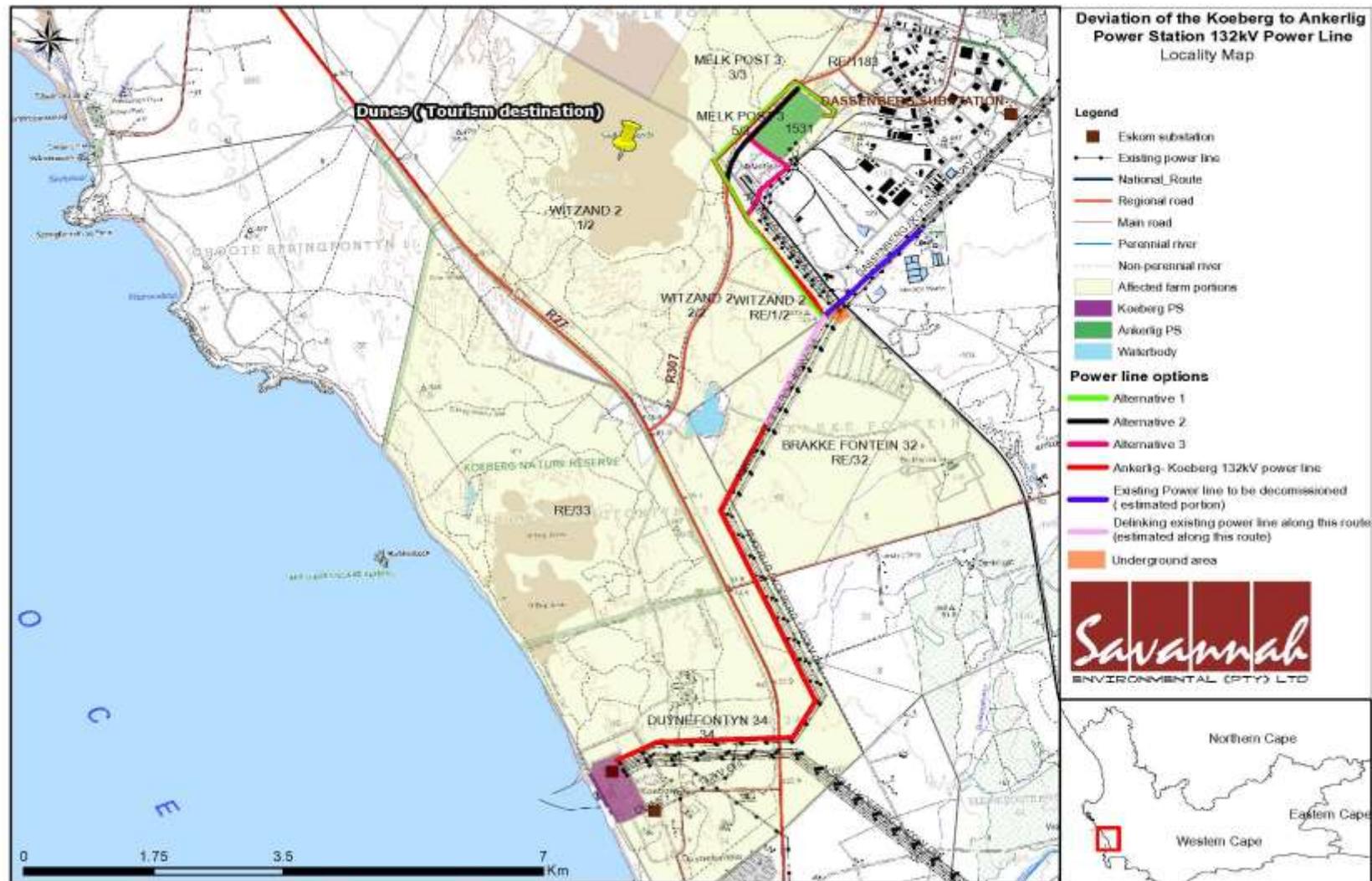
Alternatives 3 and 4 above were determined to be non-feasible from a technical perspective for the following reasons:

- » Alternative 3 - Due to the stress on the towers it is not possible to have angles of more than 60 degrees at bend points. This alternative will require bends of 90 degrees at the road intersections, which will not be possible. In addition, construction of the power line on the eastern boundary of the Ankerlig power station would limit potential future expansion opportunities for the power station, which is not considered desirable.
- » Alternative 4 - underground cabling is not considered feasible due to issues relating to the reliability of the lines and the time taken to repair a fault. The time allowed, by the National Nuclear Regulator (NNR) for the off-site supply to be out of service without Koeberg having to shut down is 3 days per 12 month window. Using cable increases the duration of repair times and would increase the risk of exceeding the 3 day limit which could result in Koeberg being shut down. This option places the nuclear license of Koeberg at risk and is therefore not considered feasible.

Therefore, only Alternatives 1 and 2 above and the no go option are considered within this Basic Assessment Report. A power line corridor of 300m is considered for each alternative within which the 36m wide servitude could be located.

The following properties will be affected by the construction of the proposed power line (refer to Figure 1):

- » Portion 2 of Farm Witzand
- » Re1 /2 of Farm Witzand
- » Portion 1 of Farm Witzand
- » Portion 3 of Farm Melk Post
- » Portion 5 of Farm Melk Post
- » Brakke Fontein 32
- » Farm 33
- » Farm 1183
- » Farm 1531



**Figure 1:** Locality map of the proposed deviation of the Dassenberg-Koeberg power line from the Ankerlig Power Station to the Koeberg Power Station, Western Cape Province.

Eskom received Environmental Authorisation for the project in August 2015. In terms of the Environmental Authorisation, Alternative 2 is authorised as the preferred alternative for implementation (refer to Appendix A). Proposed tower positions are indicated in Table 1.1 and within Appendix B.

<b><u>Structure number</u></b>	<b><u>Longitude</u></b>	<b><u>Latitude</u></b>
<u>1</u>	<u>18°28'03.837"</u>	<u>33°35'21.729"</u>
<u>2</u>	<u>18°28'05.200"</u>	<u>33°35'20.430"</u>
<u>3</u>	<u>18°28'01.147"</u>	<u>33°35'17.384"</u>
<u>4</u>	<u>18°27'56.710"</u>	<u>33°35'14.050"</u>
<u>5</u>	<u>18°27'51.889"</u>	<u>33°35'10.428"</u>
<u>6</u>	<u>18°27'49.730"</u>	<u>33°35'09.820"</u>
<u>7</u>	<u>18°27'44.291"</u>	<u>33°35'14.623"</u>
<u>8</u>	<u>18°27'38.203"</u>	<u>33°35'19.999"</u>
<u>9</u>	<u>18°27'31.495"</u>	<u>33°35'25.921"</u>
<u>10</u>	<u>18°27'26.052"</u>	<u>33°35'30.727"</u>
<u>11</u>	<u>18°27'22.698"</u>	<u>33°35'35.773"</u>
<u>12</u>	<u>18°27'19.695"</u>	<u>33°35'40.290"</u>
<u>13</u>	<u>18°27'16.267"</u>	<u>33°35'45.446"</u>
<u>14</u>	<u>18°27'13.080"</u>	<u>33°35'50.240"</u>
<u>15</u>	<u>18°27'16.110"</u>	<u>33°35'57.688"</u>
<u>16</u>	<u>18°27'18.374"</u>	<u>33°36'03.253"</u>
<u>17</u>	<u>18°27'21.359"</u>	<u>33°36'10.592"</u>
<u>18</u>	<u>18°27'25.175"</u>	<u>33°36'15.238"</u>
<u>19</u>	<u>18°27'28.944"</u>	<u>33°36'19.826"</u>
<u>20</u>	<u>18°27'34.283"</u>	<u>33°36'26.326"</u>
<u>21</u>	<u>18°27'39.644"</u>	<u>33°36'32.853"</u>
<u>22</u>	<u>18°27'43.174"</u>	<u>33°36'37.150"</u>
<u>23</u>	<u>18°27'47.223"</u>	<u>33°36'42.079"</u>
<u>24</u>	<u>18°27'51.230"</u>	<u>33°36'46.957"</u>
<u>25</u>	<u>18°27'58.019"</u>	<u>33°37'01.145"</u>
<u>26</u>	<u>18°27'45.440"</u>	<u>33°35'50.245"</u>

## 1.1 Project Activities and Potential Environmental Impacts

The activities associated with the construction of the power line will include site clearance and construction of access roads to facilitate access to the site (where required, where existing access roads are not present). A servitude of 36m will

be required along the length of the power line during operation. Construction of the proposed power line will take approximately 12 months to complete.

