ENVIRONMENTAL MANAGEMENT PROGRAMME:
CONSTRUCTION OF A 132KV DISTRIBUTION LINE FROM THE EXISTING KLIPHOEK TO THE EXISTING PANBULT SUBSTATION:
MPUMALANGA PROVINCE: MARCH 2013

A PROJECT FOR: ESKOM DISTRIBUTION

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Eskom Distribution

Proposal Name:
Environmental Management Programme: Construction of a 132kV Distribution Line from the existing Kliphoek to the existing Panbult Station: Mpumalanga Province

RHDHV Environmental Reference Number:
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Compiled by:
Melissa Naidoo

Date:
January 2014

Location:
Mpumalanga

Reviewer:
Signature

Approval:
Signature
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ENVIRONMENTAL MANAGEMENT PROGRAMME:
A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life cycle of a project. This EMP focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.

ENVIRONMENT:
In terms of the National Environmental Management Act (NEMA) (No 107 of 1998), “environment” means 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) of (ii) and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

ENVIRONMENTAL CONTROL OFFICER:
An individual nominated through the Project Manager to be present on site to act on behalf of the Project Manager in matters concerning the implementation and day to day monitoring of the EMP. The Environmental Control Officer is assumed to be the regional Environmental Practitioner appointed by Eskom.

CONTRACTOR:
A person or company appointed by Eskom to carry out stipulated activities.

ENVIRONMENTAL IMPACT:
A change to the environment, whether adverse or beneficial, wholly or partially, resulting from an organisation’s activities, products or services.

INCIDENT:
An undesired event which may result in a significant environmental impact but can be managed through internal response.

EMERGENCY:
An undesired event that does result in a significant environmental impact and requires the notification of the relevant statutory body, such as a local authority.
1 INTRODUCTION

The proposed project entails the consideration of best environmental practicable 100 m wide corridor (measured 50 m on either side of a proposed powerline alignment) for purposes of constructing a 132kV (kilovolt) distribution powerline within such corridor. The powerline will extend over (approximately) a 20-38 km distance connecting the Kliphoek substation to the Panbult Substation, (see Figure 1 Locality Plan). Three (3) corridor alternatives with an associated powerline alignment are being considered by Eskom Distribution for both Kliphoek to Panbult, and have been evaluated during the Basic Assessment Process to determine the best environmentally practicable alignment.

FIGURE 1: LOCALITY MAP

1.1 Project Description

Eskom proposes the development of a 132kV distribution line that will be constructed from the existing Panbult substation to the existing Kliphoek substation which is needed for back-feeding and improving the voltage levels of the Normandie-Kemp 88kV Network.

The proposed project entails the consideration of a best practice 100 m wide corridor (measured 50 m on either side of a proposed powerline alignment) for purposes of constructing a 132 kV distribution powerline within such corridor. The powerline will extend over (approximately) a 20-38 km distance connecting the Kliphoek substation to the Panbult Substation respectively (see Figure 1: Locality Plan). Three (3) corridor alternatives are being considered by Eskom Distribution and have been evaluated during the Basic Assessment Process to determine the best environmentally suitable alignment.
1.2 Applicable Documentation

The following documentation is applicable for the project, and should be read in conjunction with this EMP:

- Basic Assessment Report for the Proposed Construction of the 132 kV distribution Line between the existing Kliphoek substation to the existing Panbult substation.
- The Environmental Authorisation once issued by the Department of Environmental Affairs (DEA).

1.3 Structure of the EMP

The EMP provides mitigation and management measures for the following key phases of the project:

- **Construction**: This section of the EMP provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required within the construction phase are specified. These specifications will form part of the contract documentation and, therefore, the Contractor (or Contractors, including sub-contractors) will be required to comply with the specifications to the satisfaction of the Project Manager and Environmental Control Officer, in terms of the construction contract.

- **Operations**: This section of the EMP provides management principles for the operational phase of the project. Environmental actions, procedures and responsibilities within the operation and maintenance phases are specified.

- **Decommissioning**: This brief section includes principles for the decommissioning phase of the project. This section of the EMP will be required to be revised and updated at the time of decommissioning.

**FIGURE 2: DIFFERENT PHASES OF THE PROJECT LIFE-CYCLE**

All relevant environmental legislation pertaining to the project from cradle to grave is listed within Appendix B. The Contractor is required to comply with this legislation for all phases of the project. This list is intended to serve as a guideline only for the Contractor and is not exhaustive. Additional aspects should be added once the Authorisation is obtained and amended as construction commences.

It should be noted that this EMP is a dynamic document which should be updated as required on a continuous basis. This may be of particular importance once the final route alignment within the preferred corridor and the exact positioning of the towers has been selected, as at this stage it may be possible to add more ‘site specific’ management measures. Any amendments made must be submitted to the Environmental Control Officer, the Project Manager and the Competent Authority (DEA) for approval prior to implementation.

1.4 Objective of the EMP

The EMP has the following objectives:

- To outline functions and responsibilities of responsible persons;
- To state standards and guidelines, which are required to be achieved in terms of environmental legislation;
- To outline mitigation measures and environmental specifications, which are required to be implemented for all phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts; and
- To prevent long-term or permanent environmental degradation.

An independent Environmental Control Officer (ECO) must be appointed (by the proponent: Eskom) to ensure compliance with the EMP. The EMP will be considered an extension of the Conditions of
Approval as set forth by the Department of Environmental Affairs. Non-compliance with the EMP will constitute non-compliance with said Conditions.

The EMP is binding on all contractors operating on the site.

It should be noted that in terms of the National Environmental Management Act No 107 of 1998 “NEMA” (Section 28) those responsible for environmental damage must pay the costs both to the environment and human health and the preventative measures to reduce or prevent further pollution and/or environmental damage. (The “polluter pays” principle).

1.5 Details of the Environmental Assessment Practitioner

<table>
<thead>
<tr>
<th>Consultant:</th>
<th>Royal HaskoningDHV</th>
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</thead>
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<tr>
<td>Contact Person:</td>
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<tr>
<td>Expertise:</td>
<td>Melissa Naidoo is a Senior Environmental Consultant who has her Honours in Environmental Management and Earth Sciences with experience in Environmental Impact Assessments, Environmental Management plans, GIS, Water Quality Assessments and Public Participation. Melissa has compiled various amendment applications of environmental authorisations for the Gautrain, compiled Water Use Licenses, provided GIS support and managed the Public Participation Process for projects. Ms Naidoo is also a member of the South African Affiliate of the International Association for Impact Assessors.</td>
</tr>
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</table>
2 MANAGEMENT PROCEDURES

The EMP has a long-term objective to ensure that:
- Environmental management conditions and requirements are implemented from the project inception,
- Precautions against damage and claims arising from damage are taken timeously, and
- The completion date of the contract is not delayed due to problems with landowners arising during the course of construction.

Eskom requires a commitment from the Eskom Project Manager and the Contractor on the following issues:
- To underwrite Eskom Transmission 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.

2.1 Functions and Responsibilities

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Project Manager, Environmental Control Officer (ECO) and Contractor for this project are as detailed below.

The Project Manager will:
- Be fully conversant with the Basic Assessment Report for the project, the conditions of the Environmental Authorisation (once issued), and all relevant environmental legislation.
- Be familiar with the recommendations and mitigation measures of this EMP, and enforce these measures.
- Ensure that all stipulations within the EMP are communicated and adhered to the appointed Contractor(s).
- Monitor site activities on a daily basis for compliance.
- Conduct internal audits of the construction site against the EMP.
- Confine construction site to the demarcated area.
- Rectify transgressions through the implementation of corrective action.

