PROPOSED CONSTRUCTION OF THE NEW CLOCOLAN-FICKSBURG 88 KV POWER LINE AND 2 X 20 MVA MARALLANENG 88/11 KV SUBSTATION, SETSOTO LOCAL MUNICIPALITY, FREE STATE

AMENDED ENVIRONMENTAL MANAGEMENT PROGRAMME

EIA REF NO 14/12/16/3/3/1/797
ESKOM DISTRIBUTION

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<table>
<thead>
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<th>Name</th>
<th>Education Qualifications</th>
<th>Professional Affiliations</th>
<th>Experience at Environmental Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Rolf-Dieter Heinsohn</td>
<td>PhD</td>
<td>South African Association of Botanists</td>
<td>25 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>International Association of Impact Assessment (South African Chapter)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>South African Institute of Ecologists and Environmental Scientists</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Certified Environmental Practitioner with the Interim Certification Board of South Africa</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Certified with the South African Council for Natural Scientific Professions (400442/04)</td>
<td></td>
</tr>
<tr>
<td>Mr Keagan Kruger</td>
<td>BSc (Botany and Zoology)</td>
<td>International Association of Impact Assessment (South African Chapter)</td>
<td>3.5 years</td>
</tr>
</tbody>
</table>

Table 1  Names and expertise of persons who compiled the EMPr
## GLOSSARY, ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>ABE</td>
<td>Affirmative Business Enterprise</td>
</tr>
<tr>
<td>AC/DC</td>
<td>Alternating Current / Direct Current</td>
</tr>
<tr>
<td>ACER</td>
<td>ACER (Africa) Environmental Consultants</td>
</tr>
<tr>
<td>BAR</td>
<td>Basic Assessment Report</td>
</tr>
<tr>
<td>DAFF</td>
<td>Department of Agriculture, Fisheries and Forestry</td>
</tr>
<tr>
<td>DEA</td>
<td>Department of Environmental Affairs</td>
</tr>
<tr>
<td>DWS</td>
<td>The Department of Water and Sanitation</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Authorisation</td>
</tr>
<tr>
<td>ECO</td>
<td>Environmental Control Officer</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment as contemplated in GN R982 of 8 December 2014 (“GN R 982”) of the National Environmental Management Act (107 of 1998)</td>
</tr>
<tr>
<td>EMPr</td>
<td>Environmental Management Programme</td>
</tr>
<tr>
<td>Environment</td>
<td>The “environment” is defined in terms of the National Environmental Management Act (Act 107 of 1998) as 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 wellbeing</td>
</tr>
<tr>
<td>Environmental Impact</td>
<td>The change to the environment resulting from an environmental aspect (an activity) on the environment, whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity</td>
</tr>
<tr>
<td>Fauna</td>
<td>All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency</td>
</tr>
<tr>
<td>Fence</td>
<td>A physical barrier in the form of posts and barbed wire or any other concrete construction, (“palisade”- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries</td>
</tr>
<tr>
<td>Flora</td>
<td>All living plants, grasses, shrubs, trees, etc. usually incapable of easy natural motion and capable of photosynthesis</td>
</tr>
<tr>
<td>GN</td>
<td>Government Notice</td>
</tr>
<tr>
<td>IDP</td>
<td>Integrated Development Plan</td>
</tr>
<tr>
<td>Induction Training</td>
<td>Training provided to all new employees prior to them being allowed on site</td>
</tr>
<tr>
<td>kV</td>
<td>Kilovolt</td>
</tr>
<tr>
<td>LV</td>
<td>Low Voltage</td>
</tr>
<tr>
<td>MVA</td>
<td>Mega Voltage Ampere</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Environmental Management Act (Act 107 of 1998)</td>
</tr>
<tr>
<td>NHRA</td>
<td>National Heritage Resources Act</td>
</tr>
<tr>
<td>Non-compliance</td>
<td>Failure to comply with the requirements of the EMPr</td>
</tr>
</tbody>
</table>
| Pollution | Any change in the environment caused by substances, radioactive or other waves, or noise, odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an
effect in the future.

**Potentially hazardous substance**

This is a substance which can have a harmful effect on the environment. Hazardous Chemical Substances are defined in the Regulations for Hazardous Chemical Substances published in terms of the Occupational Health and Safety Act.

**Progressive Reinstatement**

Reinstatement of disturbed areas to topsoil profile on an ongoing basis immediately after selected construction activities (e.g. backfilling of a trench) are completed. This allows for passive rehabilitation (i.e. natural recolonisation by vegetation) to commence.

**RE Rehabilitation**

Rehabilitation is defined as the return of a disturbed area to a state, which approximates the state (where possible), which it was before disruption. Rehabilitation for the purposes of this specification is aimed at post-reinstatement re-vegetation of a disturbed area and the insurance of a stable land surface. Re-vegetation should aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.

**SABS**

South African Bureau of Standards.

**SANS**

South African National Standards.

**SAHRA**


**SME**

Small and Medium Enterprise.

**SOC**

State Owned Company.

**Solid waste**

All solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

**Stormwater**

Rainfall run-off from the site.

**Subsoil**

Subsoil is the soil horizons between the topsoil horizon and the underlying parent rock. Subsoil often has more clay-like material than the topsoil. Subsoil is of less value to plants, in terms of nutrient (food) and oxygen supply, than topsoil. When subsoil is exposed it tends to erode fairly easily.

**TOPS**

Threatened or Protected Species.

**Topsoil**

The layer of soil covering the earth which provides a suitable environment for the germination of seed; allows the penetration of water; is a source of micro-organisms, plant nutrients and in some cases seed; and is not of a depth of more than 0.5 metres or such depth as the Minister may prescribe for a specific prospecting or exploration area or mining area.

**Wastewater**

Water containing cement washings, oil, fuel or other contaminants.

**Weeds and invader plants**

Weeds and invader plants are defined as undesirable plant growth that shall include, but not be limited to all declared category 1, 2 and 3 listed invader species as set out in the Conservation of Agricultural Resources Act, Act 43 of 1983 regulations. Other vegetation deemed to be invasive are those plant species that show the potential to occupy in number, any area within the defined construction area.

**Wetland**

A low lying area where the land is saturated with water, either permanently or temporarily and as characterised by specific indicator plant species and soil types
1. INTRODUCTION

1.1 Scope

This Environmental Management Programme (EMPr) provides environmental specifications for the design, construction, operation and maintenance phases for the removal and relocation of the existing, and construction of the proposed 88 kV distribution line between Ficksburg and Clocolan, the upgrades to existing transformers at the Ficksburg Municipal Substation (Figure 1), and the proposed construction of the Marallaneng Substation (Figure 2). These specifications include site and project specific recommendations that have been identified during the original environmental assessment and subsequent environmental authorisation amendment process undertaken for the proposed infrastructure. Further details are provided below.

1.2 Project Background

At present, the Ficksburg Municipality Substation is supplied from Clocolan DS via 1 x 88 kV Mink power line and has 4 x 5 MVA 88/11 kV transformers installed. The maximum demand for the transformers was measured at 16.82 MVA in 2011, which is 84% loading of the installed capacity. The substation is a radial substation, which supplies approximately 9,000 customers. One of the draw backs of the current configuration of the electrical infrastructure is that a fault on the existing 88 kV power line results in supply being lost to all customers. The aim of this project is to supply a radial feed which will ensure a secure power supply to customers should one of the power lines experience a fault.

Eskom received environmental authorisation from the DEA on 14th February 2014, as per the prevailing environmental legislation in force at that time (i.e. the Environmental Impact Assessment (EIA) Regulations of 2010 promulgated under the National Environment Management Act (NEMA) (Act No. 107 of 1998), for the proposed construction of the new (second) 88 kV power line and associated infrastructure between the existing Clocolan Substation in the town of Clocolan and the Ficksburg Substation in the town of Ficksburg within the Setsoto Local Municipality, Free State.

Eskom now wishes to apply for a substantive amendment to the EA issued to ensure that the new 88 kV power line route, the removal and relocation of the existing 88 kV power line, and the proposed construction of the Marallaneng Substation are aligned with the EA and the conditions contained therein.

1.2.1 Technical details of the project

1.2.1.1 Proposed 88 kV power line

The proposed power line will consist of double circuit structures, which will carry both the new and existing 88 kV power lines for the entire route between Clocolan and Ficksburg, except where the power lines enter the substations, which they will need to do on single circuit structures:

- Double circuit Lattice Towers of the 245 Series are to be erected for all bends and inline strain towers along the double circuit sections.
- Planted steel mono-pole structures are to be erected for all intermediate structures.
- The height of the structures will range between 18.0 m and 28.0 m.
- The span lengths between the structures will vary between 225 m and 250 m depending on terrain. These variations are due to a number of factors including the structure, the terrain, ground clearance requirements and geology.
The operation and construction servitides will be 31 m (i.e. 15.5 m on either side of the centre line).

1.2.1.2 Removal and Relocation of the Existing 88 kV Power Line
The existing 88 kV power line between Clocolan and Ficksburg will be removed and relocated onto the double circuit structures, which will carry both the new and existing 88 kV power lines for the entire route, except where the power lines enter the substations, which they will need to do on single circuit structures:

1.2.1.3 Proposed 2 X 20 MVA Marallaneng 88/11 kV Substation
- The construction of the 80 m x 80 m new 2 x 20 MVA (Mega Volt Ampere) Marallaneng 88/11 kV Substation at the proposed centre coordinates: 28°53'49.28" S / 27°51'2.28" E.
- Installation of two 88 kV line bays. (88kV feeder bay consist of Line isolator, 132 kV current transformer, 132 kV voltage transformers, transformer isolators/busbar isolators, LV isolators, transformer, transformer breaker, busbar)
- Installation of six outgoing 11 kV feeders and make provision for a spare feeder bay. (11 kV Feeder bay consist of LV surge arrestors, Voltage transformers, current transformers, breaker isolators, breaker, feeder isolators)
- Install all the necessary protection schemes, metering, Scada, AC/DC systems and telecommunications in the control room of the Marallaneng Substation.

1.2.2 Location
The study area is located in the eastern region of the Free State Province. The project falls within the Setsoto Local Municipality, one of the four local municipalities within the Thabo Mofutsanyana District Municipality. The study area is characterised by agricultural activities and residential settlements with agriculture consisting predominantly of livestock farming, crop farming, fresh produce farming and the residential settlements of Clocolan and Ficksburg (Setsoto IDP, 2012 – 2013).

1.2.3 Access
As the proposed alignment is currently serviced by existing road networks, no additional roads will be required during the construction and operation of the proposed new 88 kV power line and Marallaneng Substation. It is anticipated, however, that during construction the contractor will need to create short access tracks to access the construction sites for the towers. These tracks are anticipated to be created by driving over the veld (with no blading of vegetation or the soil), will be temporary in nature and will be rehabilitated once construction is completed.

The study area can be accessed by four main provincial roads as well as a number of local district roads (gravel roads) which can also be used for access to the proposed power line alternatives. The provincial road R26 between Clocolan and Ficksburg is the main link between the major urban centres within the study area and runs directly parallel to the preferred route alignment of the proposed new 88 kV power line.
Figure 1: Existing (Yellow), Authorised (Blue) and Amended (Green) 88 kV Clocolan-Ficksburg Power Lines
Figure 2 Proposed 2 x 20 MVA Marallaneng 88/11 kV Substation Final Placement (outside delineated wetlands and buffer zones), showing Existing (Yellow) Authorised (Blue), Amended (Green) 88 kV Power Lines and the 11 kV Feeder Lines (Red).
1.3 Environmental Authorisation

In terms of the 2014 Environmental Impact Assessment Regulations (GNR. 982, of December 2014) published under Section 24 and read with Section 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (as amended) (NEMA), the proposed project includes activities that may significantly affect the environment. The project may not commence without an EA from the relevant authority, in this case, the national DEA. This Amended EMPr is provided with the Amendment Report for submission to DEA, as part of the process required to obtain an amendment (Part 2) of the existing EA. When/if the EA amendment application is granted, it will be appended to this amended EMPr.

1.4 Applicable Documentation

The following environmental documentation applies to this project and should be read in conjunction with this amended EMPr:

- Basic Assessment Report for the proposed Ficksburg – Clocolan 88 kV power line.
- EA Amendment Report.
- Environmental Authorisation issued by the Department of Environmental Affairs.
- Amended Environmental Authorisation issued by the Department of Environmental Affairs.
- Eskom’s Standards for Construction of Electrical Infrastructure.

Cognisance of the Amended EA must be taken once it has been issued and, where necessary, this EMPr must be amended to comply with it.