### **1.1.1. Construction Phase**

Power lines are constructed in the following simplified sequence:

- Step 1:** Negotiation of final route with affected landowners
- Step 2:** Survey of the route (by air)
- Step 3:** Determination of the conductor type
- Step 4:** Selection of best-suited conductor, towers, insulators, foundations
- Step 5:** Final design of line and placement of towers
- Step 6:** Issuing of tenders, and award of contract to construction companies
- Step 7:** Vegetation clearance and construction of access roads (where required)
- Step 8:** Tower pegging
- Step 9:** Construction of foundations
- Step 10:** Assembly and erection of towers on site
- Step 11:** Stringing of conductors
- Step 12:** Rehabilitation of disturbed area and protection of erosion sensitive areas
- Step 13:** Testing and commissioning
- Step 14:** Continued maintenance

The construction of the power line will require the establishment of a construction equipment camp/s at an appropriate location along the route. No employees will reside at the construction site at any time during the construction phase. 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).

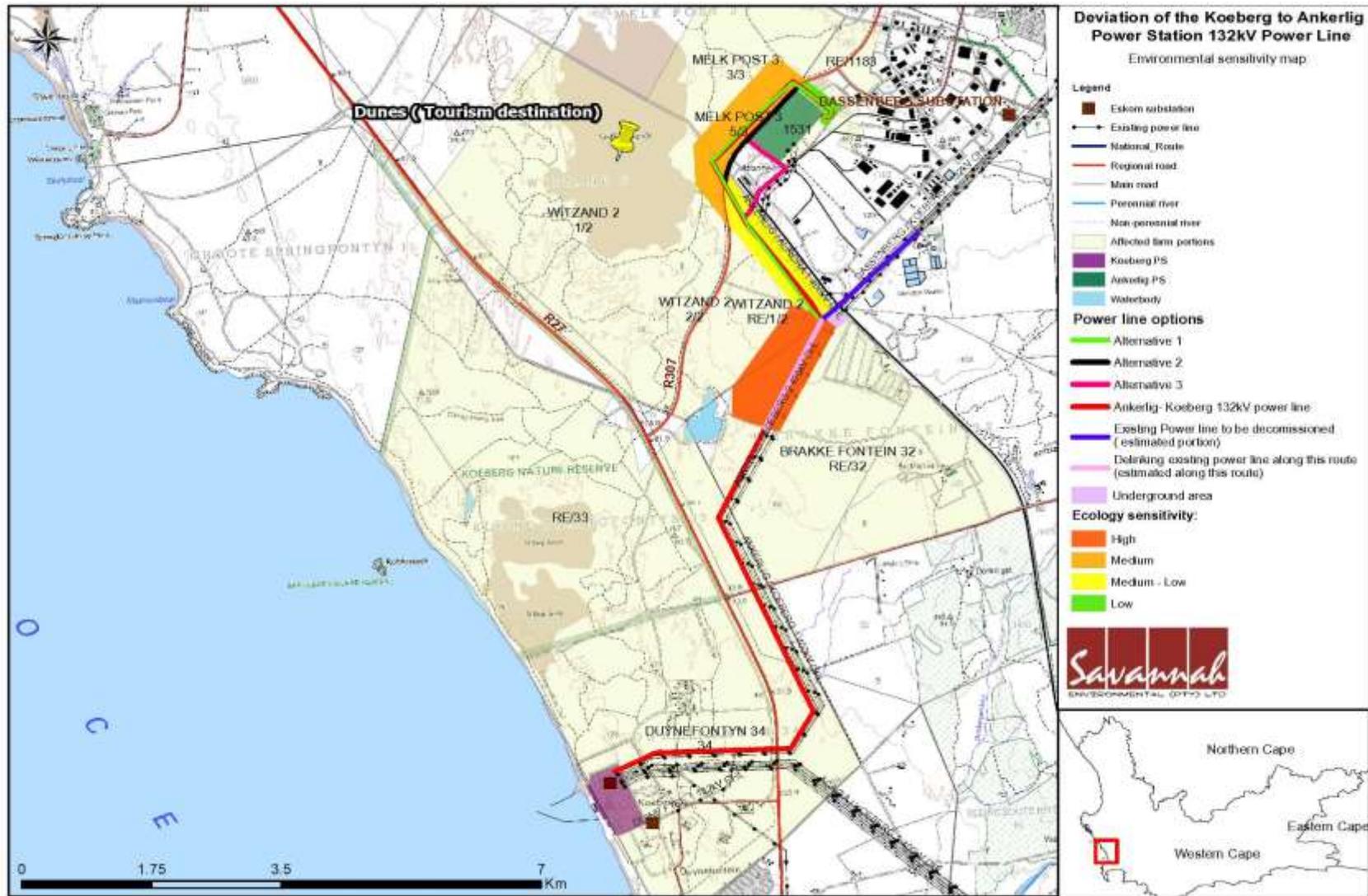
Construction of the power line is required to be undertaken in accordance with the specifications of this Environmental Management Plan (EMP).

### **1.1.2. Potential Environmental Impacts Associated with the Construction Phase**

Potential impacts identified through the EIA process to be associated with the construction of the power line include:

- » Impacts on flora and fauna as a result of disturbance and/or loss of sensitive species and habitats.
- » Impacts on avifauna as a result of the disturbance and/or destruction of habitats.
- » Impacts on heritage sites as a result of disturbance or destruction of these sites due to construction activities.
- » Visual impacts associated with the construction phase.
- » Impacts in terms of increased potential for soil erosion and loss of agricultural land.
- » Impacts on the social environment as a result of influx of construction workers and job seekers, disruption in daily movement patterns and nuisance impacts (such as noise and dust impacts).

Although some impacts of high significance were identified through the EIA process, it was concluded that the majority of these impacts could be successfully mitigated through the implementation of this EMPr.



**Figure 1.2:** Sensitivity Map for the proposed deviation of 132kV power line between Ankerlig and Koeberg Power Stations

## CHAPTER 2: PURPOSE AND OBJECTIVES OF THE EMPr

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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 EMPr 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. An effective EMPr is concerned with both the immediate outcome as well as the long-term impacts of the project.

The EMPr provides specific environmental guidance to the Contractor for the construction phase of a project, and is intended to manage and mitigate construction activities so that unnecessary or preventable environmental impacts do not result. This document is part of the contract and supplementary to Eskom’s Specification for Transmission Line Towers and Line Construction. The recommendations and constraints, as set out in this document are enforceable under the general conditions of contract.

This EMPr 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 EMPr has the following objectives:

- » Outline mitigation measures and environmental specifications which are required to be implemented for the construction phase of the project in order to manage and minimise the extent of potential environmental impacts associated with the power line.

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

- » Ensure that construction of the project does 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 EMPr, and ensure the minimisation of adverse environmental impacts to an acceptable level.

Eskom Holdings SOC Limited 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.

Eskom requires a commitment from the Eskom Project Manager and the Contractor on the following issues:

- » Take into consideration the Landowner special conditions as the line traverses private property.
- » To underwrite Eskom Transmission's Environmental Policy at all times.
- » Ensure environmental conditions stipulated in the Environmental Authorisation are implemented.
- » Resolve problems and claims arising from damage immediately to ensure a smooth flow of operations.

- » To implement this EMP for the benefit of all involved.
- » To preserve the natural environment by limiting destructive actions on site.

## CHAPTER 3: STRUCTURE OF THIS EMPR

The first two chapters provide background to the EMP and the proposed project, 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 deviation of existing 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 EMPr 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 EMPr table has been established for each environmental objective. The information provided within the EMPr table for each objective is outlined below.

### ***OBJECTIVE 1: 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.

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

<b>Performance</b>	Description of key indicator(s) that track progress/indicate the
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<b>Indicator</b>	effectiveness of the EMPr.
<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 EMPr 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 EMPr Revision

The scope of work in preparation of this revision of the EMPr was as follows:

- » Undertake an ecological survey (walkthrough) to confirm the potential presence of listed plant species at the tower positions and provide mitigation measures as well as specify permitting requirements for the removal of listed species where applicable.
- » Undertake a heritage survey (walkthrough) to confirm the potential presence of heritage features, artefacts etc. in the landscape and provide mitigation measures as well as specify permitting requirements where applicable.
- » Undertake an avifauna survey (walkthrough) to identify sensitive avifaunal areas along the power line and provide mitigation measures required to be implemented.
- » Consider the findings, mitigation and permitting requirements of the above specialist studies.
- » Provide a revised EMPr for the construction of the deviation of the Ankerlig-Koeberg power line considering previous studies, EMPs and most recent information.