The Environmental Control Officer will:
The Environmental Control Officer is responsible for the implementation of the EMP during the construction phase as well as liaison and reporting to Eskom, Contractor, Landowners and Authorities. The following tasks will fall within his / her responsibilities:
- Be familiar with the recommendations and mitigation measures of this EMP
- Conduct monitoring of the construction site according to the EMP
- Educate the construction team about the management measures of the EMP
- Regular liaison with the construction team and the project manager.
- Recommend corrective action for any environmental non-compliance incidents on the construction site.
- Compile a regular report highlighting any non-compliance issues as well as good compliance with the EMP
- All negotiations for any reason shall be between the ECO, Eskom Holdings Limited, affected parties (landowners) and the Contractor. No verbal agreements shall be made.
- All agreements shall be recorded in writing and all parties shall co-sign the documentation.
- The affected parties shall always be kept informed about any changes to the construction programme should they be involved. If the ECO is not on site the Contractor should keep the affected parties informed. The contact numbers of the Contractor and the ECO shall be made
available to the affected parties. This will ensure open channels of communication and prompt response to queries and claims.

**Contractors and Service Providers:**
All contractors (including subcontractors and staff) and service providers are ultimately responsible for:
- Complying with the environmental management specifications.
- Submitting Methods Statement for approval by the ECO before any work is undertaken.
- Adhering to any instructions issued by the Project Manager on the advice of the ECO.
- Submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting.
- Displaying the list of transgressions issued by the ECO in the site office.
- Maintaining a public complaints register.
- Arrange that all his EMPR employees and those of his subcontractors receive training before the commencement of construction in order that they are aware of the terms of reference of the EMPR.

### 2.2 Environmental Awareness Plan
It is important to ensure that all personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental harm. To achieve effective environmental management, it is important that Employees, contractors and sub-contractors are aware of their responsibilities in terms of the relevant environmental legislation and the contents of this EMPR.

The environmental awareness plan is aimed at:
- Promoting environmental awareness amongst all personnel on site;
- Informing personnel of all environmental procedures, policies and programmes applicable;
- Providing generic training on the implementation of environmental management specifications; and
- Providing job-specific environmental training in order to understand the key environmental features of the construction site and the surrounding environment.

The environmental awareness training programme will include:
- The induction of all construction and operation staff;
- Acknowledgement of receiving and understanding the induction must be signed by all persons receiving the induction accordingly;
- Identification of environmental risks and job specific training on addressing these risks; and training on the implementation of emergency procedures (where necessary).

Topics covered by the Environmental Awareness Programme should include:
- What is meant by “Environment”?
- Why the environment needs to be protected and conserved?
- How construction activities can impact on the environment?
- What can be done to mitigate against such impacts?
- Awareness of emergency and spills response provisions.
- Social responsibility during construction of the substation and loop-in lines e.g. being considerate to local residents.

Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. The training must ensure that the contents and requirements of the EMPRR are transferred to the audience. Where training has been done verbally, persons having received training must sign an attendance register (which must be properly filed). Training should be conducted monthly by the ECO and can also be dealt with weekly during the ‘Toolbox Talks’.

### 2.3 Monitoring
A monitoring programme shall be in place not only to ensure compliance with the EMPRR through the contract/work instruction specifications, 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. As part of the contract or work instruction, Eskom shall stipulate the period and frequency of monitoring required. The Project Manager shall ensure that the monitoring is carried out.

The ECO must be appointed to ensure compliance with the EMPR, and to carry out monitoring activities. The ECO will report to the Contractor should any non-compliance be evident or corrective action necessary. Only in severe cases of non-compliance, or repeated offences, will the ECO be required to report to the Project Manager.

2.4 Documentation and Reporting

The following documents must be kept on site in order to record compliance with the EMPRR:

- Record of complaints.
- Monitoring results.
- Non-conformance reports.
- Written corrective action instructions.
- Notification of emergencies and incidents.
- Environmental Authorisation.
3 ENVIRONMENTAL GUIDELINES STANDARDS AND PERMITS

3.1 Environmental Guidelines and Standards

All applicable environmental standards contained within the environmental legislation shall be adhered to. At the time of compiling this draft EMP, the following environmental guidelines and standards were identified as being applicable to the project.

3.1.1 Air Quality Guidelines

In terms of air quality, the Contractor will be required to describe how effective dust control measures will be achieved during the construction phase. This will only be required for activities that are to produce a significant amount of dust or other air pollutants (e.g. excavation activities, use of heavy vehicles during construction, etc.).

3.1.2 Blasting Regulations and Standards

Wherever blasting activity is required on the site, the Contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives. It is, however, unlikely that blasting will be required for this project.

3.1.3 Control of Alien Vegetation

In terms of Government Notice R1048 of the Conservation of Agricultural Resources Act (No 43 of 1983), the following regulations are applicable with regards to the control of invasive alien vegetation and declared weeds:

- It is illegal to have declared weed species or invasive alien vegetation on one’s property.
- The landowner must immediately take steps to eradicate them by using the methods prescribed in the regulations, namely:
  - uprooting and burning, or
  - the application of a suitable chemical weed-killer (herbicide), or
  - any other method of permanent eradication.
- One may not uproot or remove such plants and dump or discard them elsewhere to re-grow or allow their seeds to be spread or blown onto other properties.
- If the landowner does not comply with requirements above, a person may be found guilty of a criminal offence.

3.1.4 Environmental Permitting Requirements

Environmental permits, which will be required to be obtained for construction, are discussed briefly below. These will be required to be obtained before construction commences.

3.1.5 River and Stream Crossings

Permission is required from the Mpumalanga Department of Agriculture, Conservation and environment (MDACE) for the removal of river bank vegetation and disturbance of the river bank itself for all river crossings under the Conservation of Agricultural Resources Act (No 43 of 1983). All disturbances will have to be appropriately rehabilitated. The positioning of the towers have not been determined as yet, and therefore the permit may or may not be required, depending on whether any of the towers are located adjacent to any non perennial river. It is recommended that the banks of the watercourse be avoided wherever possible, rather than obtaining a permit in order to minimise the impact on the watercourse.
It should be noted that pollution of river water (silt-laden run-off, oil from machines etc.) is a contravention of the National Water Act (No 36 of 1998) and is not permitted. Therefore, this must be avoided at all times during construction and maintenance activities.

3.1.6 Abstraction of Water
If water is to be abstracted from a public stream during construction (for construction activities), a permit is required from the Minister of Water Affairs. If water is to be abstracted from water of which the rights of use belong to private landowners, it will be necessary to establish whether their water use rights are still valid in terms of the provisions of the National Water Act. If they are still valid then negotiations with the relevant landowners has to be undertaken and a water use permit obtain from DWA in terms of Section 21, 40 and 41 of the National Water Act (No 36 of 1998).

3.1.7 Heritage Sites
In terms of the National Heritage Resources Act (No 25 of 1999), a permit is required to be obtained for the disturbance, removal or destruction of any national and provincial heritage sites, archaeological and paleontological sites, burial grounds and graves and public monuments and memorials. The demolition or dismantling of all man-made structures and buildings older than 60 years is subject to the approval of the relevant provincial heritage council under the National Heritage Council Act (No 11 of 1999).