In addition to the above, the following Eskom Standards amongst others are to be complied with during construction and operation of the proposed development:

- Eskom Technical Standards (TRMSCAAC1 Revision 3).
- Eskom’s Standard for Vegetation Management Services on Eskom Networks.
- Eskom’s Herbicide Management Policy (ESKPBAAD4)
- Eskom’s Standard for the safe use of Pesticides and Herbicides (ESKASAAL0)
- Eskom’s Fire Protection Association Guideline (TGL31-336)
- Eskom’s Standard for Fire Risk Management (EST 32-124)
- Eskom’s Access to Farms Standard (TPC 41-340)
- Eskom’s Erosion Guideline (TGL 41-337)
- Eskom’s Standard for Transmission Line Towers and Line Construction (TRMSCAAC1)
- Eskom Transmission Bird Nesting Guidelines (TGL41-333)
- Eskom Transmission Bird Perch Guidelines (TGL41-332)
- Eskom Transmission Bird Collision Prevention Guideline (TGL41-335)
- Eskom’s Specifications for Bird Flight Diverters
- Eskom Transmission Environmental Policy(TPL41-435)

Copies of these standards can be found appended to this EMPr.
1.5 **Objectives of the EMPr**

The EMPr 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.
- To prevent long-term or permanent environmental degradation.

2. **ADMINISTRATIVE STRUCTURE**

2.1 **Roles and Responsibilities**

To ensure that key procedures regarding environmental management and implementation of this EMPr are executed, formal responsibilities must be assigned to designated staff.

2.1.1 **The Project Manager (PM)**

The PM will be responsible for the overall management and overseeing of the contract, from initiation to completion of construction. As such, the PM is the ultimate custodian of all elements of the project, from design, construction and commissioning through to operations and ultimately de-commissioning. In these terms, the PM is, *inter alia*, the ultimate custodian of all environmental management requirements and legal obligations for the project. In response to these requirements the PM:

- Will be expected to be familiar with and ensure adherence to the conditions of the EMPr and Environmental Authorisation, including any potential amendments or additions to these documents.
- Will be responsible for monitoring site activities, both directly and through appointed agents, in order to ensure compliance.
- Must ensure that sufficient resources are available to the other role players to efficiently perform their tasks in terms of the EMPr.
- Must appoint the independent Environmental Control Officer (ECO) on behalf of Eskom to ensure strict adherence to the EMPr.

2.1.2 **The Environmental Manager**

The role of the Environmental Manager is to ensure that all environmental management requirements are recognised and effectively implemented during the execution of the project. Specific requirements include to:

- Plan and direct the implementation of the EMPr.
- Ensure that all construction procedures and method statements comply with the environmental requirements in this EMPr.
- Manage scheduled site inspections on contractors’ performance on site, with subsequent report back to management.
- Coordinate and oversee the activities of the ECO.
- Ensure that information is effectively communicated and distributed between all parties.
- Be aware of the environmental issues relating to the project and regularly meet with the ECO to keep abreast of current events. Should an ECO not be able to respond to a
specific query from the Contractor or Contractors’ environmental personnel or a landowner, the matter must be referred to the Environmental Manager who will take whatever actions are deemed necessary.

2.1.3 The Environmental Control Officer

The Environmental Control Officer (ECO) will be appointed by Eskom, prior to the start of the site preparation and construction phase. The ECO will monitor compliance with the EMPr. The role of the ECO is to support the successful implementation of the EMPr through:

- Investigating and reporting on environmental incidents.
- Auditing the implementation of the EMPr.
- Overseeing the execution of the activities described in the EMPr.
- Monitoring the implementation of the monitoring programme (if relevant).
- Providing liaison on environmental issues between all other parties, i.e. the Contractor, Project Manager, Construction Manager/Resident Engineer, Landowners and Authorities.
- Full familiarisation with the findings and conditions of the EMPr and Environmental Authorisation, including any potential amendments or additions to these documents.
- Having a good working knowledge of all relevant environmental policies, legislation, guidelines and standards.
- Ensuring that all Contractors/Contractor environmental personnel/sub-contractors/employees are fully aware of their environmental responsibilities.
- Monitoring the actions of the above parties to ensure that the Contractors are adhering to all stipulations of the EMPr.
- Conducting site inspections at regular intervals as stated within the EMPr and/or Environmental Authorisation as well as on a case-by-case basis as the conditions of the project may determine. The findings should be documented.
- Submitting EMPr compliance reports at regular intervals as determined by the EMPr and/or Environmental Authorisation and submitting these to the Contractor for appropriate and timeous action, if required. Copies of the reports will also be submitted to the Project Manager and relevant authorities, and any other parties determined by the Environmental Authorisation.
- Regular liaison with all Interested and Affected Parties (I&AP) including all landowners.
- Conducting a post construction environmental audit to ensure that all conditions in the EMPr have been adhered to.

2.1.4 The Construction Manager/Resident Engineer

The role of the Construction Manager/Resident Engineer is to ensure that all contractors on site abide by the requirements of the EMPr and that the infrastructure is constructed in such a manner that meets all specified contractual and legal environmental requirements. The Construction Manager/Resident Engineer shall be fully conversant with the Basic Assessment Report and Amendment Report for the project, the conditions of the Environmental Authorisation (EA) (as amended), the EMPr (as amended) and relevant environmental legislation. The Construction Manager/Resident Engineer shall be in regular communication with the ECO and Environmental Manager.
2.1.5 The Contractor

The Contractor(s) shall:

- Ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts.
- Discuss implementation of and compliance with this document with staff at routine site meetings.
- Report progress towards implementation of and non-conformances with this document at site meetings.
- Advise the ECO of any incidents or emergencies on site, together with a record of action taken.
- Report and record all accidents and incidents resulting from injury or death.

2.2 Compliance monitoring, reporting and record keeping

2.2.1 Design phase compliance monitoring

During the design phase, the Project Manager and Environmental Manager will ensure that design recommendations from the environmental assessment and conditions of the EA (as amended) are properly considered and incorporated in the project design. In addition, the Project Manager and Environmental Manager will ensure that timeous planning is undertaken in order to meet environmental standards, licensing and permitting requirements.

2.2.2 Construction phase compliance monitoring

An Independent ECO will be appointed to monitor compliance with the EMPr (as amended) during construction. The ECO will conduct regular site inspections as required but as a minimum, during the following periods:

- Site handover.
- Monthly site inspections (usually to coincide with monthly site meetings).
- Substantial completion.
- Final completion.
- Defects liability period.

Monthly environmental compliance reports shall be forwarded to the Environmental Manager, copied to the Construction Manager and Contractor(s) with all information relating to environmental matters. The following will be included in the compliance reports:

- Complaints received from affected parties and actions taken.
- Environmental incidents, such as oil spills, concrete spills, etc. and actions taken.
- Incidents possibly leading to litigation and legal contraventions.
- Environmental damages that need rehabilitation measures to be taken.

The following documentation shall be kept on site:

- Access negotiations and physical access plan.
- Site daily dairy.
- Complaints Register.
- Records of all remediation/rehabilitation activities.
- Copies of fortnightly reports to the Distribution Services Environmental Advisor for auditing purposes.
2.2.3 *Method statements*

Before a construction activity commences, the Construction Manager and ECO will agree which activities require a written method statement. In such cases, the Contractor, with assistance from the ECO, will submit a written method statement, which should include the following:

- The type of construction activity.
- Locality where the activity will take place.
- Identification of impacts that might result from the activity.
- Identification of activities or aspects that may cause an impact.
- Methodology and/or specifications for impact prevention for each activity or aspect.
- Methodology and/or specifications for impact containment for each activity or aspect.
- Emergency/disaster incident and reaction procedures.
- Treatment and continued maintenance of impacted environment.

2.2.4 *Complaints register*

The Construction Manager shall:

- Report incidents involving employees and/or the public that could potentially cause negative sentiment and perception towards the project and/or Eskom.
- Report environmental complaints and correspondence received from the public to the Project Manager or the ECO.
- Record and report incidents that cause harm or may cause harm to the environment to the ECO.

The ECO shall ensure that the following information is recorded for all complaints/incidents:

- Nature of complaint/incident.
- Causes of complaint/incident.
- Party/parties responsible for causing complaint/incident.
- Immediate actions undertaken to stop, reduce, or contain the causes of the complaint or incident.
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident.
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions.
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented.
- Copies of all correspondence received regarding complaints or incidents.
2.2.5 Non-compliance

The Contractor(s) and their Sub-contractors are deemed not to have complied with the EMPr if:

- There is evidence of contravention of the EMPr specifications within the boundaries of the construction site, site extensions and access roads.
- There is contravention of the EMPr specifications that relate to activities outside the boundaries of the construction site.
- Construction activities take place outside approved areas.
- Environmental damage ensues due to negligence or intent.
- Failure to comply with corrective or other instructions issued by authorised designated personnel within a specific time period.

Where the ECO identifies non-compliance by the Contractors and Sub-contractors, it will be discussed at the monthly site meetings (or when identified) and remedial actions and associated timeframes specified. The ECO will record these incidents of non-compliance together with the specified remedial actions and timeframes in the site inspection checklist (which serves as the monthly environmental audit report). The Construction Manager must also record the relevant instructions for the Contractor(s) in the site diary.

Failure by the Contractor to comply with an instruction to procure the carrying out of the required remedial work shall constitute a material breach of the Contract, entitling Eskom to the applicable remedy.

2.2.6 Environmental awareness training (induction)

The Contractor is to ensure that all site staff under-go an environmental awareness training programme (to be co-ordinated by the Environmental Manager) that will address:

- The conditions of the Environmental Authorisation (as amended) and content of the EMPr (as amended).
- The importance of compliance with all environmental policies, procedures, plans and systems.
- Understanding, and importance of, and the reasons why, the environment must be protected.
- Basic awareness and understanding of the key environmental features of the work site and environs, particularly sensitive habitats.
- The significant environmental impacts, actual or potential, as a result of their work activities.
- The mitigation measures required to be implemented when carrying out their work activities.
- The environmental benefits of positive environmental performance.
- The various roles and responsibilities in achieving compliance with the environmental policy and procedures, including emergency preparedness and response requirements.
- The potential consequences of departure from specified operating procedures.
2.2.7 Emergency preparedness and reporting

Relevant emergency numbers are to be clearly displayed on site and communicated to all personnel.

The Contractor shall compile and maintain environmental emergency procedures to ensure that there will be an appropriate response to unexpected or accidental actions or incidents that will cause environmental impacts, throughout the life cycle of the project. The Construction Manager should be familiar with these procedures and be responsible for the co-ordination thereof should there be multiple Contractors on site simultaneously.

Emergencies are defined as serious cases of the following incidents, which cannot be dealt with according to the standard specifications contained in this EMP:

- Accidental discharges of hazardous substances to water and land.
- Accidental exposure of employees to hazardous substances.
- Accidental veld or forest fires.
- Accidental spillage of hazardous substances.

These plans should include:

- Emergency organisation (manpower) and responsibilities, accountability and liability.
- A list of key personnel.
- Details of emergency services applicable to the various areas along the route (e.g. the fire department, spill clean-up services, etc.).
- Internal and external communication plans, including prescribed reporting procedures where required by legislation.
- Actions to be taken in the event of different types of emergencies.
- Incident recording, progress reporting and remediation measures required to be implemented.
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.
- Training plans, testing exercises and schedules for effectiveness.

In compiling the emergency plans, the Contractor shall comply with the emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act, Act 85 of 1993, the National Environmental Management Act, Act 107 of 1998, the National Water Act, Act 36 of 1998 and the National Veld and Forest Fire Act, Act 101 of 1998 as amended and/or any other relevant legislation.

2.3 Compliance with Environmental Management Programme Specifications during operation and maintenance

All persons employed by Eskom or its Contractors shall abide by the specifications relating to operation and maintenance in this EMP.

- Any members of the operation and maintenance workforce found to be in breach of any of the specifications contained within the EMP may be ordered by the Project Manager to leave the site. The order may be given orally or in writing.
- Confirmation of an oral order will be provided as soon as practically possible, but the absence of a written order shall not be cause for an offender to remain on site.
- Eskom or a Contractor shall not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMP.
2.4 Review and Updating of the EMPr

The EMPr is a living document and should be reviewed and updated in response to new or changing technical information, environmental conditions, legislation and policy, and environmental best practice. Substantial changes must be approved by the DEA.

*Sections 3 to 8 contain the environmental specifications required for each of the stages, viz. design, pre-construction, construction, rehabilitation, operation and decommissioning. These sections are deliberately repetitive, as in many cases, an environmental aspect requires attention at more than one stage of the project cycle.*

3. PLANNING AND DESIGN PHASE

3.1 Environmental obligations, licensing, permitting and relevant standards

Timeous consideration and forward planning must be undertaken in respect of environmental legal obligations, permits, standards etc. that need to be met prior to or during construction.

### 3.1.1 Control of alien vegetation

In terms of Government Notice R1048 (under the Conservation of Agricultural Resources Act, 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.
  - The application of a suitable chemical weed-killer (herbicide).
  - Any other method of permanent eradication.
- One may not uproot or remove such plants and dump or discard them elsewhere to regrow 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.