### 3.2 Project Team

This draft EMPr was compiled by Jo-Anne Thomas

- » *Jo-Anne Thomas* – is a registered Professional Natural Scientist and holds a Master of Science degree. She has 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 involved in undertaking siting processes as well as EIAs for several renewable energy 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. Jo-Anne Thomas has managed and drafted EMPs for other electricity projects throughout South Africa, including major Eskom power lines.

## CHAPTER 4: MANAGEMENT PROGRAMME: CONSTRUCTION

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

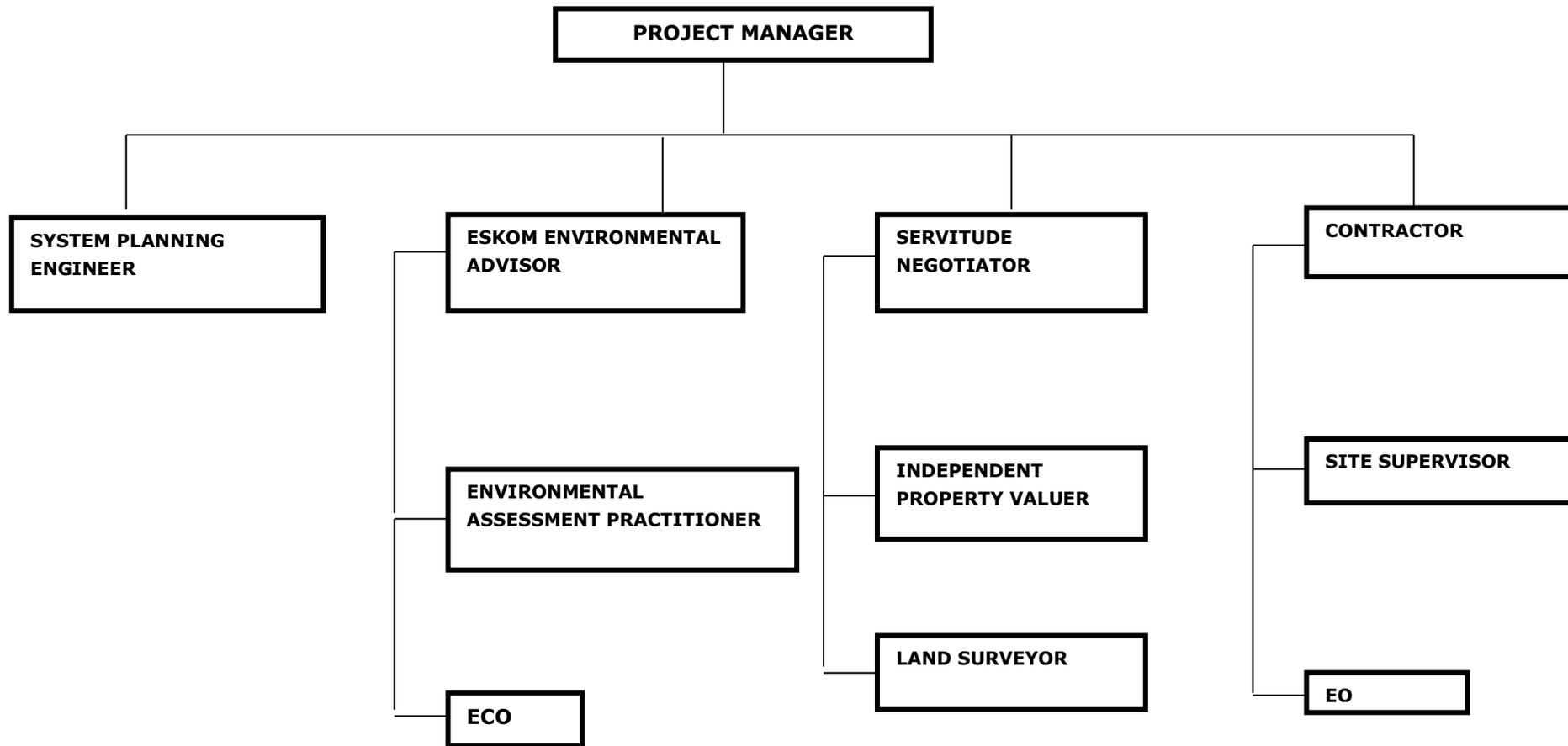
- » Ensures that construction activities are properly managed in respect of environmental aspects and impacts.
- » Enables construction activities to be undertaken without significant disruption to other land uses and activities in the area, in particular concerning noise impacts, farming practices, 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.

### 4.1. Project Responsibilities and Reporting Structure during the Construction Phase

Several professionals will form part of the construction team. The most important from an environmental perspective are the **Project Manager/Site Manager**, the **Environmental Control Officer (ECO)**, the **contractor** and the **developer**.

The Project Manager/Site Manager represents and acts on behalf of Eskom regarding the administration of contracts, and is responsible for the implementation of the EMPr on the site during the pre-construction and construction phases of the project. The ECO is responsible for monitoring the implementation of the EMPr during the design, pre-construction and construction phases of the project. The contractor is responsible for abiding by the mitigation measures of the EMPr which are implemented by the Project Manager during the construction phase.

Figure 4.1 details the reporting structure for the construction phase of the power line.



**Figure 4.1:** Reporting structure for the construction phase of the power line

The developer (i.e. Eskom) is responsible for the implementation of the EMPr during the operational and decommissioning phases of the project. Decommissioning will entail the appointment of a new professional team and responsibilities will be similar to those during the design, pre-construction and construction phases.

Specific responsibilities of each of these parties are detailed in the sections which follow.

#### **4.1.1. Project Manager/Site Manager**

The Project Manager/Site Manager is responsible for overall management of project and EMPr implementation. The following tasks will fall within his/her responsibilities:

- » Be aware of the findings and conclusions of the Environmental Basic Assessment and the conditions stated within the Environmental Authorisation (once issued).
- » Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures.
- » Monitor site activities on a daily basis for compliance.
- » Conduct internal audits of the construction site against the EMPr.
- » Confine the construction site to the demarcated area.
- » Rectify transgressions through the implementation of corrective action.

#### **4.1.2. Environmental Control Officer**

An independent **Environmental Control Officer (ECO)** must be appointed by the project proponent prior to the commencement of any authorised activities and will be responsible for monitoring, reviewing and verifying compliance by the Contractor with the environmental specifications of the EMP and the conditions of the Environmental Authorisation. Accordingly, the ECO 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 EMPr.
- » Be fully knowledgeable with the contents with all relevant environmental legislation, and ensure compliance with them.
- » Be fully knowledgeable of all the licences and permits issued to the site.
- » Be fully knowledgeable of the content of the water use licence and the authorisation granted from the department of forestry and fisheries.

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- » 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 if the EMPr conditions or specifications are not followed then appropriate measures are undertaken to address this.
  - » Ensure that the compliance of the EMPr, EA and the legislation is monitored through regular and comprehensive inspection of the site and surrounding areas.
  - » Ensure that if the EMPr, EA and/or the legislation conditions, regulations or specifications are not followed then appropriate measures are undertaken to address any non-compliances (for example an ECO may cease construction or an activity to prevent a non-compliance from continuing).
  - » 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 EMPr.
  - » 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.
  - » Keep record of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO.
  - » Ensure that any non-compliance or remedial measures that need to be applied are reported.
  - » Keep record of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO.
  - » Independently report to DEA in terms of compliance with the specifications of the EMPr and conditions of the Environmental Authorisation (once issued).

#### **4.1.3. Contractor**

The contractor is responsible for the implementation and compliance with recommendations and conditions of the EMPr.

- » Ensure compliance with the EMPr at all times during construction.
- » Provide all necessary supervision during the execution of the project. He/ She should be available on site all the time.

- 
- » Comply with special conditions as stipulated by landowners during the negotiation process.
  - » Inform and educate all employees about the environmental risks associated with the various activities to be undertaken, and highlight those activities which should be avoided during the construction process in order to minimise significant impacts to the environment.
  - » Maintain an environmental register which keeps a record of all incidents which occur on the site during construction. These incidents include:
    - \* Public involvement / complaints
    - \* Health and safety incidents
    - \* Hazardous materials stored on site
    - \* Non-compliance incidents
  - » Where construction activities are undertaken is close to any inhabited area, the necessary precautions shall be taken by the Contractor to safeguard the lives and property of the inhabitants.
  - » The Contractor shall under no circumstances interfere with the property of landowners, Grid staff or nearby communities.
  - » Should the Contractor require clarity on any aspect of the EMP the Contractor must contact the Environmental Consultant/Officer for advice.

The contractor should employ a **Safety, Health and Environmental Representative** to manage the day-to-day on-site implementation of this EMP, and for the compilation of regular (usually weekly) Monitoring Reports. In addition, the SHE 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 Safety, Health and Environment 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 EMP-related activities on site.