3.1.8 Waste Disposal
All waste (general and hazardous) generated during the construction of the powerline and substation may only be disposed of at appropriately licensed waste disposal sites (in terms of Section 25 of the National Waste Act (No 59 of 2008) however every attempt must be made to reduce, recycle or re-use all waste before it is disposed off in terms of section 17 of the National Waste Act (59 of 2008). Cognisance must also be taken of the relevant provincial legislation in this regard.

3.1.9 Occupational Health and Safety
All safety, health and environmental standards and emergency procedures in terms of the Occupational Health and Safety Act (No 85 of 1993), must be complied with during the construction and operation.
## 4 EMPRR: PLANNING AND DESIGN PHASE

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<th>ASPECT / IMPACT</th>
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<tr>
<td><strong>FLORA</strong></td>
<td>1. General mitigation measures would include the avoidance of any physical damage to natural vegetation on the periphery of the proposed servitude and is of particular importance in all riparian areas and areas of steep slopes.</td>
<td>Project Manager, Engineering Team</td>
</tr>
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</table>
| **HERITAGE**    | 1. A full phase 2 archaeological survey must be undertaken once an approved route has bee selected.  
2. All sites of archaeological significance must be clearing demarcated prior to construction. | Project Manager, Engineering Team |
| **WETLANDS**    | 1. A walkthrough of the selected alternative must be undertaken prior to construction to avoid all sensitive areas.  
2. Pylons must be relocated if with a watercourse or drainage line. | Project Manager, Engineering Team |
<p>| <strong>AVI FAUNA</strong>   | 1. A pre-construction ‘walk-down’ of the lines by an avifauna specialist is recommended to confirm the spans on which marking devices are required to be placed, as described above. The walk-down will also be used to identify sensitive areas, and to input span-specific / area-specific mitigation measures into the construction EMPr. | Project Manager, Engineering Team |
| <strong>ACCESS ROADS</strong>| 1. Temporary access and haulage routes must be designed prior to construction commencing to ensure that the most preferable access and haulage routes for each tower site has been identified. Use should be made of existing roads as far as possible. | Project Manager, Engineering Team |</p>
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<td>slopes, rocky outcrops, etc.)</td>
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5 EMPRR: CONSTRUCTION PHASE

5.1 Site Clearing
Site clearing must take place in phased manner, as and when required. Areas which are not to be maintained within two months of time must not be cleared to reduce erosion risks. The area to be cleared must be clearly demarcated and this footprint strictly maintained. Spoil that is removed from the site must be removed to an approved spoil site or DWA licensed landfill site. The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent - these include steep areas.

5.2 Site Establishment
Site establishment shall take place in an orderly manner and all required amenities shall be installed at the camp site before the main workforce move onto site. The construction camp shall have the necessary ablution facilities at the commencement of construction activities. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed other than in supplied facilities.

The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at a licensed landfill site. A certificate of disposal shall be obtained by the Contractor and kept on file. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. The disposal of waste shall be in accordance with all relevant legislation. Under no circumstances may solid waste be burnt on site.
### 5.3 Construction Traffic and Access

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<tr>
<td><strong>CONSTRUCTION TRAFFIC AND ACCESS</strong>&lt;br&gt;Impact that construction traffic and access has on the site and surrounds</td>
<td><strong>Construction traffic</strong>&lt;br&gt;1. Construction routes must be clearly defined.&lt;br&gt;2. Access of all construction and material delivery vehicles should be strictly controlled, especially during wet weather to avoid compaction and damage to the topsoil structure.&lt;br&gt;3. Wheel washing and damping down of un-surfaced roads must be implemented to reduce dust.&lt;br&gt;4. Vehicles and equipment shall be serviced regularly to avoid the contamination of soil from oil and hydraulic fluid leaks etc.&lt;br&gt;5. Servicing must be done off-site.&lt;br&gt;6. Oil changes must take place on a concrete platform or on a drip tray.&lt;br&gt;7. Soils compacted by construction shall be deep ripped to loosen compacted layers and re-graded to even running levels.</td>
<td>Main Contractor, ECO</td>
<td>Weekly</td>
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<tr>
<td><strong>Access</strong>&lt;br&gt;Impact that construction traffic and access has on the site and surrounds</td>
<td>1. Temporary access roads that might be required must be rehabilitated prior to the Contractor leaving the site.&lt;br&gt;2. Strategic positioning of entry and exit points to ensure as little impact/effect as possible on the traffic flow.&lt;br&gt;3. The main routes to the site must be clearly signposted.</td>
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<tr>
<td><strong>Road maintenance</strong>&lt;br&gt;Impact that construction traffic and access has on the site and surrounds</td>
<td>1. Contractors should ensure that access roads are maintained in good condition by attending to potholes, corrugations and stormwater damage as soon as these develop.&lt;br&gt;2. If necessary, staff must be Employed to clean surfaced roads adjacent to construction sites where materials have spilt.</td>
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### General

1. The Contractor shall meet safety requirements under all circumstances. All equipment transported shall be clearly labelled as to their potential hazards according to specifications. All the required safety labelling on the containers and trucks used shall be in place.
2. The Contractor shall meet these safety requirements under all circumstances. All equipment transported shall be clearly labelled as to their potential hazards according to specifications. All the required safety labelling on the containers and trucks used shall be in place.
3. The Contractor shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken in the event of an accident.

### 5.4 Construction Camp

#### Site of construction camp

1. Choice of site for the Contractor’s camp requires the ECO’s permission and must take into account location of local residents and/or ecologically sensitive areas, including flood zones and slip/unstable zones. A site plan must be submitted to the ECO and project manager for approval.
2. The construction camp may not be situated within the 1:100 year flood line or on slopes greater than 1:3.
3. If the Contractor chooses to locate the camp site on private land, he must get prior permission from both the project manager and the landowner.
4. The size of the construction camp should be minimized (especially where natural vegetation or grassland has had to be cleared for its
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|                | construction).  
5. The Contractor must attend to drainage of the camp site to avoid standing water and/or sheet erosion.  
6. Suitable control measures over the Contractor’s yard, plant and material storage to mitigate any visual impact of the construction activity must be implemented.  
7. No development, or activity of any sort associated with camp, is allowed below the 1:100 year flood line of any water system. |

**Storage of materials (including hazardous materials)**  
1. Choice of location for storage areas must take into account prevailing winds, distances to water bodies, general on site topography and water erosion potential of the soil.  
2. Storage areas must be designated, demarcated and fenced.  
3. Storage areas should be secure so as to minimize the risk of crime. They should also be safe from access by unauthorised persons.  
4. Fire prevention facilities must be present at all storage facilities.  
5. Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage area(s). These pollution prevention measures for storage should include a bund wall high enough to contain at least 110% of any stored volume, and this should be sited away from drainage lines in a site with the approval of the ECO.  
6. These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.  
7. Clear signage must be placed at all storage areas containing hazardous substances/materials.  
8. Staff dealing with these materials/substances must be aware of their potential impacts and follow the appropriate safety measures.  
9. A Waste Disposal Contractor must be Employed to remove waste oil. These wastes should only be disposed of at a licensed landfill sites |


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<tr>
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<th>RESPONSIBILITY</th>
<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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</thead>
<tbody>
<tr>
<td>Designed to handle hazardous wastes. A disposal certificate must be obtained from the Waste Disposal Contractor.</td>
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<td>10. The Contractor must ensure that its staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training.</td>
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<tr>
<td>11. All excess cement and concrete mixes are to be contained on the construction site prior to disposal off site.</td>
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<td>12. Any spillage, which may occur, shall be investigated and immediate action must be taken. This must also be reported to the ECO and DEA, as well as local authorities if so required.</td>
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</table>

**Drainage of construction camp**

1. Run-off from the camp site must not discharge into neighbours’ properties or into adjacent wetlands, rivers or streams.

