



## **DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME**

### **LIMPOPO EAST CORRIDOR STRENGTHENING PROJECT**

**PROPOSED CONSTRUCTION OF ±110KM 400KV POWER LINE FROM FOSKOR MTS TO  
SPENCER MTS WITHIN MOPANI DISTRICT MUNICIPALITY, LIMPOPO PROVINCE,**

**DEA REF: 14/12/16/3/3//1076**

<b>Report Name:</b>	<b>Draft Environmental Management Programme for Limpopo East Corridor Strengthening Project</b>
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<b>Status:</b>	<b>Draft Report</b>
<p>This document presents the draft Environmental Management Programme for the Limpopo East Corridor Strengthening (Foskor-Spencer 400kV and Spencer MTS upgrade). The information and recommendations presented is based on the information supplied by the 'applicant', Eskom, specialists' studies, Interested and Affected Parties concerns and comments and observations made during the site visits conducted by the EAP for the duration of the assessment.</p>	



## DOCUMENT CONTROL

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**Report title:** Draft Environmental Management Programme for the Limpopo  
East Corridor Strengthening Project

**Prepared by:** DIGES Group

**Applicant:** Eskom Holdings SOC Ltd

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## EXECUTIVE SUMMARY

Eskom Holdings SOC Ltd (herein after referred to as Eskom) intends to construct 125,2km 400kV power line from the existing Foskor Main Transmission Substation (MTS) near Phalaborwa to the existing Spencer MTS near Giyani within Mopani District, Limpopo Province. In addition, Spencer MTS will be upgraded by adding a 400/132kV transformation yard and 1 x500MVA, 400/132kV transformer. The proposed activities to be undertaken (together with the infrastructure to be provided) are listed as having detrimental impacts on the environment and as such requires that an Environmental Impact Assessment be undertaken prior to the commencement of the project. Eskom has therefore appointed DIGES Group (herein after referred to as DIGES) to lodge an application with the Department of Environmental Affairs (DEA) for the proposed development in terms of Section 24 and 24D of the National Environmental Management Act (Act No.107 of 1998). The EIA has been undertaken to comply with the Environmental Impact Assessment Regulations (Government Notice R982) of December 2014 as amended on the 7<sup>th</sup> of April 2017 and an environmental authorisation for the following activities has been applied for:

### **Listing 1, Government Notice R983 (as amended)**

**Item 27:** The clearance of an area of 1 hectares or more, but less than 20hectares of indigenous vegetation.

**Item 30:** Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

### **Listing 2, Government Notice R984 (as amended)**

**Item 9:** The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity.

### **Listing 3, Government Notice R324**

**Item 12e(ii):** The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan in Limpopo within critical biodiversity areas identified in bioregional plans.

**Item 12e(iii):** On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.

Based on the information collected during the EIA in terms of impacts anticipated during the project cycle, a project specific Environmental Management Programme (EMPr) is to be developed. This Environmental Management Programme details the principles, practices and procedures to be implemented by the contractor and Eskom Holdings SOC Ltd to manage, remedy and mitigate potential adverse environmental effects anticipated during construction and operation of the power line. As such, the scope of this document is to give guidelines to the contractor and Eskom Holdings SOC Ltd regarding the effective management of the environment during the construction of the Foskop-Spencer 400kV Transmission power line and associated works at Spencer MTS.

**THE MANAGEMENT PROGRAMME HAS LONG-TERM OBJECTIVES TO ENSURE THAT:**

- ❑ Environmental Management considerations are implemented from the start of the project and throughout the operational life-time of the power line;
- ❑ Precautions against damage and claims arising from damage are taken well in advance;
- ❑ The completion date of the contract is not delayed due to problems with landowners arising during the course of construction; and
- ❑ Regulatory requirements as well as the Environmental Authorisation are adhered to.

This document (hereafter referred to as the EMPr) sets the institutional framework for responsibilities and reporting of all environmental issues during the construction of the 400kV Transmission power line. It is important that the contractors' team and engineers be fully acquainted with the contents of this EMPr, to ensure that the potential negative impacts are avoided or identified in advance during construction and the specified mitigation measures detailed in this report are implemented, therein instilling a more proactive and less reactive work ethic throughout the construction process.