**Alien invasive plants are to be removed and controlled in the cleared servitude areas and other areas disturbed by construction.**

### 3.1.2 Protected trees (national protection)

Trees are protected for a variety of reasons, and some species require strict protection while others require control over harvesting and utilisation. In terms of the National Forests Act, 1998 (Act No 84 of 1998) trees in natural forests or protected tree species (as listed in Government Gazette Notice 1012 of 27 August 2004) may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold - except under licence granted by the Department of Agriculture, Fisheries and Forestry (DAFF). Each application is evaluated on merit (including site visits) before a decision is taken whether or not to issue a licence (with or without conditions). Such decisions must be in line with national policy and guidelines.
Application for licenses must be applied for well in advance of construction. Failure to timeously obtain licenses could result in a delay to the project.

Due to the absence of indigenous forest and protected tree species along the proposed route alignment it is unlikely that licenses pertaining to protected trees are required.

### 3.1.3 Protected species (provincial protection)

Protected indigenous plants in the Free State are controlled under the relevant Provincial Ordinances or Acts dealing with nature conservation. The Free State Nature Conservation Ordinance, 1969 (Ordinance No. 8 of 1969) still applies in the Free State. Included within the provincial Ordinance is the legislation regarding plant and animal species on the Red Data list.

The National Environmental Management: Biodiversity Act (No. 10 of 2004) also applies. Lists of Threatened or Protected Species (TOPS) are provided in a Schedule to the Biodiversity Act Regulations\(^1\) by the Department of Environmental Affairs. The relevant issuing authority (the Minister, MEC or official of the relevant department\(^2\)) will decide upon all permit applications.

A ‘walk down’ by a suitably qualified ecology must precede construction to identify protected plants and, if necessary, apply for any necessary permits for removal and relocation of these plant species, prior to the commencement of construction.

### 3.1.4 Wetlands

Wetlands are protected under the Conservation of Agricultural Resources Act, Act 43 of 1983, and under the National Water Act, Act 36 of 1998. Under the Conservation of Agricultural Resources Act, land users are forbidden to drain or cultivate any vlei areas without written permission. Under the National Water Act, no land use shall utilise the vegetation in a vlei or flood area of a watercourse in a manner that may cause the damage or deterioration thereof.

The construction of the new power line falls under Appendix D2 of GN509 of 2016, which lists activities undertaken by State Owned Companies (SOC’s) that may be generally authorised subject only to the conditions of the notice.

The construction of the Marallaneng Substation will require a licence from the Department of Water and Sanitation (DWS) as this activity would fall under one of the specified water uses under Section 21 of the National Water Act: (c) and/or (i) for impeding or diverting the flow and/or altering the bed, banks, course or characteristics of a 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.

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\(^1\) GG No. 29657 GN No. 152 of 23 February and GG No. 30703 GN No. 69 of 28 January 2008
\(^2\) Regulation 3 of GG No. 30703 GN No. 69 of 28 January 2008
3.1.5 Abstraction of water

If water is to be abstracted from a public stream during construction (for construction activities), a license is required from DWS should the legislated thresholds be exceeded. If water is to be abstracted from water resources on private landowners properties, it will be necessary to establish whether their water use rights are still valid in terms of the provisions of the National Water Act, negotiate with the relevant landowners and then obtain a permit from DWS in terms of Section 21, 40 and 41 of the National Water Act (No 36 of 1998).

The Contractor shall be responsible for obtaining permission from the relevant landowner and DWS, prior to abstracting water from any river or water resource where the volumes abstracted require registration or licensing in terms of the National Water Act and any general authorisation in terms of Section 39(1) of the National Water Act.

It is recommended that use of water be restricted to potable water supplied to the site, or use of farm dams (with existing permission for use) in which case no permits will be required.

3.1.6 Heritage sites

In terms of the National Heritage Resources Act (No 25 of 1999), a permit must be obtained from the South African Heritage Resources Agency (SAHRA) for the disturbance, removal or destruction of any national and provincial heritage sites, archaeological and palaeontological 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).

No structures or heritage sites requiring permits have been identified within the study area, however the potential impact of excavations for the footprint Marallaneng Substation, on the subterranean fossil bearing strata, is highly likely. A palaeontologist with experience of the Permian Extinction Zone must be appointed to have a watching brief to monitor excavations during establishment of the Substation platform. The palaeontologist must be permitted by the relevant heritage authority to collect, rescue and record fossils during these excavations.

Should any heritage resources, as defined in the National Heritage Resources Act 1999, be discovered either during the course of development activities, the Contractor is required to cease all work immediately and notify SAHRA. SAHRA will inform the way forward.

3.1.7 Waste disposal

All waste (general and hazardous) generated during the construction of the power line and associated infrastructure may only be disposed of at appropriately licensed sites (in terms of Section 20 of the Environment Conservation Act, No 73 of 1989). Cognisance must also be taken of the relevant provincial legislation in this regard.

Waste management activities must be compliant with the requirements of the National Environmental Management: Waste Act (59 of 2008). Listed activities provided in the Environmental Conservation Act have been ‘carried over’ to the Waste Act. Waste management activities that require a license are listed in GN No. 718 of 3 July 2009.
Unauthorised disposal of waste is prohibited in terms of the Act (Section 26). Proper waste management practices must be carried out throughout the duration of the project. The waste must be transported in a manner agreed to by the relevant municipalities (sections 23, 24, and 25).

Provided the waste produced by the proposed activities is disposed of at licensed waste management facilities, no permitting or licensing will be required.

3.1.8 Hazardous substances

Hazardous substances must be stored and handled in accordance with the applicable legislation and standards, which may include the Hazardous Substances Act, the Occupational Health and Safety Act, relevant regulations, and applicable South African Bureau of Standards (SABS) and international standards.

3.2 Sensitive environments

The following areas are considered sensitive and need to be avoided as far as possible. Where unavoidable, construction activities are to be undertaken in a manner which minimises interference with such areas. The ECO is to ensure that the Contractor is fully familiarised with these areas, as it is not possible to physically demarcate all of them.

- Wetlands (in particular, hillslope seeps) and associated flora and fauna (including birds).
- Rocky sandstone ridges and mountain slopes (important habitat for fauna).
- Areas actively colonised by moles/mole rats (as seen by burrows).
- Pristine areas within the Eastern Free State Clay Grassland, a vulnerable ecosystem.
- Areas and corridors of scenic beauty such as the Maluti Tourism Route, the Meul River Gorge and the Meulspruit Dam.
- Areas identified by the ECO as supporting protected plants and animals.

3.3 Impacts on agricultural activities, services and infrastructure

- Align the distribution lines as closely as possible to the edges of cultivated fields in order to allow for optimum utilisation of remaining land.
- The loss of agricultural land will require the negotiation of suitable compensation between Eskom and affected landowners.
- Landowners need to be informed that spraying of crops within the electrical servitudes will have to be undertaken using tractor driven sprayers or by hand.
- Liaise with the land owner/farm managers well in advance of the advent of construction, in order to provide sufficient time to plan their agricultural activities.
- If possible, schedule the timing of the construction phase so that it falls within the post-harvest, pre-planting season, when fields are lying fallow.
- The existing electrical network, telecommunication network, and any planned developments to this network, must be taken into consideration in the planning phase, before finalising any power line route.
- Liaise with affected stakeholders regarding the disruption of traffic flow prior to the stringing of constructors over roads and railway lines.
- Investigate the existence of fire and emergency management plans, which should be in place already, in conjunction with Local Municipalities and Farmers’ Associations.
4. **PRE-CONSTRUCTION PHASE**

The pre-construction phase refers to the period following final project planning and the tender phase, leading up to, but not including, the establishment on site by the appointed Contractor. These items may be the responsibility of the Contractor or the Project Engineer. Input and assistance may be obtained, where necessary, from the Environmental Manager and ECO.

4.1 **Construction Site Layout Plan**

A construction site layout plan must be compiled during the design phase by the Project Engineer, with assistance from the Environmental Manager. The plan should show the positions and extent of the known permanent and temporary site structures and infrastructure as listed below (as applicable):

- Site access (including entry and exit points).
- Roads and haul/access routes.
- Buildings and structures.
- Contractor camp(s).
- Material storage yards.
- Site office.
- Security requirements (including temporary and permanent fencing, and lighting) and accommodation areas for security staff.
- Gates and fences.
- Concrete batching areas.
- Essential services (permanent and temporary water, electricity and sewage).
- Sanitation (including the treatment/removal of sewage).
- Construction materials storage areas including the storage of fuels.
- Vehicle and equipment storage areas.
- Wash bays.
- Storm water control measures.
- Borrow areas (if required).
- Excavations and trenches.
- Stockpile/laydown areas.
- Spoil areas.
- Waste management including waste storage and disposal sites.
- Areas where vegetation will need to be cleared.
- Features and plants to be conserved.

4.2 **Construction Preparation**

- The Contractor must ensure that any required written permission from the landowner for use of land for the construction camp, pipe storage yards, stores and stockpile areas has been obtained.
- The ECO must take detailed, colour photographs of the site before any clearing may commence.
- The Contractor must ensure that he/she is familiar with the following prior to construction commencing:
  - Sensitive areas.
  - Mitigation measures.
  - Large, established, indigenous trees that should not be removed.
  - Wetlands and rivers/streams likely to be intersected by the project.
- Sanitation arrangements must be to the satisfaction of the Environmental Manager, the ECO, and the local authorities, and be compliant with all applicable legal requirements.
The Contractor must ensure that the Project Engineer and Environmental Manager are given timeous notice of the intention to commence construction.

4.3 **Specialist Walk-Downs**

Environmental specialist walk downs will occur during the design phase to identify particular aspects of concern prior to construction. The site specific recommendations following this walk down will need to be communicated to the ECO and Contractor and adhered to, as applicable.

4.4 **Acquisition of Permits and Licenses**

Applicable environmental permits and licences must be obtained prior to construction. Eskom’s environmental manager must ensure that these processes are commenced timeously. In terms of this project, the following permits apply:

- Development within the regulated area of a wetland (500 m) or watercourse (1:100 floodline) will require authorisation from the DWS.
- The removal or destruction of natural forests or individual trees protected in terms of the National Forests Act, 1998, will require a licence from the National Department of Agriculture, Forestry and Fisheries (DAFF).
- The removal or destruction of plants listed as threatened or protected species (TOPS) under the National Environmental Management Act: Biodiversity Act, 2004 (10 of 2004), will require a permit/licence from the provincial authority.

4.5 **Procurement Process**

- The Contractor’s procurement process is bound by the contract agreement with the Employer and must be in accordance with applicable procurement norms and standards.
- Local institutional structures, e.g. Setsoto Local Municipality, must be included in the procurement process.
- Where practical and applicable, training must be provided to local labourers in order to perform more specialised jobs.
- The Contractor must trade locally for goods and services, where possible and practical.
- The Contractor is encouraged to make use of emerging contractors from formerly disadvantaged communities, as sub-contractors or by the formation of joint ventures.
5. CONSTRUCTION PHASE

The construction phase refers to the period of the project during which construction activities are carried out. This section of the EMP outlines those general environmental specifications that are required to be implemented by the Contractor during construction. Where applicable, approval, assistance and/or guidance may be sought from the Project Engineer, RE, Environmental Manager and the ECO.

5.1 Establishment of the construction site and associated infrastructure

5.1.1 Contractor’s camp and construction area

Preferably, construction camps and storage areas should be located within the urban boundary of either Clocolan or Ficksburg so as to minimise environmental impacts on the natural environment and water bodies.

- Eskom shall be responsible for identifying a suitable site and obtaining any required written permission from the landowner for use of the site for erection of the Contractor’s camp, stores and stockpile areas.
- Contractor’s camps outside the authorised development footprint must not be within the regulated area of a wetland or water course without the relevant authorisations in place.
- When establishing the site, the Contractor shall minimise the footprint of disturbance so as to minimise the extent of soil erosion, loss of vegetation and the potential for pollution of soils and water resources.
- The servitude length for the 88 kV distribution line is approximately 35 km long and 31 m wide. Construction related activities will be limited to authorised access roads, the Contractor’s camp and the width of the servitude in which the power line will be constructed and to the 80 m x 80 m Marallaneng Substation.
- Any area outside the Eskom servitude areas, required to facilitate access, construction activities, construction camps or material storage areas, shall be negotiated with the affected landowners and written agreements shall be obtained.
- The Contractor’s workforces shall refrain from venturing outside of work areas and onto private property.
- Where possible, and as applicable (for example, construction camps) works shall be fenced for safety and security reasons.
- All areas used for waste storage and the loading of materials shall be lined. To contain any spills, bund walls shall be erected.
- Sanitation facilities, storages areas for fuel and depots for any substance which causes or is likely to cause pollution of a water resource may not be located within the 1:50 year flood-line of any watercourse.

5.1.2 Access roads

- Planning (inclusive of budgets and schedules) of access routes for construction purposes shall be done in conjunction with the Contractor, Eskom, the landowners and relevant authorities. All agreements reached should be documented in writing and no verbal agreements should be made. The condition of existing access/private roads to be used shall be documented with photographs. A physical access plan based on these agreements shall be compiled. This shall include any special measures that will be required to ensure access to private property.
- Existing roads only shall be used and no new access roads shall be constructed, other than where to access specific tower positions. In these cases, these access roads will be created simply by driving over the veld (i.e. no blading of vegetation or the soil).
When working near provincial or municipal roads, the construction footprint must be clearly signposted and motorists made aware of the presence of construction workers and associated dangers.