**End of construction**

1. Once construction has been completed on site and all excess material has been removed, the storage area shall be rehabilitated. If the area was badly damaged, re-seeding shall be done.
2. Such areas shall be rehabilitated to their natural state. Any spilled concrete shall be removed and soil compacted during construction shall be ripped, levelled and re-vegetated.
3. Only designated areas must be used for storage of construction materials, soil stockpiles, machinery and other equipment.
4. Specific areas must be designated for cement batching plants. Sufficient drainage for these plants must be in place to ensure that soils do not become contaminated.
5. The construction camp must be kept clear of litter at all times.
6. Spillages within the construction camp need to be cleaned up immediately and disposed of in the hazardous skip bin for correct disposal.
7. No open fires are allowed within the construction camp and no wood from surrounding vegetation may be used to create a fire.
5.5 Soils

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<tr>
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<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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</thead>
<tbody>
<tr>
<td><strong>SOILS</strong></td>
<td>Impact that construction activities will have on soil</td>
<td><strong>Topsoil</strong></td>
<td>Main Contractor, ECO</td>
</tr>
<tr>
<td></td>
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<td>1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas.</td>
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<td>2. Care must be taken not to mix topsoil and subsoil during stripping.</td>
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<td>3. Removed polluted topsoil should be transported to a licensed landfill site.</td>
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<td>4. Remove and store topsoil separately in areas where excavation/degradation takes place. Topsoil should be used for rehabilitation purposes in order to facilitate re-growth of species that occur naturally in the area.</td>
<td></td>
</tr>
<tr>
<td><strong>Soil stripping</strong></td>
<td>1. No soil stripping must take place on areas within the site that the Contractor does not require for construction works or areas of retained vegetation.</td>
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<td>2. Subsoil and overburden should, in all construction and lay down areas, be stockpiled separately to be returned for backfilling in the correct soil horizon order.</td>
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<td></td>
<td>3. Construction vehicles must only be allowed to utilise existing tracks or pre-planned access routes.</td>
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<tr>
<td><strong>Erosion:</strong></td>
<td>1. Limit construction-, maintenance- and inspection activities to dry periods in order to curb occurrence/ augmentation of erosion in areas of existing erosion.</td>
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<td>2. No vehicles should be allowed to cross rivers or streams in any area</td>
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| other than an approved crossing, taking care to prevent any impact (particularly erosion) in a surrounding habitat.
**Stockpiles**
1. Stockpiles should not be situated such that they obstruct natural water pathways and drainage channels.
2. Stockpiles should not exceed 2 m in height.
3. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or cloth. Stockpiles may further be protected by the construction of berms or low brick walls around their bases.
4. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding.
5. Where contamination of soil is expected, analysis must be done prior to disposal of excess soil to determine the appropriate disposal route.

**Fuel storage**
1. Topsoil and subsoil to be protected from contamination.
2. Fuel and material storage must be away from stockpiles.
3. Cement, concrete and chemicals must be mixed on an impermeable surface and provisions should be made to contain spillages or overflows into the soil.
4. Any storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.
5. Contaminated soil must be contained and disposed of off site at an approved landfill site.

**Concrete mixing (if required)**
1. Concrete mixing must only take place within designated areas.
2. Ready mixed concrete must be utilised where possible.
3. No vehicles transporting concrete to the site may be washed on site.
4. If a batching plant is necessary, run-off should be managed effectively
### 5.6 Groundwater Pollution

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<tr>
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<tbody>
<tr>
<td>GROUNDWATER POLLUTION</td>
<td><strong>Sanitation</strong>&lt;br&gt;1. Adequate sanitary facilities and ablutions must be provided for construction workers&lt;br&gt;2. The facilities must be regularly serviced and emptied to reduce the risk of surface or groundwater pollution.</td>
<td>Main Contractor, ECO</td>
<td>Weekly</td>
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<tr>
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<td><strong>Hazardous materials</strong>&lt;br&gt;1. Use and or storage of materials, fuels and chemicals which could potentially leak into the groundwater must be controlled.&lt;br&gt;2. All storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund wall must be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential stormwater events.&lt;br&gt;3. Any hazardous substances must be stored at least 20 m from any of the existing groundwaters.</td>
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<td>ASPECT / IMPACT</td>
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| the water bodies on site.  
4. The Environmental Control Officer should be responsible for ensuring that potentially harmful materials are properly stored in a dry, secure, ventilated environment, with concrete or sealed flooring and a means of preventing unauthorised entry.  
5. Contaminated wastewater must be managed by the Contractor to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp shall be collected and removed from the site for appropriate disposal at a licensed commercial facility. |                |                      |
| Cement mixing | 1. Cement contaminated water must not enter the water system as this disturbs the natural acidity of the soil and affects plant growth.                                                                                                                                 |                |                      |
| Public areas  | 1. Food preparation areas should be provided at the construction camp with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis.  
2. The Contractor should take steps to ensure that littering by construction workers does not occur and persons should be Employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.  
3. No washing or servicing of vehicles on site.                                                                                                                                 |                |                      |
| Water resources | 1. Site staff shall not be permitted to use any other open water body or natural water source adjacent to or within the designated site for the purposes of bathing, washing of clothing or for any construction or related activities.  
2. Municipal water (or another source approved by the ECO) should instead be used for all activities such as washing of equipment or |                |                      |
### 5.7 Hydrology and Stormwater

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<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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</table>
| HYDROLOGY AND STORMWATER Impact that construction activities could have on hydrology | 1. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants.  
2. Silt fences should be used to prevent any soil entering the stormwater drains.  
3. Temporary cut of drains and berms may be required to capture stormwater and promote infiltration.  
4. Promote water saving mind set with construction workers in order to ensure less water wastage.  
5. New stormwater infrastructure construction must be developed strictly according to specifications from ECO in order to ensure efficiency.  
6. Hazardous substances must be stored at least 20 m away from the buffer area surrounding any water bodies on site to avoid pollution.  
7. The installation of the stormwater system must take place as soon as possible after commencement of the construction activities, to attenuate stormwater from the construction as well as the operational phase.  
8. Earth, stone and rubble is to be properly disposed of so as not to obstruct natural water path ways over the site. (i.e. these materials must not be placed in stormwater channels, drainage lines or rivers). | ECO, Main Contractor | Weekly |

- disposal of any type of waste, dust suppression, concrete mixing, compacting, etc.  
- The Department of Water Affairs and the ECO as well as other Emergency contact numbers provided by the Municipality should be contacted in order to deal with spillages and contamination of aquatic environments.
5.8 Air Quality

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<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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<tbody>
<tr>
<td>AIR POLLUTION</td>
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<tr>
<td>Vehicle activities associated with the transport of equipment to the site; preparation of the surface areas which may be required prior to the set up of new infrastructure; and the removal of construction equipment from site after the set up of new equipment</td>
<td>Dust control</td>
<td>Main Contractor, ECO</td>
<td>Daily</td>
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- **Dust control**
  1. Frequent and effective dust-suppression is advised, particularly along dirt roads. Dust must be suppressed on the construction site during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of run-off.
  2. Retention of vegetation where possible will reduce dust travel.
  3. Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.
  4. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the landowner or neighbouring communities.
  5. A speed limit of 30 km/h must not be exceeded on dirty roads (if any).
  6. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.
### Odour control
1. Regular servicing of vehicles in order to limit gaseous emissions (to be done off-site).
2. Regular servicing of on site toilets to avoid potential odours.
3. Allocated cooking areas must be provided.
4. The Contractor must make alternative arrangements (other than fires) for cooking and / or heating requirements. LP gas cookers may be used provided that all safety regulations are followed.