Should these recommended measures and corrective actions be adopted during the construction, operation/ maintenance and decommissioning phases of the proposed activity, DIGES finds that the predicted impacts of the proposed activities are within acceptable limits. Once the route has been authorized and the tower locations and designs have been determined, this Draft EMPr should be revised to include tower specific mitigation measures. Of note is that environmental management is dynamic and as such, the Final EMPr must be flexible in order to accommodate changing circumstances and requirements. On-going environmental monitoring and maintenance of the 400kV power line and substations should be carried out throughout its life cycle, and Eskom and a

dedicated Environmental Practitioner should identify and address new issues as they arise, and update or amend the management plan accordingly.

## REPORT STRUCTURE

**Section 1** of this EMPr details the purpose and scope of the EMPr and outlines Eskom's environmental policy, and environmental objectives. The section also identifies the key legislative requirements applicable to the environmental aspects of the Project. It details the EMPr roles and responsibilities and the related training requirements for the construction phase of the Project

**Section 2** presents the project description and the social and environmental management context of the Project. It details the main construction activities and methodologies of the Project.

**Section 3** details the standard mitigation measures to be implemented on-site. Environmental management standards and specifications for managing the significant environmental aspects of the construction, operation and decommissioning phase are discussed.

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## ACRONYMS AND ABBREVIATIONS

BFDs	Bird Flight Diverters
BG	Bird Guards
CARA	Conservation of Agricultural Resources Act
EMPr	Construction Environmental Management Programme
CLO	Community Liaison Officer
CMS	Construction Method Statement
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
DME	Department of Minerals and Energy
EA	Environmental Authorization issued by DEA
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act
ECO	Environmental Compliance Officer
EIA	Environmental Impact Assessment
EO	Environmental Officer
GA	General Authorization
HA	Hectares
HSO	Health and Safety Officer
IEM	Integrated Environmental Management
kV	kilo Volts
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
ROW	Right Of Way
SAHRA	South African Heritage and Resources Agency
SANS	South African National Standards
SHEQ	Safety, Health, Environmental and Quality
WI	Work Instruction
WUL	Water Use License

## DEFINITIONS

Alien Vegetation	Alien vegetation is defined as undesirable plant growth, which 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 (CARA) regulations. Other vegetation deemed alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared undesirable.
Berm	A barrier designed to divert surface water flow. Berms will primarily be used along roads/tracks to prevent concentrated flow of water over particular areas, thereby reducing erosion of roads.
Bund	An impervious material, which forms the perimeter and floor of a compound and provides a barrier to retain liquid. Bunds are designed to contain spillages and leaks of liquids used, stored or processed above ground and to facilitate clean-up operations.
Batch Plant	Site for the mixing and production of concrete or plaster, and associated equipment and materials.
Construction Camp	is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), ablution facilities, waste and wastewater management.
Contractor	Construction companies as well as their sub-consultants and suppliers appointed to undertake the construction activities on behalf of Eskom Holdings SOC Ltd.
Corrective action	Action to eliminate the cause of a detected nonconformity.
Developer	Developer of the project, Eskom Holdings SOC Ltd.
Endemic	the natural distribution of an organism (plant or animal) restricted to the local environmental conditions within an area.
Environment	The aggregate of surrounding objects, conditions and influences that influence the life and habits of man or any other organism or collection of organisms.
Environment Authorization	A written statement from the Department of Environmental Affairs that records its approval of a planned undertaking to construct the 400kV power line from Foskor to Spencer 400kV power line and the conditions of such an approval.
Environmental Control Officer	An external environmental consultant appointed by Eskom Holdings SOC Ltd to periodically monitor the level of implementation of the EMPr and suitable environmental management practices on site during the construction phase of the project.
Environmental Impact	A positive or negative change to the environment that results from the construction, operation and decommissioning of the activity. The impact can be direct or indirect result of the activities.
Environmental Management Programme (EMPr)	A programme that seeks to achieve a required environmental end state and describes how activities, that could have a negative impact