Property accesses shall be kept in a passable condition at all times.

Gravel roads identified for access must be investigated and upgraded, as applicable.

Public and private roads shall not be allowed to deteriorate beyond a reasonable service level.

No road works shall be performed on existing roads without the necessary permission from the relevant road authority or landowner, as well as signage being in place.

Where temporary access is required, the Contractor is (with permission of the landowner) to demarcate a temporary track in conjunction with the ECO, taking care to avoid sensitive areas and minimising damage to indigenous vegetation.

If vegetation removal is required, vegetation must be slashed by hand to allow access for the construction vehicles. This will mitigate the effects of compaction to the soil profile.

The installation of drainage structures, to facilitate access, shall be at the discretion of the ECO. All structures shall be properly designed and drawings shall be available for reference purposes. Any dangerous crossings shall be marked as such and, where necessary, speed limits shall be enforced.

These tracks shall be rehabilitated after the construction period by facilitating the natural regrowth of veld.

No driving across wetlands is permitted, even in the dry season.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimise damage to existing access roads</td>
<td>No complaints or claims from landowners due to damage on existing access roads</td>
</tr>
<tr>
<td>Minimise damage to environment due to construction of new access roads</td>
<td>No erosion visible on access roads six months after completion of construction</td>
</tr>
<tr>
<td>Minimise loss of topsoil and enhancement of erosion</td>
<td>No loss of topsoil due to runoff water on access roads</td>
</tr>
<tr>
<td>Minimise impeding the natural flow of water</td>
<td>No interference with the natural flow of water</td>
</tr>
</tbody>
</table>

5.1.3 Sanitation and ablution facilities

Sanitation facilities may be in the form of portable serviced toilets, or toilets with connections to the municipal infrastructure. Soak pits and French Drains shall not be used closer than 150 m from the edge of wetlands and pans.

Use of the “bush toilet” is not permitted under any circumstances.

Provision shall be made for enough toilets to accommodate the workforce (minimum requirement 1: 20 workers).

Separate facilities are to be provided for male and female workers.

Outside toilets should be provided with locks and doors and should be secured to prevent them from blowing over.

The toilets should also be placed outside areas susceptible to flooding.

Toilets shall be placed within 100 m from workplaces but not closer than 50 m from any natural water bodies.

Hand washing facilities must be provided for all personnel.
5.1.4 Workshop and equipment storage areas

- All maintenance of vehicles and equipment shall take place at existing workshops in the closest town and will not be conducted in the field.
- The soil in areas used for parking and storage of vehicles and equipment shall be protected from leaking machinery through the use of drip trays and/or other suitable protective and containing layers.
- These areas shall be monitored for oil and fuel spills and all spills shall be cleaned and remediated to the satisfaction of the ECO.
- A complete and functional emergency spill kit must be available at all times at the storage area within the construction camp.

5.1.5 Storage areas for hazardous substances

- All hazardous substances shall be stored in suitable containers in a properly secured, weatherproof and bunded storage area.
- Before containment or storage facilities can be erected, the Contractor shall provide details of the preventative measures that are proposed to be installed in order to mitigate against pollution of the surrounding environment from leaks or spillages. The proposals shall also indicate the emergency procedures to be implemented in the event of the misuse or spillage of substances that will negatively impact on an individual or the environment.
- Storage areas are to be sited in an area of low environmental sensitivity, i.e. in an area that is already cleared of natural vegetation and 100 m away from the edge of surface water bodies/wetlands.

5.1.6 Tower positions

- Towers shall not be placed closer than 30 m from the edge of a wetland (if unavoidable, there must be an authorisation from DWS in place).
- At any tower site where conventional foundations are installed, the Contractor shall remove the topsoil separately and store it for later use during rehabilitation of such tower sites. During backfilling operations, the Contractor shall take care not to dump the topsoil in the bottom of the foundation and then put subsoil on top.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection of wetlands</td>
<td>Towers are placed out of wetland soils</td>
</tr>
<tr>
<td>Minimise damage to topsoil and the environment</td>
<td>Topsoil correctly handled and reinstated</td>
</tr>
</tbody>
</table>

5.2 Protection of sensitive habitats

The removal of indigenous vegetation must be kept to a minimum by minimising the construction footprint and by confining areas for structures, services, stockpiling, new temporary access roads, etc to existing disturbed areas or areas within the construction site.

- As far as possible, indigenous plants or natural features should not be disturbed, destroyed or removed. The contractor must be held liable for the replacement of any indigenous plant or natural feature that is removed or damaged by the contractor's negligence or mismanagement.
- No material storage or laydown is permitted under trees.
- Vehicle and pedestrian traffic outside the construction area must be avoided.
5.2.1 Wetlands and watercourses

Work carried out in the regulated area of wetlands (500 m from delineated edge) and watercourses (1:100 year floodline) will be subject to the following measures:

- The relevant water use authorisation(s) must be obtained from DWS.
- The ECO and Eskom-appointed Contractor must ensure that all wetlands and rivers/streems likely to be affected have been identified, delineated, photographed and clearly marked prior to the start of construction activities.
- The timing of construction in wetlands and watercourses should be during the low flow season to minimise increased sedimentation and turbidity.
- No construction materials may be stockpiled in any wetland and riparian areas.
- The Contractor must avoid the unnecessary compaction and impacts on sensitive wetland and riparian soils.
- Replanting of wetland and riparian vegetation, with appropriate local species, must be undertaken immediately after surface reinstatement is complete.
- The use of fertilisers must be carefully controlled by the ECO. No fertiliser must be used in the re-vegetation process near watercourses or wetlands areas.
- Watercourses and wetland areas must not be used for swimming, bathing, or the cleaning of clothing, tools or equipment.
- The discharge of water containing polluting matter or visible suspended materials, fines and sediments directly into drainage lines or wetlands is prohibited.
- Near watercourses or wetland areas, topsoil must be stockpiled above the riverine zone.
- Waste or foreign material must not be dumped into any watercourses or wetland areas.
- Post construction, a monitoring and alien weed control programme must be implemented by Eskom for a minimum of a year to ensure no nick-point erosion develops in disturbed soils, wetland vegetation re-establishes and that alien weeds are controlled.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid damage to natural drainage channels and wet areas</td>
<td>No damage, erosion or unnatural vegetation die-off in wetlands and pans</td>
</tr>
</tbody>
</table>

5.2.2 Fauna

- Sensitive areas with respect to flora and fauna are to be identified and demarcated along the servitude by means of a walk through with the ECO and ecologist, prior to construction. Animal burrows that need to be avoided will be identified.
- Impacts on natural habitat shall be minimised by keeping clearance of indigenous vegetation to the minimum, using existing disturbed and transformed areas for site camps, access, parking, stockpiling and other damaging activities, and by adhering to the specifications provided in this EMPr.
- No poaching of fauna shall be tolerated under any circumstances.
- No collection of wood and plants, for any purpose, shall be allowed.
- Domestic pets such as dogs shall not be allowed on site.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimise disturbance of animals</td>
<td>No complaints from landowners and communities</td>
</tr>
</tbody>
</table>
5.2.3 *Avi-fauna*

- Impacts on natural habitat (and, thus, birds) shall be minimised by keeping clearance of indigenous vegetation to the minimum, using existing disturbed and transformed areas for site camps, access, parking, stockpiling and other damaging activities, and by adhering to the specifications provided in this EMPr.

5.2.4 *Flora*

- Sensitive areas with respect to flora and fauna are to be identified and demarcated along the servitude by means of a botanical walk through, prior to construction.
- Species to be translocated shall be identified prior to construction.
- Permits for removal of protected species must be obtained from the relevant authority should such species be affected by construction activities.
- Impacts on natural indigenous vegetation shall be minimised by keeping clearance of indigenous vegetation to the minimum, using existing disturbed and transformed areas for site camps, access, parking, stockpiling and other damaging activities, and by adhering to the specifications provided in this EMPr.
- Herbicide use shall only be allowed with the approval of Eskom and in accordance with Eskom’s Standard for the safe use of pesticides and herbicides (ESKASAAL0).

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least disruption possible to natural habitat</td>
<td>Minimal disturbance to vegetation where such vegetation does not interfere with construction and operation of the distribution line</td>
</tr>
<tr>
<td>Protection of valuable plant species</td>
<td>No litigation due to removal of vegetation without necessary permits</td>
</tr>
<tr>
<td></td>
<td>Successful rehabilitation of indigenous vegetation, free of alien plants</td>
</tr>
<tr>
<td></td>
<td>No signs of vegetation dying due to leaching of herbicides one year after completion of the contract</td>
</tr>
</tbody>
</table>

5.2.5 *Cultural heritage resources*

No structures or heritage sites requiring permits have been identified within the study area, however the potential impact of excavations for the footprint Marallaneng Substation, on the subterranean fossil bearing strata, is highly likely, and the following is recommended:

- A palaeontologist with experience of the Permian Extinction Zone must be appointed to have a watching brief to monitor excavations during establishment of the Substation platform.
- The palaeontologist must be permitted by the relevant heritage authority to collect, rescue and record fossils during these excavations.
- Should a heritage artefact is uncovered during construction, work must stop and the South African Heritage Resources Association (SAHRA) must be informed. SAHRA will advise on how to proceed.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection of heritage artefacts</td>
<td>Management of new discoveries in accordance with the recommendations of SAHRA</td>
</tr>
</tbody>
</table>
Vegetation clearing to allow for site establishment as well as construction purposes will be required. The object of vegetation clearing is to trim, cut or clear the minimum amount of vegetation necessary for the safe mechanical construction and electrical operation of the distribution line. Vegetation clearing may also significantly contribute to visual impacts and various additional measures are stipulated in Section 5.7.8 (Aesthetics).

- Prior to the start of construction, a survey of the final tower positions along the servitude is to be conducted by a qualified vegetation specialist familiar with the surrounding area. A protocol is to be developed, where necessary, for the removal and relocation of any affected rare, threatened, protected or otherwise valuable plants located during this survey. Sensitive and “no go” areas are to be marked.
- All areas marked as “no-go” areas shall be respected as such.
- Construction areas shall be cleared in accordance with Eskom’s Standard for vegetation clearance and maintenance within overhead power line servitudes (EPC 32-247) (TRMAGAAZ7).
- Consideration is to be given to vegetation stripping guidelines to mitigate aesthetic impacts, i.e. should be done in a manner where the edges are organic (non-geometric) or curvilinear rather than straight or sharp edged.
- Vegetation clearing in wetlands shall require a detailed method statement.
- Alien invasive plants should be hand pulled or cut and the stump poisoned from cleared areas. Ongoing control of alien invasive plants during the construction period shall be undertaken in cleared areas.
- The Contractor shall not clear the entire 31 m wide servitude or 80 m x 80 m substation footprint but clear only what is actually required for construction, access and operations.
- Any additional areas to be cleared outside the development footprint shall be negotiated with the relevant landowners and approved by Eskom and the ECO.
- Clearance that is required to take place within and adjacent to cultivated areas shall be in consultation with the relevant landowners and approved by Eskom and the ECO.
- Vegetation should not be cleared to a height less than 100 mm, ensuring that the groundcover still remains. No further vegetation may be removed.
- No bulldozers may be used. Instead, vegetation must be removed by hand.
- The area of exposed ground (i.e. exposed soil) must be minimised at any point in time to reduce the risk of erosion and dust pollution.
- All cleared areas shall be stabilised as soon as possible. The Contractor shall keep the soil in any unstaibilised areas wet in order to control wind-blown dust and erosion.
- Cleared vegetation shall be removed from the site by the Contractor and disposed of at an appropriate licensed waste disposal site. No vegetative matter shall be burnt or removed for firewood under any circumstances by any Eskom employee or contractor.
- Topsoil is to be stripped from areas in which construction is to take place. The topsoil must be separated from the subsoil during excavation activities, and stockpiled in a designated stockpile area. Excess subsoil must be disposed of at an approved spoil site, due to its unsuitability for plant growth. The topsoil stockpile will be used during the rehabilitation phase to provide a suitable medium for the germination of seeds and establishment of stored plants.
- Rehabilitation and re-vegetation of cleared areas shall be done as soon as possible after the completion of construction. This is important to prevent topsoil loss and particularly to prevent colonisation by alien invasive plant species.
The Contractor for vegetation clearing shall comply with the following:

- The Contractor must have the necessary knowledge to be able to identify different species.
- The Contractor must be able to identify declared weeds and alien species that can be totally eradicated.
- The Contractor must be in possession of a valid herbicide applicator’s licence.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection of valuable plants and vegetation</td>
<td>Valuable plants are identified prior to construction and protected by avoidance or translocation. No go areas are marked and respected.</td>
</tr>
<tr>
<td>Minimise possibility of erosion due to removal of vegetation</td>
<td>Areas are successfully re-vegetated. No visible erosion scars 12 months after completion of the contract due to vegetation removal.</td>
</tr>
<tr>
<td>Alien invasive plants control</td>
<td>Servitude and disturbed areas are free of alien invasive plants.</td>
</tr>
</tbody>
</table>

5.4 Earth works

5.4.1 Topsoil clearing management

- Where areas are to be cleared, topsoil shall be collected and retained for the purpose of re-use later to rehabilitate disturbed areas.
- Topsoil is to be handled twice only – once to strip and stockpile, and once to replace and level.
- The stockpile height of topsoil must not exceed 2 m unless approved by the ECO.
- Stockpile topsoil stripped from different sites separately, as reapplication during rehabilitation must preferably be site specific.
- Protect topsoil stockpiles from erosion by wind and water.
- Do not compact topsoil in any way.
- Ensure that topsoil is at no time buried, mixed with spoil (excavated subsoil), rubble or building material, or subjected to compaction or contamination by vehicles or machinery. This will render the topsoil unsuitable for use during rehabilitation.
- Retained topsoil shall be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion. Where required, re-vegetation can also be enhanced using a vegetation seed mixture.