### Rehabilitation
1. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks.

### Fire prevention
1. The Contractor must ensure that any grass left in a natural state during the construction of a sub-transmission should be cut in order to prevent veld fires, especially during the dry months.
2. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.
3. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of fire fighting equipment must be assessed and evaluated thorough a typical risk assessment process. It may be required to increase the level of protection, especially during the winter months.
5.9 Noise

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<th>RESPONSIBILITY</th>
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<td>NOISE</td>
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<td>Main Contractor, ECO</td>
<td>Daily</td>
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<tr>
<td>Construction activities (excavating and site clearing); construction vehicles; and construction staff</td>
<td>1. The construction phase must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of residential areas in close proximity to the development.</td>
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<td></td>
<td>2. Construction site yards, workshops, and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed into the system.</td>
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<td>3. Truck traffic should be routed away from noise sensitive areas, where possible.</td>
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<td>4. Noise levels must be kept within acceptable limits.</td>
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<td>5. Noisy operations should be combined so that they occur where possible at the same time.</td>
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<td>6. Blasting operations (if required) are to be strictly controlled with regard to the size of explosive charge in order to minimise noise and air blast, and timings of explosions. The number of blasts per day should be limited, blasting should be undertaken at the same times each day and no blasting should be allowed at night.</td>
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<td>7. Construction activities are to be contained to reasonable hours during the day and early evening. Night-time activities near noise sensitive areas should not be allowed.</td>
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<td>8. With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the Contractor and ECO should liaise with local residents on how best to minimise impact, and the local population should be kept informed of the nature and duration of intended activities.</td>
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<td>9. As construction workers operate in a very noisy environment, it must be ensured that their working conditions comply with the requirements of the Occupational Health and Safety Act (Act No 85 of 1993). Where necessary ear protection gear should be worn.</td>
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<td>10. Noisy activities to take place during allocated construction hours only as per section 25 of the Noise Control Regulations of the Environment</td>
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<td>ASPECT / IMPACT</td>
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|                | **Conservation Act, 1989 (Act No. 73 of 1989)**  
11. Noise from labourers must be controlled.  
12. Noise suppression measures must be applied to all construction equipment. Construction equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from site.  
13. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. |                |                                    |

5.10 Flora

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<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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| FLORA          | **Impacts on flora relating to the destruction of threatened and protected flora species and destruction of sensitive pristine habitat types**  
1. Conduct a pre-construction walk-down of the approved corridor in order to mark and geo-reference all protected tree species within the servitudes and development areas. Submit relevant applications for impacts on these individuals.  
2. Should impacts on protected tree individuals be unavoidable, obtain necessary and required approval per application for damage/ removal/ cutting/ pruning of protected tree species from Department of Forestry, as per National Forests Act (Act No. 84 of 1998) under Government Notice GN 1012 of 2004 and GN 767 of 2005.  
3. Marking should be done by means of semi-permanent (removable) marker tape.  
4. Cutting/ pruning/ damaging of any protected tree species should not be | ECO            | Weekly                              |
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<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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<td>allowed under any circumstances without proper approval.</td>
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<td>5.</td>
<td>Removal of vegetation/plants shall be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible.</td>
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<td>6.</td>
<td>Disturbance of vegetation must be limited to areas of construction.</td>
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<td>7.</td>
<td>The Eskom Standard for Bush Clearing (Appendix C) should be adhered to.</td>
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<td>8.</td>
<td>The removal or picking of any protected or unprotected plants shall not be permitted and no horticultural specimens (even within the demarcated working area) shall be removed, damaged or tampered with unless agreed to by the ECO.</td>
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<td>9.</td>
<td>Use of branches of trees and shrubs for fire making purposes is strictly prohibited.</td>
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<td>10.</td>
<td>The establishment and re-growth of alien vegetation must be controlled after the removal of grass.</td>
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<tr>
<td>11.</td>
<td>All declared aliens must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), namely:</td>
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<td>• Uprooting, felling or cutting;</td>
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<td>• Treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer;</td>
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<td>• The application of control measures regarding the utilisation and protection of veld in terms of regulation 9 of the Act;</td>
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<td></td>
<td>• The application of control measures regarding livestock reduction or removal of animals in terms of regulations 10 and 11 of the Act;</td>
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<td>• Any other method or strategy that may be applicable and that is specified by the executive officer by means of a directive.</td>
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<td>12.</td>
<td>According to the Conservation of Agricultural Resource Act (No. 43 of 1983) as amended, the person applying herbicide must be adequately qualified and certified as well as registered with the appropriate authority to apply herbicides.</td>
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<td>13.</td>
<td>Monitoring the potential spread of declared weeds and invasive alien vegetation to neighbouring land and protecting the agricultural resources and soil conservation works are regulated by the</td>
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5.11 Avifauna

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<th>ASPECT / IMPACT</th>
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<tbody>
<tr>
<td>AVIFAUNA</td>
<td>Impact on birds breeding, foraging and roosting in or in close proximity of the site, through the modification of habitat</td>
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<tr>
<td></td>
<td>1. The study area is equally spread of Eastern Highveld Grassland (Gm 12) and Wakkerstroom Montane Grassland (Gm 14) as well as Eastern Temperate Freshwater Wetlands (AZf 3) (Mucina &amp; Rutherford 2006).</td>
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<tr>
<td></td>
<td>2. Eastern Highveld Grassland is very suitable for crop production, with the natural vegetation heavily used for grazing of sheep and cattle. The conservation status of this vegetation type is very poor and is listed as Endangered with only a fraction conserved. Moist Sandy Highveld Grassland is now largely ploughed, with natural vegetation restricted to patchy remnants, which are often heavily grazed. The Nooitgedacht Dam Nature Reserve and Jericho Dam Nature Reserves are the only official statutory conservation areas of this vegetation type as well as private reserves (Holkranse, Kransbank, Morgenstond). Some 44% is transformed primarily by cultivation, plantations and mines, urbanisation and by building of dams. Cultivation may have had a more extensive impact, indicated by land-cover. Wakkerstroom Montane Grassland is classified at Least-Threatened with a conservation target of 27%. Provides important habitat for certain threatened faunal species including Southern Bald Ibis.</td>
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<td></td>
<td>3. The extent of the construction site should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance), and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the construction site that are not part of the</td>
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Environmental Management Programme: Construction of a 132kV Distribution Line from the existing Kliphoek to the existing Panbult Station: Mpumalanga Province

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<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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<tr>
<td>demarcated development area should be considered as “no-go” areas for Employees, machinery or even visitors;</td>
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<tr>
<td>4. Construction should commence during December to April when the target bird species are not engaged in breeding activities;</td>
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<td>5. Bird guards should be fitted to all the tower structures; and</td>
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5.12 Wetlands

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<th>RESPONSIBILITY</th>
<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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<tbody>
<tr>
<td>WETLANDS</td>
<td>Runoff from the tower construction and assembly sites and the access/haulage routes must be controlled during the construction phase and any erosion associated with construction disturbances must remediated immediately.</td>
<td>Main Contractor, ECO</td>
<td>Weekly</td>
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<tr>
<td></td>
<td>The tower construction and assembly areas and access/haulage routes must be reduced to a minimum size and should be cordoned off using snow fencing and all areas outside these areas considered no-go areas.</td>
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<td>All areas cleared during the construction phase must be re-grassed using deep rooted indigenous vegetation. If the re-grassing takes place in winter, the grassed area will need to be irrigated regularly.</td>
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<td></td>
<td>Provision of adequate stormwater measures and controls during construction.</td>
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<td></td>
<td>The establishment and re-growth of alien vegetation must be controlled after the removal of grass. All declared aliens must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No.43 of 1983).</td>
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<td></td>
<td>Avoid driving on drainage line soils during construction of the powerline. The significance of the impact without mitigation is regarded as low, as identified drainage lines are typically dominated by sandy soils with limited opportunity for compaction.</td>
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</table>
### 7. No refuelling of construction vehicles should occur within 30 m of drainage lines. Hydrocarbons should not be stored within 30 m of drainage lines.