#### **4.2. Eskom Guidelines and Specifications**

Observation of the following Eskom guidelines and specifications during the construction phase is required:

- » Specification for transmission line towers and line construction (TRMSCAAC1 REV 3)
- » Tgl41 – 332: Transmission bird perch guideline
- » Tgl41 – 333: Bird nesting guideline
- » Tgl41 – 334: Vegetation management guideline
- » Tgl41 – 335: Transmission bird collision prevention
- » Tgl41 – 337: Soil erosion guideline
- » Tgl41 – 338: Transmission servitude gates standard guideline
- » Tgl41 – 340: Access to farms
- » Tgl41 – 927: Tree felling guideline

### 4.3. Objectives

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

#### ***OBJECTIVE 1: Minimise impacts related to inappropriate site establishment***

Site establishment is the first activity which is to be undertaken within the construction phase. The Contractor must take all reasonable measures to ensure the safety of the public in the surrounding area. 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 Project Manager.

<b>Project Component/s</b>	» All infrastructure
<b>Potential Impact</b>	» Hazards to landowners and public. » Damage to indigenous natural vegetation, due largely to ignorance of where such areas are located. » Loss of threatened plant species
<b>Activities/Risk Sources</b>	» Excavations. » Movement of construction vehicles in the area and on-site.
<b>Mitigation: Target/Objective</b>	» To secure the site against unauthorised entry. » To protect members of the public/landowners/residents. » No loss of or damage to sensitive vegetation in areas outside the immediate development footprint.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Secure site, working areas and excavations in an	Contractor	Site

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
appropriate manner, as agreed with the Site Manager and ECO.		establishment, and duration of construction
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

**Performance**

» Site is secure and there is no unauthorised entry.

<b>Indicator</b>	<ul style="list-style-type: none"> <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-conformances to the EMP.</li> <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>

**OBJECTIVE 2: 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>» Construction equipment camp</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>

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Undertake search and rescue of Red Data and protected plant species prior to the establishment of the equipment storage area. A permit shall be obtained from the provincial conservation authority prior to this being undertaken.	EO & Contractor	Pre-construction
As far as possible, minimise vegetation clearing and levelling for equipment storage areas.	Contractor	Site establishment, and during construction

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
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
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.	ECO, EO & Contractor	Duration of construction
Contractors must use chemical toilets/ablution facilities situated at designated areas of the site; no ablution 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 may disturb flora or fauna outside of the demarcated construction area/s without the required authorisations and/or permits.	Contractor and sub-contractor/s	Duration of contract
Firefighting 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 to be developed and implemented. Contractors must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct	Contractor and sub-contractor/s	Pre-construction
Eskom to inform the contractors and/or their own employees involved in the project of the relevant evacuation procedures during a nuclear emergency at the KNPS	Eskom	Pre-construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» The construction equipment camps have avoided sensitive areas, as approved by the ECO.</li> <li>» Ablution and waste removal facilities are in a good working order and do not pollute the environment due to mismanagement.</li> <li>» All areas are rehabilitated promptly after construction in an area is complete.</li> <li>» Unauthorised vegetation clearing and levelling is not reported by the ECO.</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 EMPr.</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 EMPr.</li> </ul>

***OBJECTIVE 3: Limit disturbance of flora and fauna, and loss of protected flora and sensitive habitats during construction***

The whole power line route except for the section over the Dassenberg Road lies within various protected Critical Biodiversity Area (CBA), indicating that these areas have high conservation value and impact to these areas is undesirable.

<b>Project component/s</b>	All infrastructure and activities which result in vegetation loss or clearing such as pylon construction or clearing vegetation within the power line servitude.
<b>Potential Impact</b>	Loss of habitat within listed ecosystems and loss of individuals of listed and protected plant species.
<b>Activity/risk source</b>	Construction activities
<b>Mitigation: Target/Objective</b>	Minimal impact on biodiversity & terrestrial environment. Low impact on protected species

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Undertake search and rescue of Red Data and protected plant species prior to the establishment of the equipment storage area. A permit shall be obtained from the provincial conservation authority prior to this being undertaken.	<u>EO</u> & Contractor	Pre-construction
Areas to be cleared shall be clearly marked in the field to eliminate unnecessary clearing <u>in consultation with the ECO</u> .	Contractor & <u>EO</u>	Pre-construction
Preconstruction walk-through of power line route and support structure positions and use micro-siting to reduce local impact.	Contractor & <u>EO</u> in consultation with <u>ECO</u>	Pre-construction
The extent of clearing and disturbance to the indigenous vegetation shall be kept to a minimum so that the impact on flora and faunal habitats is restricted.	Contractor	Site establishment & duration of contract
Vegetation management should be based on site-specific assessment. Sensitive vegetation types and species must be identified and included under a tailored vegetation management plan to be developed following the detailed walk through survey. The intention would be to alert managers and contractors so that these sensitive species or patches of vegetation can be avoided.	Contractor	Construction
During construction, unnecessary disturbance to habitats shall be strictly controlled. Avoiding any sensitive habitats with construction vehicles and equipment during construction must be ensured.	Contractor	Duration of contract
Utilise existing access roads as far as possible.	Contractor	Duration of contract
Any fauna encountered during construction should be <u>reported and</u> removed to safety by the ECO or other suitably qualified person	Contractor & <u>ECO</u>	Duration of contract
All vehicles to adhere to low speed limits (40km/h max) on the site, to reduce risk of faunal collisions as well as reduce dust.	Contractor	Duration of contract
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
Implement an alien plant management plan which	Contractor	Construction

Mitigation: Action/control	Responsibility	Timeframe
includes alien plant clearing where necessary. By hand only and no mechanical clearing of aliens to be used.		and operation

<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>» Vegetation loss restricted to infrastructure footprint.</li> <li>» Protected species avoided by flexible infrastructure such as power line.</li> <li>» Power line servitude which is free of woody aliens.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Vegetation is cleared only within essential areas.</li> <li>» Specialist monitoring of servitudes along CBA sites and all sections of the route, in particular sensitive areas will be crucial in determining whether the recommended management actions are carried out.</li> <li>» Monitor alien plant abundance along the servitude on an annual basis to inform clearing program.</li> </ul>

#### **OBJECTIVE 4: Minimise impact on soil resources and erosion potential**

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Power line towers</li> <li>» Access roads</li> <li>» Construction equipment camp</li> </ul>
<b>Potential Impact</b>	Erosion will cause loss and degradation of soil resources
<b>Activity/risk source</b>	All activities on site will alter surface and/or disturb vegetation cover.
<b>Mitigation: Target/Objective</b>	To have no wind erosion on the site.

Mitigation: Action / control	Responsibility	Timeframe
Keep the surface area of cleared vegetation at any one time to a minimum. Maintain as much vegetation cover as possible throughout the site.	Contractor	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
If an activity will mechanically disturb below surface in any way, then the upper 40 cm of topsoil should first be stripped from the entire disturbed surface and stockpiled for re-spreading during rehabilitation.	Contractor	Duration of construction

Mitigation: Action / control	Responsibility	Timeframe
Excavated topsoil must be stockpiled in designated areas separate from base material at a maximum height and covered until replaced during rehabilitation.	Contractor	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	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
Dispose of all subsurface spoils from excavations where they will not impact on agricultural land (for example on road surfaces) or where they can be effectively covered with topsoil.	Contractor	Duration of contract
Utilise Erosion Control measures, where required	Contractor	Duration of contract
Rehabilitate disturbed areas and stabilise soils after construction	Contractor	Duration of contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Limited erosion on site as a result of construction activities.</li> <li>» disturbed areas are not left without an effective covering of topsoil, and potential for re-vegetation for extended periods</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Establish an effective record keeping system for each area where soil is disturbed for construction purposes. These records should be included in environmental performance reports, and should include all the records below.                             <ul style="list-style-type: none"> <li>• Record the date of topsoil stripping.</li> <li>• Record the date of cessation of construction activities at the particular site.</li> </ul> </li> <li>» Photograph the area on cessation of construction activities.</li> <li>» Record date and depth of re-spreading of topsoil.</li> <li>» Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.</li> </ul>

***OBJECTIVE 5: 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 (including

turbine components) and materials and construction crews to the site and the return of the vehicles after delivery of materials.

Existing public roads will be used during construction, such as the R27 and R307. The section below provides a guideline for the Traffic Management and Transportation Plan on site and will need to be supplemented with the relevant final transport plan devised by the Contractor.