5.4.2 Excavations and earthworks

- Excavations must be undertaken carefully, incorporating appropriate drainage.
- Excavations must not stand open for longer than two days, where possible (maximum of four days). Excavations should preferably be opened and closed on the same day.
- Where excavations pose a risk to human or animal safety, they must be adequately cordoned off to prevent accidents.
- Wild animals that are found trapped in excavations must be assisted provided there is no risk to workers’ safety.
- Excavation must be programmed to take place once the required materials are on site. This facilitates the immediate laying of services and/or construction of subsurface infrastructure and minimises open excavations.
Where construction through wetlands and water courses is required (as per the approved site layout plan), the contractor must return the profile of the wetland/drainage line to one similar to the pre-construction profile. No ridge or channel feature may remain.

During construction through a wetland, the majority of the flow of the wetland must be allowed to pass downstream (i.e. no damming must be allowed to take place). In-stream diversions must be used rather than the construction of new channels.

5.4.3 Blasting

In order to construct the substation, the initial phase of earthworks will need to level a platform for the infrastructure. As the site is located on the top of a small hill, there will be cut and fill earthworks required. The cutting areas are where blasting may be required. The following mitigation measures should be considered prior to any blasting taking place:

- Preparation of a detailed drilling and blasting methodology statement for the project, with a blast design revised for each blast to be done. This design must consider the normal legal requirements, with specific attention to the following as well: drilling procedures, charging, stemming and initiation procedures. For each blast, the monitoring positions must be indicated and the expected levels of ground vibration and air blast calculated.
- No blasting is to be done during inclement weather (i.e. during low cloud cover, rain or misty conditions). This is because the effects of blasting may be enhanced and result in excessive levels.
- Blasts must be carefully planned and laid out for each day’s blasting so that there is no material left over that must be destroyed.
- Blasts must be done in blocks, i.e. no drilling and blasting of the whole area at once.
- Cover blasting is not anticipated but if small diameter/jackhammer drilling is to be done, it must be covered with at least a 2 m cover. This will control air blast very effectively if done correctly to almost no air blast at all.
- Charges must be pre-calculated not to exceed the mass used in the blasting specialist report. The maximum allowable charges are defined in the designs. Any changes from this will require a complete re-evaluation.
- No detonating cord initiation system or shock tube initiating system should be used. Initiation systems must be electronic systems to facilitate a silent blast situation.
- The use of a drill diameter smaller than the 76 mm drill hole used in this report can be considered. Charging with cartridges instead of bulk products will help control the charge masses loaded in the blast holes.
- Adhere to proper stemming rules with the appropriate stemming lengths to be used. All blast holes should not have a stemming length of less than 2.6 m. In the event of jackhammer drilling and blasting, blasts must be covered with at least a 2 m cover. This will control air blast very effectively if done correctly to almost no air blast at all.
- Blast holes must be stemmed after charging with proper crushed aggregate of correct size (size +8-12) for the blast hole diameter used.
- The blaster must keep proper records of each blast hole, charging mass, length and stemming lengths.

5.4.4 Spoil

- A photographic record (before construction and after rehabilitation) must be kept of all spoil sites for monitoring purposes.
- The reinstated construction site, used as a spoil area for excess trench excavation material, must only have a net increase in ground level of less than 200 mm. The reinstated site must be lightly compacted and made free-draining.
Excess spoil material may also be used to replace unsuitable local material (e.g. bedding for paving foundations).

Spoil areas must not negatively affect surface drainage, and they must not alter the topography to the extent that they become visually intrusive.

The use of spoil sites for the disposal of hazardous or toxic wastes is not permitted.

No spoil site may be located within 100 m of any watercourse or in sensitive areas.

Spoil must be positioned on the higher side of a disturbed area, and above a 1:50 year flood line wherever possible.

Spoil must be stored in such a way and in such a place that it will not cause the damming up of water, erosion gullies, or wash away itself.

No slopes steeper than 1(V):3(H) are allowed.

Spoil sites must be approved by the ECO, in the form of an amended construction site layout plan. The following information is required for approval:
- The location, description and access to proposed sites.
- The quantity of material to be spoiled.
- The type of material to be spoiled.
- The proposed method of spoiling.
- A proposal for the reinstatement and rehabilitation plan, including the final profile.
- Written approval from the landowner/relevant authority that material may be spoiled on the land in question, subject to conditions.

Spoil areas must be re-vegetated and rehabilitated after the construction phase.

Excess spoil is to be disposed at the nearest municipal land fill site and records of this disposal must be provided to the ECO.

### 5.4.5 Shaping and trimming

- The contractor must execute bulk (shaping) and fine (trimming) earthworks according to the design (aimed at the prevention of soil erosion, of efficient stormwater control, of the eventual reestablishment of vegetation and of ultimately achieving aesthetically acceptable landscapes).
- The shaping and trimming operations must be planned to allow for topsoil application: final trimmed levels must make provision for the specified depth of reapplied topsoil.
- Trimmed surfaces must be left slightly rough to facilitate topsoil binding for the natural establishment of vegetation.
- Where machine operations are not practicable, trimming must be carried out using hand tools.

### 5.5 Waste Management

#### 5.5.1 Solid waste

- The Contractor shall supply waste collection bins where these are not available and all solid waste collected shall be disposed at a licensed waste landfill or sold to a recycling merchant for recycling.
- A certificate of disposal shall be obtained by the Contractor and kept on file.
- The disposal of waste shall be in accordance with all relevant legislation.
- Under no circumstances may solid waste be buried or burned on site.

#### 5.5.2 Construction rubble disposal

- The Contractor shall dispose of all waste material in an appropriate manner and at licensed waste disposal facilities within the region.
- No waste material including concrete rubble and packaging material may be buried or burned on site.
No material shall be left on site that may harm humans or animals. Broken, damaged and unused spares such as porcelain, glass, nuts, bolts, washers and insulators shall be picked up and removed from site.

**Management Objectives** | **Measurable Targets**
--- | ---
To keep the servitude neat, clean and tidy | No construction rubble or refuse left lying around on site
Disposal of construction rubble and refuse in an appropriate manner | No visible concrete spillage within the servitude or other areas
Minimise landowner complaints | No complaints from landowners

### 5.5.3 Liquid waste

- Suitable, sufficient and conveniently located sanitation facilities must be provided as per the approved construction site layout plan.
- Chemical toilets must be regularly emptied and serviced.
- The contractor is entirely responsible for enforcing their use and for maintaining all toilets in a clean, orderly and sanitary condition to the satisfaction of the ECO.
- Sewage must be disposed of at a licensed wastewater treatment site and may under no circumstances be dumped in the bush or buried.

### 5.5.4 Hazardous waste

- The Contractor shall comply with all national, regional and local legislation with regard to the storage, transport and use of hydrocarbons, chemicals, solvents and any other harmful and hazardous substances and materials.
- A register shall be kept on site of all substances and be available for inspection at all times.
- The Contractor shall ensure that personnel handling hazardous substances have been educated in terms of the correct handling, use and disposal thereof.
- All potentially hazardous and non-degradable waste shall be collected and removed to a licensed hazardous waste site. A certificate of disposal shall be obtained by the Contractor and kept on file.
- Leaking equipment shall be repaired immediately or be removed from site to facilitate repair.
- Empty containers in which hazardous substances were kept are to be treated as hazardous waste.
- Cement shall not be mixed directly on the ground. Protective boards shall be used.
- No vehicles, machinery or containers shall be washed directly onto the ground after depositing cement into foundations. They should be washed off site where proper containment facilities are available for the wash water.
- Any spilled wet cement shall be cleaned up immediately.
- Workshop, equipment, storage and batching areas shall be monitored for spills and all spills shall be cleaned and remediated to the satisfaction of the ECO.
- The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site.

The following shall apply to hazardous substance spills:

- All spills of hazardous substances must be reported to the ECO.
- All contaminated soil/yard stone shall be removed and be placed in containers. Contaminated material can be taken to one central point for bio-remediation.
- A clean up kit must be available so that smaller spills can be treated on site.
A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise are unavailable on site.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>To practise good housekeeping and legal compliance with respect to hazardous substances</td>
<td>Hazardous materials correctly stored in bunded areas</td>
</tr>
<tr>
<td></td>
<td>Emergency procedure in place for spills</td>
</tr>
<tr>
<td>Correct disposal of hazardous waste</td>
<td>No visible evidence of incorrect disposal</td>
</tr>
<tr>
<td>Minimise accidents and spills</td>
<td>Infrequent reports of spills incidences</td>
</tr>
</tbody>
</table>

### 5.6 Site Management

#### 5.6.1 Erosion Protection

- All areas susceptible to erosion must be protected to ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and construction area.
- Natural trees, shrubbery and grass species must be retained, wherever possible.
- Vehicular or pedestrian access must not be permitted into areas beyond the demarcated boundary of the construction area.
- Only light equipment must be used for access and deliveries into areas of unstable soils, in areas where erosion is evident, and at stream and river embankments.
- In sensitive areas, measures such as a drainage layer, well pointing, shoring and concrete encasement of the drainage infrastructure must be undertaken.
- Erosion must occur where excavations are in loose sand and/or swamp areas.
- Erosion problems must be repaired on a progressive basis throughout the contract.
- Slopes steeper than 1(V):3(H) or slopes where the soils are by nature dispersive or sandy, must be stabilised (in consultation with the ECO). One or more of the following methods may be required:
  - Topsoil covered with a geotextile, plus a specified grass seed mixture.
  - A 50:50 by volume rock:topsoil mix 200 mm thick, plus specified grass seed mixture.
  - Logging or stepping (logs placed in continuous lines following the contours).
  - Earth or rock-pack cut-off berms.
  - Benches (sand bags).
  - Packed branches.
  - Ripping and/or scarifying along the contours.
  - Stormwater berms.
- Slopes of watercourse diversions (which must have the appropriate authorisation from Department of Water and Sanitation) must be protected with one or more of the following (in consultation with the ECO):
  - Sandbags.
  - Reno mattresses.
  - Plastic liners and/or coarse rock (undersize rip-rap).
- During the course of construction, the ECO may identify additional slopes in need of stabilisation and will specify actions in terms of the most appropriate approved method and technology.
5.6.2 Pollution control

- The storage for any substance, which causes or is likely to cause pollution must not be located within the 1:100 year flood line, or within a horizontal distance of 100 m (whichever is greater) of a watercourse, drainage line or identified wetland.
- Waste or foreign material must not be dumped into any watercourses or wetland areas.
- Watercourses and wetland areas must not be used for swimming, bathing, or the cleaning of clothing, tools or equipment.
- The discharge of water containing polluting matter or visible suspended materials, fines and sediments directly into drainage lines or wetlands must be prevented.
- Unpolluted water/runoff must be deflected away from any dirty area.
- No stormwater must enter any drainage installation for the reception, conveyance, storage and/or treatment of sewage.
- Special care during rainy periods must be taken to prevent the contents of sumps and drip trays from overflowing.
- Before any water is permitted to enter natural drainage lines, the quality of the water must comply with the South African Water Quality Guidelines (Department of Water Affairs and Forestry, 1996) and the Standard Requirements for Effluent and Waste Water.
- Watercourses must be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials, etc.
- The contractor must ensure that an emergency preparedness plan is in place for implementation in the case of a spill or substances that can be harmful to an individual or the receiving environment.
- The contractor must ensure that accidental oil or fuel spills or leakages (other than those classed as emergency) are immediately contained and cleaned up.
- Oil or fuel spills must not be hosed into a storm water drain or sewer, or into the surrounding natural environment.
- Small oil or fuel spills must be cleaned with an approved absorbent material, such as 'Drizit' or 'Spill-sorb'.
- Oil or fuel spills must be contained in water using an approved oil absorbent fibre.
- Soil contaminated by oil or fuel must be treated using one of the following approved methods, as per instruction of the ECO:
  - The soil to the depth of the contamination must be removed and disposed at a registered hazardous waste disposal site.
  - The soil to the depth of the contamination must be removed and regenerated using approved bio-remediation methods.
- All on-site operations that involve the use of cement and concrete must be carefully controlled.
- Cement and concrete mixing must be limited to single sites, where possible.
- Plastic trays or liners must be used when mixing cement and concrete (cement and concrete must not be mixed directly on the ground).
- All visible remains of excess cement and concrete must be disposed after the completion of tasks. Solid waste concrete must be treated as inert construction rubble, but wet cement and liquid slurry, as well as cement powder must be treated as hazardous waste.
- Water and slurry from cement and concrete mixing operations must be contained and directed into a settlement pond or sludge dam for later disposal.
- Trucks delivering concrete may be washed only within designated wash bays equipped with runoff containment and direction of wastewater into a settlement pond or sludge dam for later disposal. Trucks must deliver bags and aggregate along existing access roads/tracks.
5.6.3 Fire prevention