7. No refuelling of construction vehicles should occur within 30 m of drainage lines. Hydrocarbons should not be stored within 30 m of drainage lines.

8. No pylons should be constructed within any of the drainage lines (i.e. A Section channels, washes and inter-dune depressions).

9. Construction of access or maintenance road crossings should not be made through drainage lines. Where this is unavoidable only temporary structures should be used that will be removed at the end of the construction phase. Temporary crossing structures should not concentrate surface flows in such a manner that they pose a risk to scour or headcut formation.

10. If the construction of a crossing is unavoidable make sure that substrate continuity is maintained between the drainage line surfaces up and downstream.

### 5.13 Waste Management

#### Waste Management

<table>
<thead>
<tr>
<th>ASPECT / IMPACT</th>
<th>MITIGATION</th>
<th>RESPONSIBILITY</th>
<th>FREQUENCY / MONITORING REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WASTE MANAGEMENT</strong></td>
<td><strong>Construction rubble</strong>&lt;br&gt;1. Construction rubble shall be disposed of in pre-agreed, demarcated spoil dumps that have been approved by the relevant Municipality.</td>
<td>Main Contractor, ECO</td>
<td>Weekly</td>
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<tr>
<td></td>
<td><strong>Litter management</strong>&lt;br&gt;1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site.</td>
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<td></td>
<td>2. A housekeeping team should be appointed to regularly maintain the litter and rubble situation on the construction site.</td>
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<td></td>
<td>3. If possible and feasible, all waste generated on site must be separated</td>
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</table>
### ASPECT / IMPACT

### MITIGATION

- **Recycling**
  - Into glass, plastic, paper, metal and wood and recycled. An independent Contractor can be appointed to conduct this recycling.

- **Littering**
  - Littering by the Employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite.

- **Waste Containers**
  - Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly from the site by the local council.

- **Waste Disposal**
  - All waste must be removed from the site and transported to a landfill site as approved by the relevant Municipality.

- **Waybills**
  - Waybills providing disposal at each site shall be provided to the ECO’s inspection.

### Hazardous waste

1. All waste hazardous materials must either be stored in a bunded or lined area or as otherwise advised by the ECO, and then disposed off at a licensed landfill site by a reputable third party waste Contractor. Hazardous waste may not be stored on site in excess of a 90 calendar day period.

2. Contaminants to be stored safely to avoid spillage.

3. Machinery must be properly maintained to keep oil leaks in check.

4. Labelled containers must be provided to store used oils, as well as hazardous waste containers for oily rags, oil filters etc. and must be disposed of at a suitable approved register dumpsite.

### Sanitation

1. The Contractor shall install mobile chemical toilets on the site.

2. No indiscriminate sanitary activities on site shall be allowed.

3. Ablution facilities shall be within 100 m from workplaces but not closer than 50 m from any natural water bodies or boreholes. There should be enough toilets available to accommodate the workforce. Male and females must be accommodated separately where possible.

4. Toilets should be no closer than 100 m or above the 1:100 year flood
line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the ECO.

5. Potable water must be provided for all construction staff.

**Remedial actions**

1. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.
2. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.
3. The ECO must determine the precise method of treatment of polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.
4. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent materials.
5. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.
6. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.
7. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.
## 5.14 Health and Safety

<table>
<thead>
<tr>
<th>ASPECT / IMPACT</th>
<th>MITIGATION</th>
<th>RESPONSIBILITY</th>
<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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</thead>
</table>
| HEALTH AND SAFETY (Safety of workers and the public exposed to construction activity hazards) | **Worker safety**  
1. Implementation of safety measures, work procedures and first aid must be implemented on site.  
2. A health and safety plan in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) must be drawn up to ensure worker safety.  
3. Workers should be thoroughly trained in using potentially dangerous equipment.  
4. Contractors must ensure that all equipment is maintained in a safe operating condition.  
5. A safety officer must be appointed.  
6. A record of health and safety incidents must be kept on site.  
7. Any health and safety incidents must be reported to the project manager immediately.  
8. First aid facilities must be available on site at all times.  
9. Workers have the right to refuse work in unsafe conditions.  
10. A record shall be kept of drugs administered or precautions taken and the time and dates when this was done. This can then be used as evidence in court should any claims be instituted against Eskom or Contractor.  
11. The Contractor must ensure that all construction workers are well educated about HIV/ AIDS and the risks surrounding this disease.  
12. Material stockpiles or stacks, such as, pipes must be stable and well secured to avoid collapse and possible injury to site workers.  

**Worker facilities**  
1. Eating areas should be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness.  
2. Fires are not to be allowed.  

**Protective gear**  
1. Personal Protective Equipment (PPE) must be made available to all... | Eskom, Main Contractor, ECO | Daily |
### Site Safety

1. The construction camp must remain fenced for the entire construction period.
2. Potentially hazardous areas such as trenches are to be demarcated and clearly marked.
3. Adequate warning signs of hazardous working areas.
4. Uncovered manholes and excavations must be clearly demarcated.
5. Emergency numbers for local police and fire department etc must be placed in a prominent area.
6. Fire fighting equipment must be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank.
7. Suitable conspicuous warning signs in English and all other applicable languages must be placed at all entrances to the site.
8. All speed limits must be adhered to.

### Hazardous Material Storage

1. Staff that will be handling hazardous materials must be trained to do so.
2. Any hazardous materials (apart from fuel) must be stored within a lockable store with a sealed floor.
3. Storage areas containing hazardous substances / materials must be clearly sign-posted.
4. All storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.
5. For transformer oil containers which may be required to be temporary stored on site for a period of not more than 21-calendar days, the following is proposed:
### Procedure in the event of a petrochemical spill

1. The individual responsible for or who discovers the petrochemical spill must report the incident to the Project Manager, ECO or Contractor.
2. The problem must be assessed and the necessary actions required will be undertaken.
3. The immediate response must be to contain the spill.
4. The source of the spill must be identified, controlled, treated or removed.