	on the environment, will be managed and monitored and impacted areas rehabilitated.
Environmental Management System (EMS)	Part of an organisation's management system used to develop and implement its environmental policy and manage its environmental aspects.
Environmental Policy	Overall intentions and directions of an organisation related to its environmental performance as formally expressed by top management.
Erosion	The process by which material, such as rock or soil, is worn away or removed by wind or water.
Eskom Environmental Officer (EEO)	A staff member of Eskom Holdings SOC Ltd who is appointed to ensure the day to day implementation of the EMPr and suitable environmental management practices are implemented on site for the duration of the construction phase of the project.
General Waste	Domestic, commercial, non-hazardous waste and builders' rubble.
Hazardous Substance	Any substance that is of risk to health and safety, property or the environment. Hazardous substances have been classified under the SANS 10228-B The identification and Classification of Dangerous Goods and Substances'.
Heritage Site	A site that contains either archaeological artefacts, graves, buildings older than 60 years, meteorological or geological fossils, etc.
Landowner	The individual or company that owns the land through which the servitude crosses.
LIHRA	The Provincial statutory body responsible for heritage resource management in Limpopo Province.
Method Statement	They indicate how compliance with the Environmental Specification will be achieved. The Contractor shall submit a written Method Statement to the ECO for approval, covering those activities which are identified in this document and/ or by the ECO as being potentially harmful to the environment.
"No-go" Areas	Areas identified as being environmentally sensitive, delineated on plan, demarcated on the site with pegs or fencing and which are out of bounds to unauthorised persons. Authorisation must be obtained prior to entry.
Non-conformity	Non-fulfilment of a requirement. A "non-conformance" is interpreted to include legal non-compliance, deviations from policy, objectives and targets not met, accidents, ineffective procedures, and deviations from specified conditions and from other requirements of the environmental management system.
Preventive action	Action to eliminate the cause of a potential non-conformity
Pollution	The direct and indirect alteration of the physical, chemical or biological properties of a resource which results in it being less fit for any beneficial purpose for which it may reasonably be expected to be used.
Project Manager	Person representing Eskom Holdings SOC Ltd who is responsible for technical and contractual implementation of the works to be

	undertaken.
Risk	The probability of an event occurring multiplied by the consequences of that event.
SAHRA	South African Heritage Resource Agency - the statutory body responsible for heritage resource management.
Site	Areas that will be utilised by the contractor for the duration of the duration of the contract. This shall include the 400kV servitude, Spencer and Foskor substation, access roads to be used, construction lay-down areas, materials storage and delivery requirements, contractors' offices, operational demarcation.
Slope	Means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units.
Storm-water	Water resulting from natural precipitation and/or accumulation and includes rainwater.
Topsoil	The upper outermost layer of soil (300mm) which has the highest concentration of organic matter.
Water body	Means a body containing water and includes dams and wetlands, whether ephemeral or permanent.
Watercourse	Means any river, stream and natural drainage channel whether carrying water or not.
Works	The construction operations and all related and incidental works, such as site works, earthworks, installation of services, rehabilitation etc, carrying to completion of the development.
Working area	Means the land and any other place on, under, over, in or through which the Works are to be executed or carried out, and any other land or place made available by the Employer in connection with the Works. The Working Area shall include the site office, construction camp, stockpile and laydown areas, assembly areas, batching areas, the construction corridor, all access routes and any additional areas to which the Project Manager permits access.

## SECTION 1: INTRODUCTION AND BACKGROUND INFORMATION

### 1.1 INTRODUCTION

Eskom Holdings SOC Ltd (herein after referred to as Eskom) intends to construct 125.2km 400kV power line from the existing Foskor Main Transmission Substation (MTS) near Phalaborwa to the existing Spencer MTS near Giyani within Mopani District, Limpopo Province. In addition, Spencer MTS will be upgraded by adding a 400/132kV transformation yard and 1 x500MVA, 400/132kV transformer. The proposed activities to be undertaken (together with the infrastructure to be provided) are listed as having detrimental impacts on the environment and as such requires that an Environmental Impact Assessment be undertaken prior to the commencement of the project. Eskom has therefore appointed DIGES Group (herein after referred to as DIGES) to lodge an application with the Department of Environmental Affairs (DEA) for the proposed development in terms of Section 24 and 24D of the National Environmental Management Act (Act No.107 of 1998). The EIA has been undertaken to comply with the Environmental Impact Assessment Regulations (Government Notice R982) of December 2014 as amended on the 7<sup>th</sup> of April 2017.