<b>Project Component/s</b>	» Delivery of any component required within the construction phase.
<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>» 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	Contractor	Duration of

Mitigation: Action/Control	Responsibility	Timeframe
must be allowed, unless roads are closed for whatever reason outside the control of the contractor.		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 driver's license.	Contractor	Duration of contract
Signs must be placed along construction roads to identify speed limits, travel restrictions and other standard traffic control information.	Contractor	Duration of contract

<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 6: To avoid and or minimise the potential impact of the activities during the construction on the safety of local communities***

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>	» Construction and establishment activities
<b>Potential Impact</b>	» Impact on safety of landowners and communities (increased crime etc.). Increased fire risk »
<b>Activities/Risk Sources</b>	» The presence of construction workers on the site can pose a potential safety risk to landowners and local communities.
<b>Mitigation: Target/Objective</b>	» To avoid and or minimise the potential impact on local communities and their livelihoods.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
The housing of construction workers on the site should be limited to security personnel.	Contractor	Construction
Inform all land owners of activity on their land	Contractor	All phases of the project
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, Local Municipality, and local communities	Pre-construction and when required
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>	» No criminal activities and theft of livestock are reported to be associated with the construction activities. » No fires or on-site accidents occur.
<b>Monitoring</b>	» Contractor’s EO and appointed ECO must monitor indicators listed above to ensure that they have been implemented.

### **OBJECTIVE 7: 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>» Power line infrastructure.</li> <li>» Access road</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. 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> <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 attributable to 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	Duration of contract
Speed of construction vehicles must be restricted to 40km/hr, or as otherwise defined by the Site Manager.	Contractor	Duration of contract
Disturbed areas must be re-vegetated as soon as practicable once construction in an area is completed.	Contractor	Completion of construction
Vehicles and equipment must be maintained in a road-	Contractor	Duration of

Mitigation: Action/Control	Responsibility	Timeframe
worthy condition at all times.		contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No complaints from affected landowners 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 commences.</li> <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 EMPr.</li> </ul>

### **OBJECTIVE 8: 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 existing servitude between Koeberg and Ankerlig already contains two 400 Kv transmission lines and towers. This is however not the case for the deviation. Further lines will be an addition to a scenario where electrical infrastructure is a locally accepted feature of the landscape. This is not expected to detract from the scenic and qualities of the area as this has already been impacted by the existing servitude. No archaeological material of any significance was observed in this area. The most recent site inspection supports these findings.

<b>Project Component/s</b>	<ul style="list-style-type: none"> <li>» Power line.</li> <li>» Access roads.</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>» 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 & <u>EO</u> in consultation with <u>ECO</u>	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 in consultation with <u>ECO</u>	Duration of contract
Apply for sampling permits from SAHRA for work on any archaeological sites identified as needing intervention.	Eskom Holdings SOC Limited Ltd in consultation with <u>relevant</u> Specialist	Pre-construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Zero 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 ECO 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 EMPr.</li> </ul>

**OBJECTIVE 9: 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 activities along the power line
<b>Potential Impact</b>	Visual impact of general construction activities, and the potential scarring of the landscape due to vegetation clearing.
<b>Activity/risk source</b>	The viewing of the above mentioned by observers near the infrastructure.
<b>Mitigation: Target/Objective</b>	Minimal visual intrusion by construction activities and intact vegetation cover outside of immediate works areas.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Ensure that vegetation is not unnecessarily cleared or removed during the construction period.	Contractor	Construction phase.
Reduce the construction period through careful logistical planning and productive implementation of resources.	Contractor	Planning
Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.	Contractor	Planning
Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.	Contractor	Throughout the construction phase.
Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.	Contractor	Throughout the construction phase.

Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).	Contractor	Throughout the construction phase.
Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.	Contractor	Throughout the construction phase.
Rehabilitate all disturbed areas, construction areas, servitudes etc. immediately after the completion of construction works. Consult an ecologist to give input into rehabilitation specifications.	Contractor	Throughout and at the end of the construction phase.

<b>Performance Indicator</b>	Vegetation cover within the servitudes and in the vicinity of the infrastructure is intact with no evidence of degradation or erosion.
<b>Monitoring</b>	Monitoring of vegetation clearing during construction. Monitoring of rehabilitated areas post construction.

### **OBJECTIVE 10: Appropriate handling and management of waste**

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>» Construction equipment camp</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>

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

Mitigation: Action/Control	Responsibility	Timeframe
		construction
Dispose of all solid waste collected at an appropriately registered waste disposal site. Waste disposal shall be in accordance with all relevant legislation and under no circumstances may waste be burnt on site.	Contractor	Duration of 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 EMPr.</li> </ul>

### ***OBJECTIVE 11: 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>	» Storage and handling of chemicals, hazardous substances.
<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:</b>	» To ensure that the storage and handling of chemicals and

<b>Target/Objective</b>	<p>hydrocarbons on-site does not cause pollution to the environment or harm to persons.</p> <p>» To ensure that the storage and maintenance of machinery on-site does not cause pollution of the environment or harm to persons.</p>
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<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
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

Mitigation: Action/Control	Responsibility	Timeframe
The sediment control and water quality structures used on-site must be monitored and maintained in an operational state at all times.	Contractor	Duration of contract
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 EMPr.</li> </ul>

#### 4.4. Tower Specific Management Measures

##### 4.4.1. Summary of Findings of the Walk Through Surveys

Walk through reports are contained within Appendix D. In summary, the following is of relevance to the tower specific management measures.

##### i) Heritage

The findings of the walk down are that only a single archaeological site was found which is located 100m east of the route. This can easily be protected during construction and maintenance by avoiding it. It will not require any repositioning of pylons. A single stone artefact was noted within the Koeberg Nature Reserve (in the southern section of the line where no construction is planned), while a stone feature that could be a grave was recorded close to the route. The suspected grave was pointed out to Eskom conservation staff who have recorded its position. It is best avoided; however no adjustment of the route is called for. Maintenance teams should cordon it off and avoid it.

##### ii) Avifauna

A total of 171 bird species were recorded in the area through which the line passes (including the coast where this line does not pass). Of these, 18 were collision prone species as ranked by the BAWESG (2011), and 13 of these were

red-listed. Excluding the coastal waterbirds (cormorants, penguins and oystercatcher), that will not be impacted by this line, 9 red-listed species are likely to occur near the power line option.

The most important bird habitat is the wetland near the Water Treatment works just off the main Atlantis Road (along the existing portion of the power line where no construction is planned). These pans always contain (fresh) water and islands where wetland birds can roost. In the central sections, the line runs parallel with the R27 but also through alien vegetation – again bird-poor habitat. Some raptors are likely to use the existing lines for perching and hunting, and Steppe Buzzards often hunt the road verge for mice.

iii) Ecology

The power line occurs almost entirely within listed ecosystems, within Atlantis Sand Fynbos (Critically Endangered) and within Cape Flats Dune Strandveld (Endangered). Only 43% of Cape Flats Dune Strandveld remains and 51% of Atlantis Sand Fynbos. Both vegetation types have exceptional levels of diversity and associated species of conservation concern, with 66 red data species known from Cape Flats Dune Strandveld and 84 from Atlantis Sand Fynbos. Any additional habitat loss within these vegetation types is undesirable and intact fragments should be avoided as much as possible.

The Western Cape Nature Conservation Laws Amendment Act provides lists of protected species of plant and animals and in some cases whole plant genera or families may be listed as protected. Of particular relevance are the following, which highlights the plant genera and families most likely to be encountered at the site, but is not intended to be a comprehensive list.

Schedule 4 Protected Flora:

- » Amaryllidaceae – All species
- » Lachenalia – All Species
- » Iridaceae – All Species
- » Mesembryanthemaceae – All species
- » Orchidaceae – All species
- » Diascia – All species

In terms of fauna, the following *inter alia* are protected and may not be hunted, captured or harmed without a permit:

- » All tortoises
- » All lizards
- » All frogs
- » Most snakes
- » All indigenous antelope
- » Aardvark
- » Most small carnivores such as Honey Badger, Cape Fox, Bat-eared Fox, Large Grey Mongoose etc.
- » Most birds except pest species

The results of the walk through survey indicate that many of the towers are located within disturbed areas and do not require mitigation. Mitigation in particular was considered for those pylons situated in very good quality Cape Flats Dune strandveld (between Pylon 22 and 18) and in slightly degraded strandveld between Pylon 17 and 11. This mitigation is detailed in Table 4.1.

There were no active burrows of any listed mammal or reptile species in the immediate vicinity of the proposed pylon position areas. Furthermore there were no nests or roosting sites of avifauna within the pylon footprints. As a result there are no faunal issues that require avoidance. However, during construction, some fauna may be disturbed and should be allowed to move off undisturbed.