### Fire management

1. Fire fighting equipment should be present on site at all times as per Occupational Health and Safety Act 85 of 1993.
2. All construction staff must be trained in fire hazard control and fire fighting techniques.
3. All flammable substances must be stored in dry areas which do not
### 5.15 Security

<table>
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<tr>
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<th>RESPONSIBILITY</th>
<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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</table>
| SECURITY | 1. Access to the construction site should be strictly controlled by a security company.  
2. 24 hour security on-site.  
3. No person shall enter the site unless authorised to do so by the Contractor, project manager and ECO.  
4. If any fencing interferes with the construction process, such fencing shall be deviated until construction is completed. The deviation of fences shall be negotiated and agreed with the landowner in writing.  
5. Trespassing on private / commercial properties adjoining the site is forbidden.  
6. Secure the site in order to reduce the opportunity for criminal activity in the locality of the construction site. | Main Contractor, ECO | Weekly |

### 5.16 Social Environment

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<tr>
<th>ASPECT / IMPACT</th>
<th>MITIGATION</th>
<th>RESPONSIBILITY</th>
<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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</thead>
<tbody>
<tr>
<td>SOCIAL</td>
<td>1. All contact with the affected parties shall be courteous at all times. The rights of the affected parties shall be respected at all times.</td>
<td>Project Manager</td>
<td>Bi-Monthly</td>
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<tr>
<td>ASPECT / IMPACT</td>
<td>MITIGATION</td>
<td>RESPONSIBILITY</td>
<td>FREQUENCY / MONITORING REQUIREMENTS</td>
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<tr>
<td>ENVIRONMENT</td>
<td>Social impacts of construction activities will have on the site and surrounds</td>
<td>2. A complaints register should be kept on site. Details of complaints should be incorporated into the audits as part of the monitoring process. This register is to be tabled during monthly site meetings. 3. No interruptions other than those negotiated shall be allowed to any essential services. Damage to infrastructure shall not be tolerated and any damage shall be rectified immediately by the Contractor. A record of all damage and remedial actions shall be kept on site.</td>
<td>Main Contractor ECO</td>
</tr>
</tbody>
</table>

**Spatial Development**

1. Consult pro-actively with the Khai- Ma Local Municipality on the timing and placement of the substation and turn-in lines.

**Influx of Construction workers**

1. Raise awareness amongst construction workers about local traditions and practices.
2. Inform local businesses that construction workers will move into the area to enable local businesses to plan for the extra demand.
3. Ensure that the local community communicates their expectations of construction workers’ behaviour with them.

**Influx of Job Seekers**

1. Ensure that Employment procedures / policy are communicated to local stakeholders, especially community representative organisations and ward councillors.
2. Have clear rules and regulations for access to the camp / site office to control loitering. Consult with the local SAPS to establish standard operating procedures for the control and/or removal of loiterers at the construction site.
3. Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. Construction workers could also be issued with identification tags.
4. Eskom (or its appointed Contractor) should monitor areas where people gather in the field on a regular basis as this is normally the first
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<td>indication that settlement might take place in the area. These people should be removed in co-operation with the local SAPS to prevent the formation and/or expansion of informal settlements in such an area.</td>
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**Electricity Supply and Economic Growth**

1. Consult with the Khai-Ma Local Municipality on their requirements in terms of capacity required and timeframes.

**Attitude formation against the project**

2. If required, a communication forum should be established with neighbouring residents during the construction period. This forum can meet once a month to discuss any issues and progress on the construction of the substation.
3. Employment opportunities should first be offered to the local community if the skills are available within the community.
4. Eskom or its appointed Contractor(s) should deliver on their undertakings with the community in terms of Employment creation, etc. (tangible benefits to the community).
5. The undertakings in the EMPr should also be implemented effectively and with due diligence.

**Additional demand on Municipal Services**

1. Construction workers should be made aware of the limited capacity of the municipal services network.
2. Sufficient portable chemical toilets should be provided on site.

**Integration with Local Community**

1. The community should be informed in advance of the influx of construction workers and the time they will spend in the community as well as the activities they will be involved in. This will enable the community to prepare for a possible (temporary) change in functioning.
2. A code of conduct should be established for construction workers in their dealings with the local community. Creating of awareness on both
3. Potential conflict situations can be reduced beforehand using a transparent recruitment process, i.e. where labourers would be sourced from the local community.
4. A labour desk should be implemented where the local community members could register. A rotary system could be used for unskilled labour to ensure that all job seekers have an equal opportunity to Employment.
5. Potential conflict situations within the construction village itself can be managed by means of weekly forum meetings. During these meetings residents should have the opportunity to raise any problems experienced and make suggestions in terms of their living space. Where feasible, these problems and suggestions should be addressed as soon as possible to ensure a conflict-free environment.

5.17 Cultural and Heritage Artefacts

1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999)
2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts are uncovered in the affected area.
3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken.
4. Any discovered artefacts shall not be removed under any
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<th>ASPECT / IMPACT</th>
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<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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<tr>
<td>be found in the study are</td>
<td>circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from the South African Heritage Resources.</td>
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<td></td>
<td>5. If anything is noticed, work in that area should be stopped and the occurrence should immediately be reported to a museum, preferably one at which an archaeologist is available. The archaeologist should then investigate and evaluate the find.</td>
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<tr>
<td></td>
<td>6. Any discovered artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits must be obtained from the South African Heritage Resources Agency.</td>
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<td></td>
<td>7. Any mitigation measures applied by an archaeologist, in the sense of excavation and documentation, should be published in order to bring this information into the public domain.</td>
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## 6 EMPRR: OPERATIONAL PHASE

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<thead>
<tr>
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<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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<tbody>
<tr>
<td>ACCESS ROADS</td>
<td><strong>Access roads used for maintenance might impact on vegetation and water bodies</strong>&lt;br&gt;1. Use should be made of existing roads as far as possible, ensuring proper maintenance/upgrade. Alternative methods of construction / access to sensitive areas are recommended.&lt;br&gt;2. No vehicles should be allowed to cross rivers or streams in any area other than an approved crossing, taking care to prevent any impact (particularly erosion) in surrounding habitat.&lt;br&gt;3. Vehicular traffic shall not be allowed in permanently wet areas, no damage shall be caused to wet areas. Where necessary, alternative methods of construction shall be used to avoid damage to wet areas.&lt;br&gt;4. Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act, 1998 (Act No. 36 of 1998), and therefore may well require the application of a Water Use License. Therefore, the Contractor must in consultation with the ECO, assess all areas along the alignment well in advance in order to ensure the relevant Water Use License is applied for where required.</td>
<td>Project Manager</td>
<td>Weekly</td>
</tr>
<tr>
<td>AVIFAUNA</td>
<td><strong>Bird collisions with powerlines and possible bird electrocutions</strong>&lt;br&gt;1. The poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators.&lt;br&gt;2. The sections of the line that will require marking with bird flight diverters are indicted in the Avifaunal Report.</td>
<td>Project Manager</td>
<td>Monthly</td>
</tr>
<tr>
<td>WASTE</td>
<td><strong>Waste generation during the operation phase will have a negative impact on the environment, if not controlled adequately. Waste includes: general waste or hazardous waste (used oil etc.)</strong>&lt;br&gt;1. Where possible, construction waste on site must be reused or recycled.&lt;br&gt;2. Disposal of waste must be in accordance with relevant legislative requirements.&lt;br&gt;3. The Contractor must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation.&lt;br&gt;4. Burning of waste material will not be permitted.</td>
<td>Project Manager</td>
<td>Weekly</td>
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<tr>
<td>ASPECT / IMPACT</td>
<td>MITIGATION</td>
<td>RESPONSIBILITY</td>
<td>FREQUENCY / MONITORING REQUIREMENTS</td>
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<tr>
<td>ELECTROMAGNETIC FIELDS</td>
<td>1. In general, it is not recommended that humans should live under power lines due to the effects of EMF. However, the radiation decreases with an increase in distance from the source. The EMFs are insignificant on the servitude border.</td>
<td>Project Manager</td>
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<tr>
<td>SAFETY</td>
<td>There is the potential risk of electrocution (people and livestock) if access to the site is not controlled. 1. Safety and security issues should be addressed as a priority by Eskom. It is recommended that the landowners and affected community members be contacted in advance to ensure that they are forewarned of the construction and maintenance activities planned in the area. In addition, the local community must be educated about the dangers of high voltage electricity.</td>
<td>Project Manager</td>
<td>Monthly</td>
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</table>
## 7 DECOMMISSIONING PHASE