No open fires shall be allowed on site under any circumstance. At all times the contractor must abide by Eskom’s Standard for Fire Risk Management (EST 32-124)

The Contractor shall:

- Take reasonable and active steps to avoid increasing the risk of fire through his activities on site. Accidental fires should be prevented through proper sensitisation of the contractors and their workers towards the associated risks, dangers and damage of property.
- Ensure that no fires are lit on site under any circumstances. The use of open fires for cooking of food, etc. by construction personnel should be strictly prohibited. Enclosed areas for food preparation must be provided.
- Report any fires that occur to the ECO as soon as possible.
- Ensure that there is basic fire-fighting equipment available on site at all times.
- Educate specific members of the construction force regarding the location and use of fire-fighting equipment.
- Restrict smoking activities to demarcated smoking areas.
- Ensure that an emergency preparedness plan is in place in order to fight accidental veld fires should they occur. The adjacent land owners/users/managers should also be informed and/or involved.
- Prohibit the use of branches of trees and shrubs for fire-making purposes.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimise risk of runaway veld fires</td>
<td>No veld fires started by the Contractor’s work force</td>
</tr>
</tbody>
</table>

5.6.4 Transport of equipment

- All equipment moved onto site or off site during a project is subject to legal requirements as well as Eskom’s specifications for the transport of such equipment. 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.
- 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.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe handling and transport of equipment</td>
<td>All equipment delivered to site intact</td>
</tr>
<tr>
<td>Safe handling and transport of hazardous substances</td>
<td>No spillage of hazardous substances</td>
</tr>
</tbody>
</table>

5.6.5 Servicing of vehicles

Servicing of vehicles in the field, or onsite is strictly prohibited. Only emergency repairs shall be allowed on site and a drip tray shall be used to prevent oil spills. All vehicles shall be serviced in the designated area inside the Contractor’s campsite. In the event of a vehicle breakdown in the field, any oil spills shall be cleaned up immediately. The following shall apply:

- All contaminated soil shall be removed and be placed in containers.
Contaminated soil shall be taken to one central point at the Contractor’s campsite where bio-remediation can be done.

A clean up kit must be available so that smaller spills can be treated on site.

A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise are unavailable on site.

The area around the fuel storage drum at the Contractor's campsite shall also be remediated upon completion of the contract.

All old parts, packaging, oil and the like shall be disposed of in the correct manner and in a proper area designated for such waste materials. Under no circumstances shall such waste be buried on site.

All spills must be reported to the ECO.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevent pollution of the environment</td>
<td>No pollution of the environment</td>
</tr>
</tbody>
</table>

5.6.6 Management of unused/old equipment

- All unused/old equipment shall be stored in such a way as to prevent pollution of the environment.
- Oil containing equipment shall be stored to prevent leaking or be stored on drip trays should such equipment already be leaking.
- All scrap steel shall be stacked neatly and any disused and broken insulators shall be stored in containers.
- Once material has been scrapped and a contract has been placed for removal, the Contractor shall ensure that any equipment containing pollution-causing substances is removed in such a way as to prevent spillage and pollution of the environment.
- The Contractor shall be equipped to contain and clean up any pollution causing spills.
- Disposal of unusable material shall be at a licensed waste and/or hazardous waste landfill site and a certificate of disposal shall be obtained and copied to Eskom.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>To prevent illegal dumping and pollution of the environment</td>
<td>All materials removed after construction completed</td>
</tr>
<tr>
<td></td>
<td>No complaints from landowners</td>
</tr>
</tbody>
</table>

5.6.7 Safety and security

The Contractor shall ensure the implementation of the following safety and security measures:

- Ensure compliance with the Occupational Health and Safety Act (No 85 of 1993).
- Clearly mark dangerous areas and restrict access to these areas.
- Ensure that no person under the influence of alcohol or narcotic substances is allowed to work on the site.
- Ensure adequate signage is provided along affected main roads.
- Ensure that employees are aware of the telephone numbers of emergency services, where these are readily available, and the procedure to be followed in the event of an emergency.
- Workers employed and vehicles used should be readily identifiable as construction staff. Workers may be obliged to wear identity cards or corporate clothing to assist the community in identifying them as construction workers.
- Access control to construction sites must be in place as appropriate.
- All construction materials and equipment to be safely and securely stored.
Should a boundary fence be temporary relocated during construction, this must be reinstated to the satisfaction of the landowner.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
</table>
| Keep people and property safe, secure and injury/damage free | No accidents, incidents or compromise of safety  
| | No complaints from affected parties on or around the site |

### 5.7 Social issues and their control

#### 5.7.1 Disruption of farming activities and loss of crops

In order to minimise disruption to farming activities and crop loss, the Contractor shall:

- Liaise with the land owner/farm managers well in advance of the advent of construction, in order to provide sufficient time to plan their agricultural activities.
- As far as possible, structure the timing of activities to falls within the post-harvest, pre-planting season, when fields are lying fallow.
- Locate working and storage areas outside of cultivated areas, where possible, and with the approval of the landowner.
- Care must be taken not to damage irrigation equipment, lines, channels and crops. The position of all pipelines and irrigation lines in the vicinity of a site must be obtained from landowners or the local community and clearly marked. Where required, such lines shall be deviated.
- Encourage landowners/farm managers to move livestock away from the proposed construction area for the duration of the construction of the distribution lines.
- Alternative livestock watering points shall be provided if required.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal interference with farming operations</td>
<td>No complaints received from farm owners/managers</td>
</tr>
</tbody>
</table>

#### 5.7.2 Claims for damage

- Construction in cultivated fields is preferable during the months when the lands are fallow. The farmer should be consulted in advance to determine the best time for construction. Access to private property adjacent to the approved power line must comply with the Eskom’s Standard for the Access of Farms (TPC 41-340).
- Should damage to crops ensue during construction, this shall be reported immediately by the Contractor to the ECO.
- The ECO shall keep a record of the date, time and type of damage, as well as the reason for the damage, including a photographic record, to ensure that the responsible party is held liable.
- All claims for compensation emanating from damage should be directed to the ECO for appraisal.
- The Contractor shall be held liable for all unnecessary damage to the environment and crops.
- The Contractor shall keep a register of all complaints from landowners, Grid staff and community. The responsible party shall handle all complaints and/or claims immediately to ensure timeous rectification/payment.
Management Objectives | Measurable Targets
--- | ---
Minimise damage to crops and ensuing complaints from landowners and communities | No complaints or claims from the landowner or communities
Prevent litigation due to outstanding claims | All claims investigated and settled within one month
Completion of the contract on time and all release forms signed | No litigation due to unsettled claims

5.7.3 Sanitation and ablution facilities

- These shall be provided as specified in Section 5.1.3.
- The use of the "bush toilet" is not permitted.
- Toilets shall be serviced regularly and the ECO shall inspect toilets regularly to ensure compliance to health standards.
- Sewage from toilets shall be disposed of at a licensed waste water treatment facility and under no circumstances buried on site.

Management Objectives | Measurable Targets
--- | ---
Prevent environmental pollution | Toilets regularly and properly serviced
Provision of decent sanitation facilities for workers | No complaints received from site staff, project staff or landowners regarding sanitation

5.7.4 HIV/AIDS awareness

The Contractor shall:

- Include an HIV/AIDS awareness component in the induction programme of all construction workers coming onto site.
- Ensure adequate access to HIV/AIDS-related information and condoms, for all construction employees.

Management Objectives | Measurable Targets
--- | ---
Raise awareness and encourage prevention of the spread of HIV/AIDS | Few, if any, meaningful short-term measurable targets are available but staff attendance at induction courses can be noted

5.7.5 Interaction with affected parties

- The success of any project depends mainly on the good relations between the relevant project and construction managers and affected landowners/parties. It is, therefore, required that the ECO and the Contractor establish good relations and an open channel of communication with all affected parties along the servitude.
- All negotiations for any reason shall be between Eskom’s appointed ECO, the landowner and/or affected parties and the Contractor. No verbal agreements shall be made. All agreements shall be recorded properly and all parties shall co-sign the documentation. Furthermore, a photographic record shall be kept, for example, of access roads, and made available should affected parties institute claims. Claims instituted by affected parties shall be investigated and resolved timeously. Unnecessary delays should be avoided at all costs.
- The landowners and 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 ECO and Contractor shall be made available to the affected parties. This will ensure open channels of communication and prompt response to queries and claims.

- All contact with the affected parties shall be courteous at all times. The rights of the affected parties shall be respected at all times and all staff shall be sensitised to this.
- Importantly, the Contractor shall not be released from site until all landowners have signed off the release documentation to the satisfaction of the ECO.

### Management Objectives

<table>
<thead>
<tr>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain good relations with affected parties</td>
</tr>
<tr>
<td>No delays in the project due to interference from affected parties</td>
</tr>
<tr>
<td>All landowners release forms signed on completion of the project</td>
</tr>
</tbody>
</table>

#### 5.7.6 Dust

The Contractor shall be responsible for dust control on site:

- Limit the speed of construction vehicles on construction roads to 40 km/h.
- Clear areas for construction only immediately ahead of when they are required.
- Apply dust suppression measures, mainly through the application of water via a fan bowser or using a soil-binding agent, as indicated by weather conditions on a day-to-day basis.
- Reshaping, rehabilitating and re-vegetating cleared areas immediately once construction has been completed.
- Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.

### Management Objectives

<table>
<thead>
<tr>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site works do not cause a nuisance to other people in the area</td>
</tr>
<tr>
<td>No complaints or claims arising due to dust pollution</td>
</tr>
</tbody>
</table>

#### 5.7.7 Noise

- The Contractor shall ensure that noise levels remain within acceptable limits. This applies especially after working hours and during the night.
- The South African National Standard for noise levels (SANS 10103: The Measurement and Assessment of Environmental Noise with Respect to Land Use, Health, Annoyance and Speech Communication) must be adhered to at all times.

### Management Objectives

<table>
<thead>
<tr>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention of noise pollution</td>
</tr>
<tr>
<td>No complaints from landowners or community</td>
</tr>
</tbody>
</table>

#### 5.7.8 Aesthetics

- The site shall be kept visually and aesthetically pleasing, especially in and around the Contractor’s camp.
- All litter shall be cleared daily and waste shall be temporarily stored in bins/appropriate containers until taken off site for disposal.
- The ECO shall regularly inspect the site to ensure that it is neat and clean.
- Where required, the campsite shall be screened by the Contractor to ensure that there is no unacceptable visual intrusion in the area of the site. Screening can be done by use of shade cloth.
Dust generated by construction activities and the haulage of materials and equipment will need to be suppressed by regular wetting.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetically pleasing work areas, campsite and storage areas</td>
<td>No complaints from affected parties on or around the site</td>
</tr>
</tbody>
</table>

### 5.7.9 Infrastructure and services

- No interruptions other than those negotiated shall be allowed to any essential services.
- Any possible disruptions to essential services must be kept to a minimum and should be well advertised and communicated to landowners and surrounding communities.
- Damage to infrastructure shall not be tolerated and any damage shall be rectified immediately by the Contractor. A record of any damage and remedial actions shall be kept on site.
- No telephone lines or fences shall be dropped during the stringing operations.
- Where pipelines are found along the route, the depth of the pipes under the surface shall be determined to ensure that proper protection is afforded to such structures. All pipelines shall be clearly marked and protected. Any damage to pipelines shall be repaired immediately.
- All existing private access roads used for construction purposes, shall be maintained at all times to ensure that the local people have free access to and from their properties.
- Speed limits shall be enforced in such areas and all drivers shall be sensitised to this effect. Upon completion of the project, all roads shall be repaired to their original state.
- Care must be taken not to damage irrigation equipment, lines, channels and crops. The position of all pipelines and irrigation lines in the vicinity of a site must be obtained from landowners or the local community and clearly marked. Where required, such lines shall be deviated.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal disruption and damage to infrastructure and services</td>
<td>No complaints from Authorities, landowners, and communities regarding disruption of services</td>
</tr>
</tbody>
</table>

### 5.7.10 Enhancement of local economic benefits

The Contractor shall:

- As far as possible, employ local staff during construction, where applicable.
- Ensure recruitment measures are aimed particularly at construction workers classified as designated employees in terms of the Employment Equity Act (black people, as defined in the Act, women, and disabled people).
- As far as possible, trade locally during operation.
- Prioritise sub-contracting to local Small and Medium Enterprises (SMEs) and Affirmative Business Enterprises (ABEs) where possible.
- The overall environmental management approach must include provision for the use of local contractors as far as possible.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhancement of local economic benefits</td>
<td>Number of local individuals employed Number of ABEs and SMEs employed</td>
</tr>
</tbody>
</table>
5.7.11 Stringing operations

- All necessary scaffolding and/or protection measures must be installed to prevent damage to structures or high yield agricultural crops.
- All structures supplying services, such as telephone and smaller power lines, as well as national, provincial and local/farm roads, shall be safeguarded by measures to prevent disruption of services.
- The Construction Manager shall liaise with the Local Municipality Traffic Departments regarding the requirements for the stringing of conductors across roads.
- The Construction Manager shall liaise with the Local Municipality Traffic Departments to display notification of road closure prior to the closures.
- The Construction Manager shall, where possible, schedule stringing of conductors and associated road closures outside of peak traffic hours.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevent damage to high yield crops, infrastructure and sensitive vegetation</td>
<td>No claims as a result of damage to crops, infrastructure and sensitive vegetation</td>
</tr>
<tr>
<td>Prevent disruption of services</td>
<td>No complaints or claims as a result of disruption of services</td>
</tr>
</tbody>
</table>

5.8 Specialists’ recommendations

In addition to the above-mentioned standard construction mitigation measures, the following specialists’ mitigation measures must be implemented.