#### **4.4.2. Tower Specific Management Measures**

The table in this section of the report is structured to consider the re-alignment and/or the shift in tower positions as well as specialist information specific to each tower. The respective tower positions within line alignment are shown on the aerial photograph (Google Earth) provided in Figure 4.1.



**Figure 4.1:** Satellite image showing the location of the Ankerlig power line pylon positions and the power line route. The tower positions are indicated by the red dots.

**Table 4.1:** Tower specific management requirements

<b>Tower</b>	<b>Co-ordinates</b>	<b>Aspect</b>	<b>Specific Management Measures</b>
1	<u>33°35'21.729"S</u> <u>18°28'03.837"E</u>	<u>Ecology</u>	<u>Degraded area where rehabilitation was not been implemented properly (i.e. no follow up weed management, seeding and replanting) dominated by <i>Tetragonia frutiocosa</i>, <i>Raphanus raphanistrum</i> and <i>Trachyandra divaricata</i>. Additional species include <i>Salvia cf. lanceolata</i>, <i>Ruschia macowanii</i>, <i>Cynodon dactylon</i>, <i>Hellmuthia membranacea</i> and <i>Zygophyllum sp.</i></u>  <u>No specific mitigation is required.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
2	<u>33°35'20.430"S</u> <u>18°28'05.200"E</u>	<u>Ecology</u>	<u>Same habitat as Tower 1. No specific mitigation is required.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
3	<u>33°35'17.384"S</u> <u>18°28'01.147"E</u>	<u>Ecology</u>	<u>Located on almost flat ground along disturbed edge near rehabilitated dune/embankment. The area is highly degraded and covered mostly with alien grasses.</u>  <u>No specific mitigation is required.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
4	<u>33°35'14.050"S</u> <u>18°27'56.710"E</u>	<u>Ecology</u>	<u>Same habitat as Tower 3. No specific mitigation is required.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
5	<u>33°35'10.428"S</u> <u>18°27'51.889"E</u>	<u>Ecology</u>	<u>Same habitat as Tower 3. No specific mitigation is required.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on</u>

<b>Tower</b>	<b>Co-ordinates</b>	<b>Aspect</b>	<b>Specific Management Measures</b>
			<u>the tower.</u>
<u>6</u>	<u>33°35'09.820"S</u> <u>18°27'49.730"E</u>	<u>Ecology</u>	<u>Transformed area located within Ankerlig Power Station. No specific mitigation is required.</u>
		<u>Heritage</u>	<u>Transformed area located within Ankerlig Power Station. No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>7</u>	<u>33°35'14.623"S</u> <u>18°27'44.291"E</u>	<u>Ecology</u>	<u>Transformed area located within Ankerlig Power Station. No specific mitigation is required.</u>
		<u>Heritage</u>	<u>Transformed area located within Ankerlig Power Station. No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>8</u>	<u>33°35'19.999"S</u> <u>18°27'38.203"E</u>	<u>Ecology</u>	<u>Transformed area located within Ankerlig Power Station. No specific mitigation is required.</u>
		<u>Heritage</u>	<u>Transformed area located within Ankerlig Power Station. No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>9</u>	<u>33°35'25.921"S</u> <u>18°27'31.495"E</u>	<u>Ecology</u>	<u>Transformed area located within Ankerlig Power Station. No specific mitigation is required.</u>
		<u>Heritage</u>	<u>Transformed area located within Ankerlig Power Station. No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>10</u>	<u>33°35'30.727"S</u> <u>18°27'26.052"E</u>	<u>Ecology</u>	<u>Transformed area located within Ankerlig Power Station. No specific mitigation is required.</u>
		<u>Heritage</u>	<u>Transformed area located within Ankerlig Power Station. No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>11</u>	<u>33°35'35.773"S</u> <u>18°27'22.698"E</u>	<u>Ecology</u>	<u>Semi-intact vegetation with the same array of species at Tower 12. No specific mitigation is required.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>12</u>	<u>33°35'40.290"S</u>	<u>Ecology</u>	<u>Intact vegetation on top of a dune. Dominant species include <i>Thamnochortus spicigerus</i>, <i>Ehrharta villosa</i> and <i>Joordaniella dubia</i>. Additional species include <i>Lachenalia rubida</i>, <i>Muraltia spinosa</i>,</u>

<b>Tower</b>	<b>Co-ordinates</b>	<b>Aspect</b>	<b>Specific Management Measures</b>
	<u>18°27'19.695"E</u>		<u>Searsia glauca, Euclea racemosa, Metalasia muricata and Olea exasperata.</u>  <u>Move tower off the top of the dune to disturbed patch at waypoint 002 (33°35'39.20"S; 18°27'19.63"E).</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>13</u>	<u>33°35'45.446"S</u> <u>18°27'16.267"E</u>	<u>Ecology</u>	<u>Semi-intact to intact vegetation with a mosaic of shrubs and open patches. The open patches are dominated by <i>Ehrharta villosa</i>, <i>Jordaaniella dubia</i> and <i>cf. Arctotis sp.</i> The dominant shrubs and restioids include <i>Thamnochortus spicigerus</i>, <i>Pelargonium sp.</i>, <i>Metalasia muricata</i> and <i>Ruschia indecora</i> (ENDANGERED).</u>  <u>The tower would have less impact if positioned closer to the fence line at the industrial area to the south-east.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>14</u>	<u>33°35'50.240"S</u> <u>18°27'13.080"E</u>	<u>Ecology</u>	<u>Same habitat as Tower 12 with additional species including <i>Limonium peregrinum</i> and <i>Euphorbia mauritanica</i>.</u>  <u>The tower should be moved off the dune to the disturbed patch at waypoint 004 (33°35'50.74"S; 18°27'12.83"E).</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>15</u>	<u>33°35'57.688"S</u> <u>18°27'16.110"E</u>	<u>Ecology</u>	<u>Disturbed area dominated by <i>Ehrharta villosa</i>, with a large <i>Searsia glauca</i> plant. Additional species include <i>Albuca sp.</i> and <i>Ruschia macowanii</i>.</u>  <u>Avoid large <i>Searsia</i> shrubs if possible.</u>

<b>Tower</b>	<b>Co-ordinates</b>	<b>Aspect</b>	<b>Specific Management Measures</b>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>16</u>	<u>33°36'03.253"S</u> <u>18°27'18.374"E</u>	<u>Ecology</u>	<u>Mosaic or disturbed open patches covered with <i>Ehrharta villosa</i> and <i>Jordaaniella dubia</i> and large shrubs including <i>Searsia glauca</i> and several <i>Euclea racemosa</i> plants. Additional species include <i>Thamnochortus spicigerus</i> and <i>Cotyledon orbiculata</i>.</u>  <u>Note shrubs are important habitat refuge and should be avoided.</u>  <u>The shrubs could be avoided by moving the tower 10m south.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>17</u>	<u>33°36'10.592"S</u> <u>18°27'21.359"E</u>	<u>Ecology</u>	<u>Area heavily infested with <i>Acacia saligna</i> and <i>Acacia cyclops</i>. Area needs to be cleared of Invasive Alien Plants (IAPs).</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>18</u>	<u>33°36'15.238"S</u> <u>18°27'25.175"E</u>	<u>Ecology</u>	<u>Semi-intact to intact vegetation located on top of a dune. The vegetation is dominated by <i>Euclea racemosa</i>, with open patches containing low-growing species including cf. <i>Arctotis</i> sp. and <i>Jordaaniella dubia</i>. Additional species include <i>Asparagus capensis</i>, <i>Euphorbia mauritanica</i>, <i>Limonium peregrinum</i>, <i>Ruschia indecora</i> (ENDANGERED), <i>Searsia glauca</i> and <i>Romulea flava</i>.</u>  <u>No leeway to reposition the pylon The surrounding habitat is the same.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>19</u>	<u>33°36'19.826"S</u>	<u>Ecology</u>	<u>Intact, good condition Cape Flats Dune Strandveld of the same type at Tower 22.</u>