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<tr>
<th>ASPECT / IMPACT</th>
<th>MITIGATION</th>
<th>RESPONSIBILITY</th>
<th>FREQUENCY / MONITORING REQUIREMENTS</th>
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</table>
| DECOMMISSIONING | **Removal of equipment**  
1. All structures comprising the construction camp are to be removed from site.  
2. The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc, and these shall be cleaned up.  
3. All hardened surfaces within the construction camp area should be ripped, all imported materials removed, and the area shall be topsoiled and regressed. | Main Contractor, Project Manager, ECO | Weekly |
|                 | **Temporary services**  
1. The Contractor must arrange the cancellation of all temporary services.  
2. A copy of all waste disposal certificates from waste disposal service providers are to be presented to the Project Manager.  
3. Temporary roads must be closed and access across these blocked.  
4. All areas where temporary services were installed are to be rehabilitated to the satisfaction of the Project Manager. | | |
|                 | **Associated infrastructure**  
1. Surfaces are to be checked for waste products from activities such as concreting and cleared in a manner approved by the ECO.  
2. All surfaces hardened due to construction activities are to be ripped and imported material thereon removed.  
3. All rubble is to be removed from the site to an approved disposal site as approved by the ECO. Burying of rubble on site is prohibited.  
4. The site is to be cleared of all litter.  
5. The Contractor is to check that all watercourses are free from building rubble, spoil materials and waste materials.  
6. Fences, barriers and demarcations associated with the construction phase are to be removed from the site.  
7. All residual stockpiles must be removed to spoil or spread on site as directed by the ECO.  
8. All leftover building materials must be returned to the depot or removed. | | |
Environmental Management Programme: Construction of a 132kV Distribution Line from the existing Kliphoek to the existing Panbuilt Station: Mpumalanga Province

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<td>from the site.</td>
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<td>9.</td>
<td>The Contractor must repair any damage that the construction works has caused to neighbouring properties, specifically, but not limited to, damage caused by poor storm water management.</td>
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**Waste disposal**

1. Disposal of waste must be in accordance with relevant legislative requirements.
2. Waste must be disposed off in the appropriate manner at a licensed disposal site.

**Erosion**

1. Rehabilitation of areas affected by construction activities should ideally commence at the start of the raining season (November).
2. Recommended rehabilitation is in the form of active re-vegetation of affected areas, including areas where surface disturbances resulted from construction.
3. All areas of incomplete construction should be completed and prepared for final rehabilitation and re-vegetation;
4. All areas where topsoil was removed or placing of mono poles should be landscaped in order to reflect surrounding conditions.
5. Erosion monitoring and control should be conducted. This should be in the form of inspections subsequent to rains. Topsoil should be replaced in all areas that were eroded. It is critical that adequate topsoil remains in construction areas, implying that topsoil might need to be supplemented in some areas until such time that a layer of vegetation has stabilised the soil.
APPENDIX A: SENSITIVITY MAP
APPENDIX B:
ENVIRONMENTAL LEGISLATION
<table>
<thead>
<tr>
<th>Name of Act or Regulation</th>
<th>Area of Application</th>
<th>Responsible Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Environmental Management, Act (No 107 of 1998)</td>
<td>Control/prevention of pollution; combating of noise; activities which may have a detrimental effect on the environment, preparation and contents of environmental impact reports.</td>
<td>Department of Environmental Affairs; Department of Water Affairs; Provincial Department of Environmental Affairs</td>
</tr>
<tr>
<td>Conservation of Agricultural Resources Act (No 43 of 1983)</td>
<td>Control and prevention of veld fires, soil conservation, control, control of weeds and invader plants.</td>
<td>Department of Agriculture</td>
</tr>
<tr>
<td>Hazardous Substances Act (No 15 of 1973)</td>
<td>Provides for the control of substances, which may cause injury or ill health to, or the death of human beings.</td>
<td>National Department of Health. Local Authorities may be authorised</td>
</tr>
<tr>
<td>Occupational Health and Safety Act (No 85 of 1993)</td>
<td>Controls the exposure of employees and the public to dangerous and toxic substances or activities.</td>
<td>Department of Labour</td>
</tr>
<tr>
<td>National Veld and Forest Fire Act (No 101 of 1998)</td>
<td>Control and prevention of veld fires.</td>
<td>Department of Forestry</td>
</tr>
<tr>
<td>Road Traffic Act (No 29 of 1989)</td>
<td>Provides for road traffic matters.</td>
<td>Department of Transport</td>
</tr>
<tr>
<td>White Paper on the Conservation and Sustainable Use of South Africa’s Biological Diversity</td>
<td>Sets out the government’s policy towards and strategy for achieving the objectives of the United Nation’s Convention on Biological diversity (or biodiversity)</td>
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<tr>
<td>All relevant Provincial regulations, Municipal by-laws and ordinances</td>
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</table>
APPENDIX C:
ESKOM STANDARD FOR BUSHCLEARING
<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Follow up</th>
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</thead>
<tbody>
<tr>
<td>Centre line of the proposed Sub-transmission line</td>
<td>Clear to a maximum (depending on tower type and voltage) of an 8 m wide strip of all vegetation along the centre line. Vegetation to be cut within 100 mm of the ground. Treat stumps with herbicide.</td>
<td>Re-growth shall be cut within 100 mm of the ground and treated with herbicide, as necessary.</td>
</tr>
<tr>
<td>Inaccessible valleys (trace line)</td>
<td>Clear a 1 m strip for access by foot only, for the pulling of a pilot wire by hand.</td>
<td>Vegetation not to be disturbed after initial clearing – vegetation to be allowed to re-grow.</td>
</tr>
<tr>
<td>Access / service roads</td>
<td>Clear a maximum (depending on tower type) 5 m wide strip for vehicle access within the maximum 8 m width, including de-stumping / cutting stumps to ground level, treating with a herbicide and re-compaction of soil.</td>
<td>Re-growth to be cut at ground level and treated with herbicide as necessary.</td>
</tr>
<tr>
<td>Proposed tower position and proposed support / stay wire position</td>
<td>Clear all vegetation within proposed tower position and within a maximum (depending on tower type) radius of 5 m around the position, including de-stumping / cutting stumps to ground level, treating with a herbicide and re-compaction of soil. Allow controlled agricultural practices, where feasible.</td>
<td>Re-growth to be cut at ground level and treated with herbicide as necessary.</td>
</tr>
<tr>
<td>Indigenous vegetation within servitude area (outside of maximum 8 m strip)</td>
<td>Area outside of the maximum 8 m strip and within the servitude area, selective trimming or cutting down of those identified plants posing a threat to the integrity of the proposed Sub-transmission line.</td>
<td>Selective trimming</td>
</tr>
<tr>
<td>Alien species within servitude area (outside of maximum 8 m strip)</td>
<td>Area outside of the maximum 8 m strip and within the servitude area, remove all vegetation within servitude area and treat with appropriate herbicide.</td>
<td>Cut and treat with appropriate herbicide.</td>
</tr>
</tbody>
</table>