This Environmental Management Programme (EMPr) is for the construction, operation and decommissioning phase of the 400 kV power line and the upgrade of Spencer MTS. It sets out the intended methods of effectively managing potential environmental impacts arising from the construction and operation of the 400kV power line and substation. The responsibility for implementation of the EMPr lies with the Contractor and shall be controlled by Eskom's Project Manager who shall work in conjunction with the Environmental Control Officer (ECO) to ensure it is implemented. In the event that the route has been authorised and tower locations have been determined, it is the Project Manager's responsibility to ensure that this document is revised and updated as necessary.

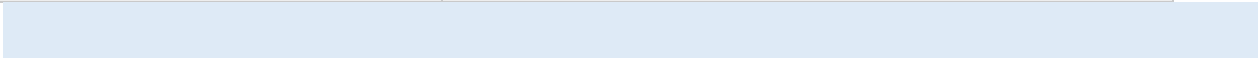
As per the requirements of the National Environmental Management Act: NEMA, 1998 (Act No. 107 of 1998), as amended and Government Notice R982, Environmental Impact Assessment Regulations of 2014 as amended, the details of the person(s) who prepared the Environmental Management Programme and the expertise of that person(s) to prepare an environmental management programme are provided below:

**Table 1-1: EAP Experience**

<b>Company</b>	<b>DIGES GROUP cc</b>
<b>EAP</b>	Brenda Makanza
<b>Postal Address</b>	P.O. Box 7068, Midrand 1685
<b>Telephone No.</b>	011 312 2878
<b>E-mail</b>	brendam@diges.co.za
<b>Expertise</b>	<p><u>Qualification(s)</u></p> <p>BSc (Hons) Environmental Science, Professional Diploma GIS.</p> <p><u>Professional Registration</u></p> <p>SACNASP: Professional Natural Scientist</p> <p><u>Experience</u></p> <p>A dedicated and passionate Environmentalist with valuable theoretical and experiential acumen in the areas of environmental conservation and administration. I have 12 years' experience gained through direct involvement in a number of conservation initiatives. Currently a Senior Environmental Consultant of DIGES Group responsible for leading, administrating and completing assessments on Environmental Impact Assessments, as well as overseeing studies, interpreting technical reports and appendices regarding the same.</p> <p>I leverage academic skills gained through an honours level degree in Environmental Science &amp; Health and Post Graduate Certificates in Integral Water Management and Geo-informatics; alongside the proficient ability to actively and valuably participate in the development, design and implementation of environmental / conservation management policies and consultation initiatives; thereby supporting the highest standards of Environmental</p>



	Management and Sustainable Development, in all undertakings. Reference is made to the CV attached in <b>Appendix A.</b>
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## 1.2 PURPOSE OF THE EMPR

In terms of the National Environmental Management Act (Act 107 of 1998, NEMA) as amended and its EIA Regulation, it is necessary to undertake environmental investigations as an integral part of project planning in order to obtain environmental authorisation for a proposed activity that may have a potentially negative effect on the environment. As such, an Environmental Impact Assessment (EIA) has been undertaken to identify and assess the aspects of construction, operation and decommissioning of the 400kV power line that could have an environmental impact. This EMPr identifies the project management structure, roles and responsibilities concerning managing and reporting on the environmental impacts of the construction, operation and decommissioning phase.

The purpose of this EMPr is therefore to describe the environmental management and monitoring procedures to be implemented during the Project's life span. The EMPr will enable the project team to construct the power line with the least adverse environmental effects. Overall implementation of this EMPr will ensure:

- ❑ Compliance with the conditions of resource consents and designations;
- ❑ Compliance with environmental legislation;
- ❑ Adherence to Eskom's environmental objectives; and
- ❑ Ensuring Environmental risks associated with the Project are properly managed.

This document will therefore define details of who, what, where and when environmental management and mitigation measures are to be implemented. It will also cover all anticipated construction, operation and decommissioning elements and present a framework of principles, environmental policy, objectives and performance standards as well as processes for implementing good environmental management.