<b>Tower</b>	<b>Co-ordinates</b>	<b>Aspect</b>	<b>Specific Management Measures</b>
	<u>18°27'28.944"E</u>		<u>Construction of a service road through this vegetation will have a High Impact. Moving the site to waypoint 001 (33°36'20.80"S; 18°27'29.82"E) would be slightly less harmful since the vegetation is in a semi-intact condition at this point.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>20</u>	<u>33°36'26.326"S</u> <u>18°27'34.283"E</u>	<u>Ecology</u>	<u>Degraded area overrun with <i>Acacia cyclops</i> and <i>Acacia saligna</i> and dominated by <i>Ehrharta villosa</i>. Additional species include <i>Zygophyllum morgsana</i>, <i>Trachyandra ciliaris</i>, <i>Asparagus capensis</i> and <i>Searsia laevigata</i>.</u>  <u>No specific mitigation is required.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>21</u>	<u>33°36'32.853"S</u> <u>18°27'39.644"E</u>	<u>Ecology</u>	<u>Dense patch of <i>Ruschia indecora</i> (ENDANGERED) along with additional species such as <i>Searsia laevigata</i>, <i>Trachyandra ciliata</i> and <i>Trachyandra sp.</i>, <i>Zygophyllum sp.</i> and <i>Babiana cf. tubulosa</i> (VULNERABLE).</u>  <u>Since the general area supports high numbers of <i>Ruschia indecora</i> there is no leeway to reposition the tower.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>22</u>	<u>33°36'37.150"S</u> <u>18°27'43.174"E</u>	<u>Ecology</u>	<u>Intact, good condition Cape Flats Dune Strandveld located on a dune.</u>  <u>Dominant species include <i>Searsia laevigata</i>, <i>Euphorbia mauritanica</i>, <i>Ruschia indecora</i> (ENDANGERED) and <i>Euclea racemosa</i>. Additional species: <i>Carpobrotus acinaciformis</i>, <i>Searsia glauca</i>, <i>Putterlickia pyracantha</i>, <i>Ficinia sp.</i> and <i>Ruschia macowanii</i>.</u>

<b>Tower</b>	<b>Co-ordinates</b>	<b>Aspect</b>	<b>Specific Management Measures</b>
			<u>Construction of a service road through this vegetation will have a High Impact.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>23</u>	<u>33°36'42.079"S</u> <u>18°27'47.223"E</u>	<u>Ecology</u>	<u>Moderate to dense infestations of <i>Acacia cyclops</i> with partial clearing carried out. Intact vegetation occurs with infestations of <i>Acacia cyclops</i> at varying levels of cover density.</u>  <u>Species: <i>Searsia laevigata</i>, <i>Trachyandra ciliata</i>, <i>Albuca sp.</i>, <i>Putterlickia pyracantha</i>, <i>Euphorbia mauritanica</i>, <i>Ruschia indecora</i> (ENDANGERED) and <i>Thamnochortus spicigerus</i>.</u>  <u>Note that <i>Ruschia indecora</i> also occurs in the surrounding habitat. Thus moving the tower would not mitigate impacts.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>24</u>	<u>33°36'46.957"S</u> <u>18°27'51.230"E</u>	<u>Ecology</u>	<u>Disturbed area dominated by <i>Ehrharta villosa</i>, <i>Cynodon dactylon</i>, <i>Acacia saligna</i> and <i>Raphanus raphanistrum</i>. Additional species include <i>Searsia laevigata</i>, <i>Osteopermum moniliferum</i>, <i>Trachyandra ciliata</i>, <i>Euphorbia mauritanica</i>, <i>Searsia glauca</i> and <i>Brunsvigia orientalis</i>.</u>  <u>No specific mitigation is required.</u>
		<u>Heritage</u>	<u>Shell midden located close to the route (waypoint 33°36'47.58"S; 18°27'56.98"E). A 20 meter buffer around this location is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>25</u>	<u>33°37'01.145"S</u> <u>18°27'58.019"E</u>	<u>Ecology</u>	<u>No specific mitigation is required.</u>
		<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>
<u>26</u>	<u>33°35'50.245"S</u>	<u>Ecology</u>	<u>No specific mitigation is required.</u>

<b>Tower</b>	<b>Co-ordinates</b>	<b>Aspect</b>	<b>Specific Management Measures</b>
	<u>18°27'45.440"E</u>	<u>Heritage</u>	<u>No specific mitigation is required.</u>
		<u>Avifauna</u>	<u>Tower to include appropriate mitigation (such as spikes) to prevent large birds from perching on the tower.</u>

#### 4.5. Detailing Method Statements

***OBJECTIVE 12: 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 EMPr 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:

- » Responsible person/s
- » 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).

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- » 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 (08h00 – 17h00) 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.

#### **4.6. Awareness and Competence: Construction Phase**

***OBJECTIVE 13: 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 EMPr 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 EMPr 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.

#### **4.6.1. 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.

#### **4.5.2. 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 EMPr 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.

#### **4.5.3. 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.

#### **4.7. Monitoring Programme: Construction Phase**

***OBJECTIVE 14: 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 EMPr, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr 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), EMPr, 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.

#### ***4.6.1. 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.

#### ***4.6.2. 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.

#### ***4.6.3. 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. 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 EMPr.

## CHAPTER 5: MANAGEMENT PROGRAMME: REHABILITATION

**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.

### 5.1. Objectives

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

***OBJECTIVE 1: 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>» Construction camp</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>

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
All temporary facilities, equipment, and waste materials must be removed from site.	Contractor	Following execution of the

Mitigation: Action/Control	Responsibility	Timeframe
		works
All temporary fencing and danger tape must be removed once the construction phase has been completed.	Contractor	Following 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 and should be approved by the Site Manager and Eskom.	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 Holdings SOC Limited Ltd in consultation with rehabilitation specialist	Post-rehabilitation
Erosion control measures should be used in	Contractor	Post-

Mitigation: Action/Control	Responsibility	Timeframe
sensitive areas.		rehabilitation
On-going alien plant monitoring and removal must be undertaken on all areas of natural vegetation on an annual basis.	Eskom Holdings SOC Limited Ltd	Post-rehabilitation

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» All portions of site, including construction equipment camp and working areas, cleared of equipment and temporary facilities.</li> <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> <li>» Ensure that the specific vegetation plan compiled for the site is implemented.</li> </ul>

**APPENDIX A:  
ENVIRONMENTAL AUTHORISATION**

**APPENDIX B:  
MAPS SHOWING TOWER POSITIONS**

**APPENDIX C:  
RELEVANT LEGISLATION**

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

- » 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 1.

**Table 1:** Relevant legislative and permitting requirements applicable to the proposed power line

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
<b>National Legislation</b>			
National Environmental Management Act (Act No. 107 of 1998)	<p>The Basic Assessment Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations.</p> <p>In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant</p>	<ul style="list-style-type: none"> <li>» National Department of Environmental Affairs</li> <li>» Western Cape Department of Environmental Affairs and Development Planning (DEA&amp;DP)</li> </ul>	The listed activities triggered by the proposed substation have been identified and assessed in a Basic Assessment Process. <u>Environmental Authorisation was issued in August 2015.</u>

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	<p>environmental authorisation.</p> <p>In terms of GN R543, R544 and R546 of 18 June 2010, a Basic Assessment Process is required to be undertaken for the proposed project.</p>		
National Environmental Management Act (Act No. 107 of 1998)	<ul style="list-style-type: none"> <li>» A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts.</li> <li>» 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 a project is avoided, stopped or minimised.</li> </ul>	National Department of Environmental Affairs	<ul style="list-style-type: none"> <li>» While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the proposed project has found application in the environmental process.</li> <li>» The implementation of mitigation measures are included as part of the Draft EMP and will continue to apply throughout the life cycle of the project.</li> </ul>
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	<ul style="list-style-type: none"> <li>» Provides for the MEC/Minister to identify any process or activity in such a listed ecosystem as a threatening process (S53)</li> <li>» A list of threatened and protected species has been published in terms of S56 (1) - Government Gazette 29657.</li> <li>» Three government notices have been published, i.e. GN R 150 (Commencement of Threatened and</li> </ul>	<ul style="list-style-type: none"> <li>» National Department of Environmental Affairs</li> <li>» <u>CapeNature</u></li> </ul>	<ul style="list-style-type: none"> <li>» Specialist flora and fauna studies were undertaken as part of the EIA process as required by GNR 152.</li> <li>» A number of protected plant species are known to occur in the area. A permit will be required should any protected plant species on site be disturbed or destroyed as a result of the proposed development.</li> </ul>