5.8.1 Impacts on vegetation, terrestrial fauna and wetlands

- Construction should preferably take place during the winter months to minimise the risk of sediment, debris and other pollutants being washed into the wetland during high rainfall events.
- To minimise the impacts on vegetation, it is recommended that the proposed power line is placed adjacent to the R26.
- Keep vegetation clearance to a minimum.
- Sensitive areas should be demarcated and avoided.
- Protected plant species should be rescued.
- A walk down should precede construction to identify protected plants, flora of conservation concern, sensitive faunal habitats and wetlands.
- Open areas that are no longer required for construction, should be seeded (with locally sourced seeds) or mulched to limit erosion and encourage vegetation growth.
- Collection, hunting or harvesting of any plants or animals should be strictly forbidden.
- Fuel wood collection should not be allowed on or around site.
- Avoid fencing off the Eskom servitude as this will impede the movement of large mammals.
- Vehicles may not drive through these streams, drainage lines and any other water course, even if dry, unless on an existing road or bridge.
- No temporary facilities (storage or dwellings, etc.) may be erected within 100 m of a stream, river or drainage line.
- No temporary facilities may be erected on any ridge.
- No temporary facilities may be erected within 500 m of a wetland.
5.8.2 Impacts on avifaunal species

- An avifaunal ‘walk down’ will identify any particularly sensitive areas requiring special attention. The normal suite of environmental good practices should be applied, such as ensuring strict control of staff, vehicles and machinery on site and limiting the creation of new roads as far as possible.
- Ensure that the new infrastructure is built bird friendly and results in no additional impact on birds in the area.

5.8.3 Impacts on cultural heritage aspects

- A suitably qualified heritage practitioner should undertake a ‘walk-down’ of the final selected power line route and all activity areas (tower positions, access roads, construction camps, materials storage areas, etc.) prior to the start of any construction activities and assess direct impacts on any heritage resources.
- A suitably qualified heritage practitioner must undertake a full Phase 1 Heritage Impact Assessment prior to the start of any construction activities.
- A palaeontologist with experience of the Permian Extinction Zone must be appointed to have a watching brief to monitor excavations during establishment of the Substation platform. The palaeontologist must be permitted by the relevant heritage authority to collect, rescue and record fossils during these excavations.
- Indirect visual impacts on formally protected heritage resources should be avoided through the sensitive placement of project infrastructure.
- Indirect visual impacts on such heritage resources should be avoided through the sensitive placement of project infrastructure.
- Infrastructure proposed in the following locations should be avoided:
  - Where it will be out of character or disruptive of the sense of place.
  - Where it will break the skyline on a scenic landscape.
  - Along scenic tourist routes. Where alignment is required adjacent to roads, place the power line as close as possible to the road so that views are least affected (“by looking under the power line at source on the road”).
  - In a sensitive environment as defined in the heritage impact assessment report (see Appendix D of the BAR).
  - In any area, property, adjacent to sites of cultural or social importance such as historical sites proclaimed in terms of the NHRA, graveyards, public open spaces and visual corridors or gateways.
- No power line infrastructure may be placed within 50 m of a grave or burial ground, unless recommended otherwise by a heritage practitioner.
- No power line infrastructure may be placed within 50 m of archaeological sites, unless recommended otherwise by a heritage practitioner.
6. REHABILITATION PHASE

The concept of progressive rehabilitation is to be implemented throughout the life of the project. As soon as work in one area is complete the rehabilitation of that site is to commence. This will involve returning the condition of the disturbed areas to a state that they were in before the project began, or better. The Project Engineer will be responsible for the monitoring of rehabilitation.

Unless specified otherwise, the Contractor shall be held responsible for the re-establishment of vegetation within the construction site boundaries for all areas disturbed during construction.

6.1 General Specifications

- The principle of progressive reinstatement must be followed wherever possible. This includes the reinstatement of disturbed areas on an ongoing basis, immediately after the specified construction activities for that area are concluded.
- As soon as construction is finished in an area and a construction site or lay down area is vacated, the disturbed areas must be rehabilitated by landscaping, levelling, topsoil dressing, alien plant eradication and vegetation establishment, including the planting of replacement trees where trees have had to be removed.
- Erosion control measures must be implemented and the effectiveness thereof must be monitored and corrected where necessary. Environmental damage due to the failure of erosion control measures must be rehabilitated to a state agreed with DEA.

6.2 Removal of Structures and Infrastructure

- All construction plant, equipment, signage, storage containers, temporary fencing and gates, temporary services, fixtures, foundations and any other temporary construction infrastructure must be cleared from the construction site.
- Access roads utilised during construction (which are not earmarked for closure and rehabilitation) must be returned to a usable state and/or a state no worse than prior to construction.

6.3 Stockpiles, Inert Waste and Rubble

- All stockpiles and surplus material must be transported to an approved location off site.
- After the stockpiled material has been removed, the site must be re-instated and rehabilitated.
- The site must be cleared of all inert waste and rubble, including surplus rock and foundations.
- Excess spoil and inert rubble must be transported to waste sites as approved by the Project Engineer and ECO.
- All domestic waste must be removed and disposed at the nearest municipal waste disposal facility.

6.4 Hazardous Waste and Pollution Control

- All fuel stores, hazardous substance stores, hazardous waste stores and pollution control sumps must be removed from site.
- Pollution containment structures must be removed from site.
- All sanitation infrastructure and wastewater disposal systems must be removed from site.
6.5 Final Shaping

- All excavations must be backfilled with in situ material.
- All dangerous excavations must be made safe by backfilling and grading as required.
- The reinstated construction site must be graded to ensure free flow of run-off and to prevent damming of water.
- The backfilling of excavations must be programmed so that subsoil is deposited first, followed by topsoil. The layers must be compacted as part of final shaping.
- Backfilled areas must be monitored for subsidence (as the backfill settles) and depressions filled using available material.
- All disturbed areas must be shaped to blend in with the surrounding landscape.
- No excavated material or stockpiles must be left on site and all material remaining after backfilling must be smoothed over to blend in with the surrounding landscape.
- The site must be monitored for signs of erosion and remedial action taken where there are problems.

6.6 Topsoil Replacement and Soil Amelioration

- Topsoil must be replaced prior to the rainy season or any expected wet weather conditions.
- Stockpiled topsoil must be replaced and redistributed, together with herbaceous vegetation, overlying grass and other fine organic matter in all disturbed areas of the construction site, including temporary access routes and roads.
- Topsoil must be replaced to the original depth (i.e. as much as was removed prior to construction).
- Topsoil must be replaced in the same area from where it was stripped. If there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be brought from other areas (this must be approved by the ECO).
- Topsoil suspected to be contaminated with the seed of alien vegetation must not be used.
- Imported topsoil must be sprayed with specified herbicides (approved by the ECO).
- Topsoil not utilised must be shaped in an acceptable manner to blend in with the local surrounding area.
- After topsoil placement is complete, available stripped vegetation must be spread randomly by hand over the topsoiled area.
- In the event that no topsoil is available on site prior to construction, and thus no topsoil is available for rehabilitation, the following ameliorative action must be undertaken (in consultation with the ECO):
  - The soil to a depth of 200 mm must be sampled in all areas allocated for grass planting and the samples sent for soils analysis to determine the type of fertiliser and rate thereof to be applied.
  - The necessary soil ameliorants as indicated by soil tests must be added to and worked into the soil.
  - After the application of fertilisers, a waiting period of six to eight weeks is required prior to the execution of planting and/or grassing.
6.7 Planting

- All planting work must be undertaken by a suitably qualified Contractor.
- The sourcing of seed or other plant material used for vegetation establishment must be from within 50 km radius of the site and within the bio-climatic region.
- The reinstatement of disturbed areas with locally indigenous herbaceous vegetation must be conducted progressively.
- In moist areas, re-vegetation must include hygrophilous grassland or reed bed, and in dry areas indigenous runner grasses must be used.
- The use of fertilisers must be carefully controlled by the ECO. No fertiliser must be used in the re-vegetation process near watercourses or wetlands areas.
- If possible, reseeding and replanting must occur just prior to or during the wet season. If planting and reseeding occurs in a dry period, it may be necessary to irrigate plants to ensure their successful establishment.

6.8 Grassing

- Grassing must be undertaken by a suitably qualified contractor.
- Affected areas must be grassed using the method specified on the plant plans.
- Affected areas must be trimmed to be grassed to the required level.
- Sodding may be done at any time of the year, but seeding must be done during summer when the germination rate is better.
- Hydro-seeding with a winter mix will only be specified where re-grassing is urgent, and cannot wait for the summer.
- Within terrestrial, non-wetland areas, indigenous runner grasses must be used, such as *Stenotaphrum secundatum*, *Dactyloctenium australe* and *Cynodon dactylon*. Exotic invasive grasses, such as Kikuyu (*Pennisetum clandestinum*) must not be used.
- In wet areas, hygrophilous grassland or reed bed must be encouraged as the final vegetation cover depending on the degree of local wetness (temporary/seasonal/permanent wetland).

6.9 Weed and Invader Plant Control

- The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the rehabilitation phase.
- The control involves killing the plants present, killing the seedlings, which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (as amended) or in terms of Working for Water guidelines.
- Removed vegetation must be disposed at the closest municipal waste disposal facility.
- Only properly trained people must handle and make use of chemical herbicides. Workers must wear protective clothing when applying the herbicides.
- Spraying must not take place in windy conditions, when the herbicide may drift onto healthy indigenous plants.
- The use of herbicides is not permitted within identified sensitive areas. The removal of weeds and invader plants within these areas must be undertaken by hand.
- Affected areas must be reinstated and rehabilitated as soon as practically possible.
6.10 Monitoring of Rehabilitated Areas

- Upon completion of all work, the ECO and Resident Engineer must survey all rehabilitated areas to ensure compliance with specifications.
- A monitoring and alien weed control programme must be implemented (by the Employer) for a minimum of one year to ensure no nick-point erosion develops in disturbed soils, wetland vegetation re-establishes and that alien weeds are controlled.
- A photographic record must be maintained.
- Monitoring should be done quarterly each year, for a minimum of one year, or until the rehabilitated areas are well established.
- Alien weed control and soil erosion will be the main items that require monitoring.

7. OPERATION AND MAINTENANCE PHASE

7.1 Road maintenance

- Use of access roads during maintenance operations will be as agreed in writing between Eskom, the relevant landowners and authorities. The agreed protocol for gaining access to private property is to be followed at all times.
- Property accesses shall be kept in a passable condition at all times.
- Conduct on-foot inspections in areas where access for vehicles is not permitted.
- All vehicles using public roads shall be licensed and in a roadworthy condition.
- Vehicles shall only be operated by suitably licensed and experienced operators.
- No member of the maintenance team shall be permitted to drive a construction vehicle under the influence of alcohol or narcotic substances.
- The public shall always have right of way on public roads.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimise damage to existing access roads</td>
<td>Management of access in accordance with the agreed protocol and law</td>
</tr>
<tr>
<td></td>
<td>No formal complaints or claims concerning access roads</td>
</tr>
</tbody>
</table>

7.2 Access control

Due to the current security situation within South Africa, landowners are uncomfortable about strangers coming onto their properties. As such, landowners shall be kept abreast of all developments and shall be kept informed about operational activities.

As far as access control is concerned, Eskom shall:

- Ensure that all maintenance staff are readily recognisable as Eskom employees, and that use is made of appropriately marked vehicles when present on or moving between properties.
- Adhere to any specifications of landowners with regard to access or use of roads.
- Ensure that appropriate signage is displayed indicating the danger of electricity and electrical infrastructure. Eskom are to educate communities (minors and adults) regarding this danger.
As far as the management of servitude gates is concerned, Eskom shall:

- Ensure that all maintenance vehicles pass through gates when crossing fences.
- Ensure that no fences are dropped (even temporarily) for the purposes of driving over them.
- Ensure that all gates within the extent of the servitude used for access to the site are kept closed and locked when not in immediate use by Eskom or its contractors.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain tight control of access to properties and minimize damage to security infrastructure</td>
<td>No complaints from affected parties on or around the site</td>
</tr>
</tbody>
</table>

7.2 Waste management and pollution control

The following restrictions or constraints shall be placed on the maintenance staff in general:

- No indiscriminate disposal of rubbish or rubble.
- No littering of the servitude and substation areas, and the surrounding areas.
- No collection of firewood.
- No interference with any wildlife, fauna or flora.
- No poaching of any description.
- No use of facilities other than toilets provided at the substations.
- Wetlands and watercourses must be protected and maintained free of any pollution as a result of operational activities.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure general respect for the environment</td>
<td>No litigation</td>
</tr>
</tbody>
</table>

7.3 Nuisance control

7.3.1 Damages to infrastructure

Should any damage occur to roads and infrastructure during maintenance activities, the nature and extent of damage should be recorded within the Complaints Register and then repaired to the written satisfaction of the landowner. It is Eskom’s responsibility to prove that maintenance activities within the servitude have not resulted in any erosion or damage of the access roads.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Securing the safe use of infrastructure and installations</td>
<td>No complaints from Authorities, landowners, and communities regarding disruption of services No litigation</td>
</tr>
</tbody>
</table>

7.3.2 Dust

The major potential source of dust emissions during the maintenance phase is vehicle-entrained dust from access/service roads. Eskom shall ensure the implementation of effective control techniques for dust sources should these be required during maintenance activities. This includes:

- Use of wet suppression (where appropriate) at maintenance work areas where surfaces are destabilised for maintenance purposes.
- Adherence to speed limits for all vehicles using the access/service roads.
7.3.3 Noise

- Eskom shall ensure that noise levels remain within acceptable limits. This applies especially after working hours and during the night.
- The South African National Standard for noise levels (SANS 10103: The Measurement and Assessment of Environmental Noise with Respect to Land Use, Health, Annoyance and Speech Communication) must be adhered to at all times.

7.4 Protection of Fauna and Flora

7.4.1 Fauna

- The maintenance staff may not harm or kill any fauna during the activities of maintaining the servitude.
- Should there be an interaction with wildlife (e.g. avifauna) it must be reported to Eskom’s Environmental Manager and the matter investigated and dealt with in an effective manner.
- Eskom shall, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to wildlife interaction, respond to the complaint and register the complaint in the Complaints Register.
- Eskom’s standard monitoring of the line’s performance once operational will detect any bird related faulting. This should be reported to the Endangered Wildlife Trust: Bird Working Group for site-specific recommendations.
- The high-risk sections of line (in terms of potential impacts on birds) should be marked as recommended by the avifaunal specialist who undertakes the walk down prior to the commencement of construction of the distribution line.
- Care should always be taken to disturb the receiving environment as little as possible. If the maintenance crews identify any breeding birds during operation of the transmission lines, these nesting sites should be avoided.
- Clearing of vegetation within the distribution line servitudes should be kept to a minimum.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal disturbance of wildlife</td>
<td>Complete record of all interaction with wildlife</td>
</tr>
<tr>
<td>Minimal bird mortalities or injury due to collisions</td>
<td>No reports of collisions</td>
</tr>
<tr>
<td>Minimise disruption to bird breeding patterns</td>
<td>Minimal disruption to birds via strict adherence to the recommendations of the avi-faunal specialist</td>
</tr>
</tbody>
</table>

7.4.2 Flora

Eskom is required to conduct maintenance along the servitude in order to ensure the continued reliable operation of the power supply. An important component is bush clearing to ensure that vegetation does not interfere with the operation of the line. With regards to the bush clearing to be undertaken, Eskom shall:
Inform landowners and the relevant authorities in advance of maintenance activities.

Ensure that all alien and invasive vegetation, as well as any trees that could grow and interfere with the power line along the centre line of the servitude are cleared on a regular basis.

Ensure that no vegetation (i.e. trees) has a vertical height greater than the horizontal distance of its base to the centre line of the servitude.

Ensure that all alien vegetation within the servitude and sub-station areas is cleared and treated with the appropriate herbicide in accordance with Eskom’s Standard for the safe use of pesticides and herbicides (ESKASAAL0).

Ensure that all vegetation that is removed is not left in situ, but is removed from site to an appropriate disposal site.

Implement an environmental monitoring programme, the aim of which should be ensuring long-term success of rehabilitation and prevention of environmental degradation.

<table>
<thead>
<tr>
<th>Management Objectives</th>
<th>Measurable Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance of servitude to ensure reliable operation of the power supply</td>
<td>Continued, reliable operation of the distribution line</td>
</tr>
</tbody>
</table>

7.4.3 Alien Invasive Species Control

- Eskom is responsible for keeping the project area free of alien vegetation as required in terms of the Conservation of Agricultural Resources Act 1983 (Act 43 of 1983).
- Eskom must monitor all sites disturbed by operational activities for colonisation by weeds, exotics or invasive plants, to be controlled as they emerge.
- The control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion.
- Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) or in terms of Working for Water guidelines.
- Removed vegetation must be disposed of at the closest municipal waste disposal facility.
- Only properly trained people must handle and make use of chemical herbicides and workers must wear protective clothing when applying the herbicides.
- Spraying must not take place in windy conditions, when the herbicide may drift onto healthy indigenous plants.

7.5 Emergency Preparedness

The project proponent must compile and maintain environmental emergency procedures to ensure that there will be an appropriate response to emergency incidents that will cause environmental impacts, such as:

- Accidental discharges to water and land due to accidents or spillages.
- Accidental veld or forest fires.

The Employer must report any incidents to the authorities and undertake remedial actions as required in terms of Section 28 of NEMA.

7.6 Monitoring during operation

In order to ensure environmental sustainability, the following is to be monitored during operation by Eskom’s designated Environmental Manager. Where problems are encountered,
they are to be assessed and rectified as co-ordinated by the relevant Eskom Environmental Manager, with specialist assistance where required.

<table>
<thead>
<tr>
<th>Operational Aspect</th>
<th>Monitoring Tool to be Utilised</th>
<th>Indicators</th>
<th>Proposed Frequency and Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetation and Soils</td>
<td>Plant relocation and site rehabilitation</td>
<td>Physical inspection of translocated plants, physical inspection of areas that have been rehabilitated</td>
<td>Observation counts of mortality of the planted individuals, presence and density of alien invasive plant species, soil erosion and loss of topsoil</td>
</tr>
<tr>
<td>Vegetation and Soils</td>
<td>Servitude and maintenance roads</td>
<td>Physical inspection of areas that have been rehabilitated</td>
<td>Erosion channels and ditches</td>
</tr>
<tr>
<td>Wetlands</td>
<td>Servitude access</td>
<td>Physical inspection of wetlands along the servitude to identify any signs of physical disturbance of the wetland associated with servitude management</td>
<td>Evidence of disturbance of wetland soils and vegetation due to the movement of vehicles along the servitude, the presence of erosion of any roads within the wetland’s immediate catchment and any associated sedimentation in the wetland</td>
</tr>
<tr>
<td>Wetlands</td>
<td>In-wetland clearing of vegetation under the power lines where wetlands are spanned</td>
<td>Physical inspection of wetlands where vegetation clearing occurs</td>
<td>Evidence of disturbance of wetland soils in the strip where this is occurring, evidence of exposure of soils due to any associated die-back of vegetation</td>
</tr>
<tr>
<td>Avi-fauna</td>
<td>Faulting caused by birds</td>
<td>Incidences of faulting are to be reported to the Eskom Environmental Manager</td>
<td>Number and frequency of faulting incidences</td>
</tr>
<tr>
<td>Avi-fauna</td>
<td>Bird deaths due to collisions and electrocution</td>
<td>Incidences of bird collisions and electrocutions are to be reported to the Eskom Environmental Manager</td>
<td>Number and frequency of incidences, and numbers and species of birds involved</td>
</tr>
</tbody>
</table>

Table 2 Proposed Environmental Monitoring Schedule for the Operational Phase

7.7 Liaison with Interested and Affected Parties

Liaison with stakeholders, including local communities and their representatives, is to be undertaken by the project proponent as required and as appropriate. This must include liaison with landowners and land users, utility providers, neighbours, and relevant authorities. Complaints or queries received from stakeholders and actions taken to address complaints
must be addressed in writing. Copies of all interactions and correspondence shall be kept as part of record keeping.

7.8 **Registers**

The Employer must have registers for the following:

- Emergency procedures.
- Environmental incidents.
- Complaints and actions taken.

7.9 **Specialists’ recommendations**

In addition to the above-mentioned standard construction mitigation measures, the following specialists’ mitigation measures must be implemented:

7.9.1 **Impacts on terrestrial ecology and wetlands**

7.9.1.1 **Vegetation and wetlands**

- Monitor the increase of alien invasive plant species.
- Control alien plants using methodology in the EMPr.
- Burning programmes should take place after the first rains of the rainy season.
- Keep vegetation clearance to a minimum.
- All signs of erosion must be rehabilitated immediately.

7.9.1.2 **Avifauna**

- An Eskom approved bird friendly pole design must be used, taking into account that this is a vulture area and hence clearances must be adequate for vultures. The Distribution Technical Bulletin must be used in this regard. In addition, if a monopole structure is used, as this report has assumed, a Bird Perch must be installed on top of all poles, to provide safe perching substrate for birds well above the dangerous hardware. The above mitigation is extremely important as without it this impact will be of high significance.
- Install anti-bird collision line marking devices on the power line (earth wire) on certain sections of line identified as posing a high collision risk to birds. These sections of line will need to be identified by an avifaunal walk through as part of the site-specific EMPr.

7.9.2 **Visual and aesthetics aspects**

- Ensure that the design reflects the design of the existing power line as far as possible. This could include aligning existing and new towers.
- Ensure that all road crossings remain within valleys.
- Use solid monopoles where the alignment runs close to key areas. However, this needs to be considered against the differences in the existing and new towers (making the addition of the new line more obvious).
8. DECOMMISSIONING

Should decommissioning be required (in future years, decades or even longer) a site specific Decommissioning Plan will need to be compiled by Eskom and approved by the environmental authority at the appropriate time. Potentially, environmental authorisation and other licences and permits from relevant authorities will be required prior to the decommissioning process, depending on what is decommissioned, what waste is generated and what the conditions of the receiving environment and the adjacent land uses are at the time. The following will apply:

- It is assumed that the physical removal of the substation and power lines would entail the reversal of the construction process. The full extent of the decommissioning footprint must be determined.
- Best environmental practice available at the time of decommissioning should be applied and incorporated into the decommissioning plan.
- All required environmental authorisations and permits must be identified as part of the process of compiling the decommissioning plan, and must be in place prior to decommissioning.
- Access roads that are no longer required must be rehabilitated.
- A rehabilitation programme would need to be agreed upon with the landowner(s) before being implemented.
- The disposal of materials from the decommissioned substation and power lines (steel, cabling, concrete, rubble, glass, etc.) would be at an approved waste disposal facility. Alternatively, re-use and recycling opportunities could be investigated and implemented.
- Specific considerations regarding the servitude and landowner rights would need to be negotiated with the landowner(s) at the time of decommissioning.
- The decommissioning plan must identify residual impacts such as alien plant invasion and soil erosion and provide appropriate mitigation and monitoring measures.
9. APPENDICES

The following appendices apply:

- Appendix 1: Eskom's Erosion Guideline (TGL 41-337)
- Appendix 2: Eskom Technical Standards (TRMSCAAC1 Revision 3).
- Appendix 3: Eskom’s Standard for Vegetation Management Services on Eskom Networks.
- Appendix 4: Eskom’s Herbicide Management Policy (ESKPBAAD4)
- Appendix 5: Eskom’s Standard for the safe use of Pesticides and Herbicides (ESKASAAL0)
- Appendix 6: Eskom’s Fire Protection Association Guideline (TGL31-336)
- Appendix 7: Eskom’s Standard for Fire Risk Management (EST 32-124)
- Appendix 8: Eskom’s Access to Farms Standard (TPC 41-340)
- Appendix 9: Eskom’s Standard for Transmission Line Towers and Line Construction (TRMSCAAC1)
- Appendix 11: Eskom Transmission Bird Perch Guidelines (TGL41-332)
- Appendix 12: Eskom Transmission Bird Collision Prevention Guideline (TGL41-335)
- Appendix 13: Eskom’s Specifications for Bird Flight Diverters
- Appendix 14: Eskom Transmission Environmental Policy (TPL41-435)