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	<p>Protected Species Regulations, 2007), GN R 151 (Lists of critically endangered, vulnerable and protected species) and GN R 152 (Threatened or Protected Species Regulations).</p> <p>» Provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (G 34809, GN 1002), 9 December 2011).</p> <p>» This Act also regulates alien and invader species.</p>		
<p>National Environmental Management: Waste Act,</p>	<p>» The Minister may by notice in the Gazette publish a list of waste</p>	<p>» National Department of Water and Environmental Affairs</p>	<p>» As no waste disposal site is to be associated with the proposed project,</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
2008 (Act No. 59 of 2008)	<p>management activities that have, or are likely to have, a detrimental effect on the environment.</p> <ul style="list-style-type: none"> <li>» In terms of the regulations published in terms of this Act (GN 921 of November 2013), a Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities.</li> <li>» Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that                             <ul style="list-style-type: none"> <li>(a) The containers in which any waste is stored, are intact and not corroded or in any other way rendered unfit for the safe storage of waste;</li> <li>(b) Adequate measures are taken to prevent accidental spillage or leaking;</li> <li>(c) The waste cannot be blown away;</li> <li>(d) Nuisances such as odour, visual impacts and breeding of vectors do not arise; and</li> <li>(e) Pollution of the environment and harm to health are prevented.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>» Western Cape Department of Environmental Affairs and Development Planning</li> </ul>	<p>no permit is required in this regard.</p> <ul style="list-style-type: none"> <li>» Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of this Act, as detailed in the EMP.</li> <li>» The volumes of waste to be generated and stored on the site during construction and operation of the power line will not require a waste license (provided these remain below the prescribed thresholds).</li> </ul>
National Environmental Management: Air Quality	<ul style="list-style-type: none"> <li>» S18, S19 and S20 of the Act allow certain areas to be declared and</li> </ul>	<ul style="list-style-type: none"> <li>» District Municipality</li> <li>» Metropolitan Municipality</li> </ul>	<ul style="list-style-type: none"> <li>» While no permitting or licensing requirements arise from this</li> </ul>

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
Act (Act No. 39 of 2004)	<p>managed as "priority areas"</p> <ul style="list-style-type: none"> <li>» Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards</li> <li>» The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act.</li> <li>» Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan.</li> </ul>		<p>legislation, this Act will find application during the construction phase of the project.</p> <ul style="list-style-type: none"> <li>» The Air Emissions Authority (AEL) may require the compilation of a dust management plan.</li> </ul>
National Water Act (Act No. 36 of 1998)	<ul style="list-style-type: none"> <li>» Under S21 of the act, water uses must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation.</li> <li>» In terms of S19, 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.</li> </ul>	<ul style="list-style-type: none"> <li>» National Department of Water Affairs</li> <li>» Department of Water Affairs</li> </ul>	<ul style="list-style-type: none"> <li>» A general permitting or licensing is a requirement from this legislation for river and wetland crossings. There are no drainage lines or wetlands within the proposed power line corridor.</li> </ul>
Environment Conservation Act (Act No. 73 of 1989)	<ul style="list-style-type: none"> <li>» National Noise Control Regulations (GN R154 dated 10 January 1992)</li> </ul>	<ul style="list-style-type: none"> <li>» National Department of Environmental Affairs</li> </ul>	<ul style="list-style-type: none"> <li>» There is no requirement for a noise permit in terms of the legislation.</li> </ul>

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
		» Local Authorities	<ul style="list-style-type: none"> <li>» Any noisy activities carried out during the construction phase that could present an audible impact to the local community should be limited to 6:00am to 6:00pm Monday – Saturday (excluding public holidays).</li> <li>» Should these specific activities need to be undertaken outside of these times, the surrounding communities will need to be notified and appropriate approval will be obtained from the DEA and the Local Municipality.</li> </ul>
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	<ul style="list-style-type: none"> <li>» A mining permit or mining right may be required where a mineral in question is to be mined (i.e. materials from a borrow pit) in accordance with the provisions of the Act.</li> <li>» Requirements for Environmental Management Programmes and Environmental Management Plans are set out in S39 of the Act.</li> </ul>	Department of Mineral Resources	As no borrow pits are expected to be required, no mining permit or mining right is required to be obtained.
National Heritage Resources Act (Act No. 25 of 1999)	<ul style="list-style-type: none"> <li>» S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including                             <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</li> </ul> </li> </ul>	South African Heritage Resources Agency  <u>Heritage Western Cape</u>	<ul style="list-style-type: none"> <li>» A Notice of Intent to Develop was submitted to Heritage Western Cape in terms of the requirements of Section 38.</li> <li>» A permit may be required should heritage sites be unearthed on site during the construction phase.</li> </ul>

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	<p>length;</p> <ul style="list-style-type: none"> <li>» The relevant Heritage Authority must be notified of developments such as linear developments (i.e. 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.</li> <li>» Stand alone 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 S38. In such cases only those components not addressed by the EIA should be covered by the heritage component.</li> </ul>		
National Forests Act (Act No. 84 of 1998)	<ul style="list-style-type: none"> <li>» In terms of S5 (1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected</li> </ul>	National Department of Agriculture, Forestry and Fisheries	No protected trees are likely to occur on site.

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	<p>tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated".</p> <p>» GN 1042 provides a list of protected tree species.</p>		
<p>National Veld and Forest Fire Act (Act 101 of 1998)</p>	<p>» Provides requirements for veldfire prevention through firebreaks and required measures for fire-fighting. Chapter 4 places a duty on landowners to prepare and maintain firebreaks, and Chapter 5 places a duty on all landowners to acquire equipment and have available personnel to fight fires.</p> <p>» In terms of S21 the applicant would be obliged to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land.</p> <p>» In terms of S12 the firebreak would need to be 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 S17, the applicant must</p>	<p>National Department of Agriculture, Forestry and Fisheries</p>	<p>While no permitting or licensing requirements arise from this legislation, this act will find application during the operational phase of the project in terms of fire prevention and management.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	<p>have such equipment, protective clothing, and trained personnel for extinguishing fires.</p>		
<p>Hazardous Substances Act (Act No. 15 of 1973)</p>	<ul style="list-style-type: none"> <li>» This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising, or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</li> <li>» Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared to be Group I or Group II hazardous substance;</li> <li>» Group IV: any electronic product;</li> <li>» Group V: any radioactive material.</li> </ul>	<p>Department of Health</p>	<p>It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	» The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.		
<b>Provincial Legislation</b>			
Western Cape Noise Control Regulations: PN 627 of 1998	The control of noise in the Western Cape Province is legislated in the form of Noise Control Regulations promulgated in terms of section 25 of the Environment Conservation Act No. 73 of 1989.	Western Cape DEA&DP	In terms of Regulation 4 of the Noise Control Regulations: "No person shall make, produce or cause a disturbing noise (greater than 5 dBA), or allow it to be made, produced or caused by any person, animal, machine, device or apparatus or any combination thereof".
Western Cape Land Use Planning Ordinance 15 of 1985	» Details land subdivision and rezoning requirements and procedures	» Western Cape Department of Environmental Affairs and Development Planning » Local authorities	Rezoning may be required to be undertaken following the issuing of an environmental Authorisation for the proposed project.
The Nature and Environmental Ordinance 19 of 1974, (as amended by the Western Cape Nature Conservation Laws Amendment Act, Act 2 of 2000	The Nature and Environmental Ordinance 19 of 1974, (as amended by the Western Cape Nature Conservation Laws Amendment Act, Act 2 of 2000) defines the protection status of plants as follows: * <b>"endangered flora"</b> means flora of any species which is in danger of extinction and is specified in Schedule 3 or Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, 1973; provided that it shall not include flora	CapeNature	Removal / relocation of protected plant / animal species require a permit to be obtained from CapeNature

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	<p>of any species specified in such Appendix and Schedule 4; (thus all Schedule 3 species)</p> <p>* <b>“protected flora”</b> means any species of flora specified in Schedule 4 or Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, 1973; provided that it shall not include any species of flora specified in such Appendix and Schedule 3</p> <p>» <b>“indigenous unprotected flora”</b> means any species of indigenous flora not specified in Schedule 3 or 4;</p>		
<b>Local Legislation / Policies / Plans</b>			
Western Cape Transportation Amendment Act of 1996	The provincial MEC may grant permit to undertake works within 200m of the published route upon receipt of the report assessing the potential impacts thereof.	Western Cape Department of Public Transport and Community Liaison	Any application for authorisation contemplated in the ECA and NEMA in respect of a 200m area on either side of a published route determination for a provincial road must be accompanied by a report that addresses the issues listed in that section of the Act.
Cape Town Spatial Development Framework, 2012	The development will occur within areas identified within this plan	City of Cape Town	The proposed development will have to ensure compliance with the requirements set out in the framework.
Blaauwberg District Plan	The development will occur within areas identified within this plan	City of Cape Town	The proposed development will have to ensure compliance with the requirements

<b>Legislation</b>	<b>Applicable Requirements</b>	<b>Relevant Authority</b>	<b>Compliance requirements</b>
			set out in the district plan.
City of Cape Town Integrated Development Plan (2012-2017)	The development will occur within areas identified within this plan	City of Cape Town	The proposed development will have to ensure compliance with the requirements set out in the development plan.

**APPENDIX D:  
WALK THROUGH REPORTS**

**APPENDIX D1:  
HERITAGE REPORT**

**APPENDIX D2:  
AVIFAUNA REPORT**

**APPENDIX D3:  
ECOLOGICAL REPORT**