## 1.3 ASSUMPTIONS

The EMPr is based on the assumptions described below.

- The main works to be carried out will be limited to activities typically defined as extension of the existing Spencer MTS and construction and operation of the 400kV Foskor –Spencer power line;
- The works will be carried out within a 55m servitude within the 3000m corridor assessed and will not involve relocation. Should cross rope suspension towers be used, a width of 75m is required at tower location;
- It is assumed that the Applicant has provided adequate details with regards to the activities to be carried out and the processes to be followed during the construction and operation phase;

- Information used to inform the assessment was limited to data and GIS coverage is available at a local, regional and national level at the time of the assessment. It is assumed that this data encompasses the site conditions;
- It is assumed that the specialists' reports are factual and give a correct indication of the environment and how the project activities will affect these resources.

## 1.4 EMPR LAYOUT AND STRUCTURE

All environmentally sensitive areas are indicated in Figure 2 in Section 2 and the relevant environmental management strategies to minimise negative impacts in these areas are dealt with in Section 3.

### 1.4.1 METHOD OF COMPILING EMPR (SPECIALIST ASSESSMENTS)

To identify specific areas along the proposed corridor the project team used specialists' reports, topographical maps and aerial photographs. Table 1-2 below indicates the team of specialists involved in the Environmental Impact Assessment and the compilation of this EMPr.

**Table 1-2: Specialist Input during CEMP**

Specialist	Company	Consultant
Avi-fauna	Chris Van Rooyen Consulting	Chris Van Rooyen
Archaeology	Vhubvo Archaeo- Heritage Consultants	Munyadziwa Magoma
Biodiversity	Bio-Assets	Dr Wynand Vlok
Eco-tourism	Engwe Scoping Consultants	Ms. Jennifer Mokakabye
Social Impact Assessment	Afro Conserva Intergration	Ms. Balungie Mabele
Soil and Land Capability	FNR Lesedi Organic Farming Development	Professor Kingsley Ayisi
Visual Impact Assessment	Zoneland Solutions	Jacques Louis Volschenk
Wetland Delineation	SAZI Environmental	Nonkanyiso Zungu

## 1.5 LEGISLATION AND OTHER REQUIREMENTS

This document has been compiled in accordance with the Integrated Environmental Management (IEM) philosophy (DEAT, 2004a) and Appendix 4 of the EIA Regulations R982 of 2014 as amended. This philosophy aims to achieve a desirable balance between conservation and development (DEAT, 1992). NEMA promotes the integrated environmental management of activities that may have a significant effect on the environment, while IEM prescribes a code of practice for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental and management tools that are appropriate for the various levels of decision-making. One such tool is an Environmental Management Programme.

### 1.5.1 ENVIRONMENTAL MANAGEMENT SYSTEM REQUIREMENTS

Eskom has a well-established Environmental Management System (EMS) that comprise of a number of activity specific policies and procedures. These serve as a guideline to assist during the project lifespan and should be implemented by all contractors. Of note is Eskom Transmissions Environmental Policy that describes Eskom transmissions commitment to environmental best practice. Their policy statement states that Eskom Transmission will:

- Continually improve environmental performance;
- Comply with applicable legislation and regulations as well as Eskom Holdings policies and guidelines as a minimum; and
- Prevent pollution of the environment.

### 1.5.2 NATIONAL AND PROVINCIAL LEGISLATION, REGULATIONS AND STRATEGIES

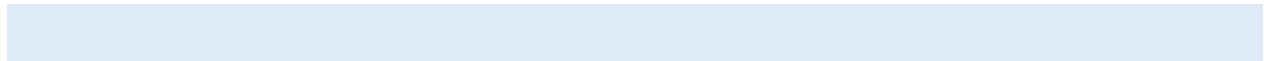
Construction and operation of the project must comply with a range of international, national, provincial and local legislation, regulations, strategies and policies in order to provide for the management of environmental effects. Key documents, national environmental legislation and regulations relevant to the Project are outlined in the table below:

**Table 1-3:** Relevant Legislation, Regulations and Standards

<b>TITLE OF LEGISLATION, POLICY OR GUIDELINE</b>	<b>APPLICABILITY TO THE PROJECT</b>
The South African Constitution Act (Act 108 of 1996)	<i>Human rights on the environment.</i>
National Environmental Management Act (Act 107 of 1998)	<i>Environmental Policy, in terms of environmental management.</i>
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	<i>It has regulations relating to listed threatened and protected species.</i>

<b>TITLE OF LEGISLATION, POLICY OR GUIDELINE</b>	<b>APPLICABILITY TO THE PROJECT</b>
Environment Conservation Act of 1989 (Act No. 73 of 1989)	<i>Provides for effective protection, control and utilization of the environment.</i>
National Water Act 1998 (Act 36 of 1998)	<i>Ensure that water resources are protected, used, developed, conserved, managed and controlled.</i>
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	<i>Supports conservation of soil, water and biodiversity.</i>
The National Heritage Resources Act (Act No. 25 of 1999)	<i>Protection of historical structures, graves and archaeological objects</i>
Atmospheric Pollution Prevention Act (Act No. 45 of 1965)	<i>Control of all forms of air pollution</i>
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	<i>Controls and manages air pollution (replaced the Atmospheric pollution prevention act)</i>
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	<i>Control of weeds and invader plants as well as the control of the utilization and protection of wetlands and soil conservation.</i>
National Road Traffic Act (Act No. 83 of 1996)	<i>Movement of dangerous goods.</i>
Animal Protection Act of 1962 (Act No. 71 of 1962)	<i>Relates to the prevention of cruelty to animals.</i>
Game Theft Act of 1991 (Act No. 105 of 1991)	<i>Regulates the ownership and protection of game.</i>
National Environmental Management: Waste Act (Act No. 59 of 2008)	<i>Control of storage, transfer, treatment and disposal of waste on land.</i>
Occupational Health and Safety Act (Act No. 85 of 1993)	<i>Exposure of workers and waste products.</i>
National Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	<i>Controls land use and infrastructure on mining and prospecting areas.</i>
Electricity Regulation Act (Act No. 4 of 2006)	<i>Governs the control of generation and supply of electricity and the functions of the National Energy Regulator.</i>
Fencing Act (Act No. 31 of 1963)	<i>Prohibition of damage to property of owners' gates and fences.</i>
Limpopo Provincial Heritage Regulations No. 103 of 2003	<i>Promotes an integrated system for the identification, assessment, and management of the heritage resources of Limpopo.</i>
Limpopo Environmental Management Act (Act No. 7 of 2003)	<i>Consolidate and amend the environmental management legislation of or assigned to Limpopo Province.</i>
National Forest Act (Act No. 84 of 1998)	<i>Control of veldt forest fires and protection of biota and ecosystems.</i>
SANS 10103	<i>The measurement and rating of environmental noise with respect to annoyance and to speech communication.</i>

<b>TITLE OF LEGISLATION, POLICY OR GUIDELINE</b>	<b>APPLICABILITY TO THE PROJECT</b>
White Paper on Energy Policy	<i>The supply of reliable electrical plan</i>
Energy Security Master Plan-Electricity: 2007-2025	<i>The supply of reliable electrical plan</i>
Integrated National Electricity Programme	<i>The supply of reliable electrical plan</i>
<i>Eskom Transmission Line Towers and Line construction</i>	
<i>Eskom: The safe management and use of pesticides and herbicides procedures</i>	
<i>Eskom: Oil spill clean-up and rehabilitation</i>	
<i>Eskom: Soil Erosion Guideline</i>	
<i>Eskom: Bird Collision guideline</i>	
<i>Eskom: Bird Nesting Guideline</i>	
<i>Eskom: Vegetation Management Guidelines</i>	
<i>Eskom: Procedure for vegetation clearance and the maintenance of over-head power line servitude and Eskom owned land</i>	
<i>Eskom: Transmission servitude gates</i>	



## 1.6 ADMINISTRATION MANAGEMENT

This EMPr should be used as a working document and it should be available on the construction site. The stipulations and provisions of this report should be conveyed to and familiarized by the contractor's senior personnel and workers responsible for construction. The mitigation section should be issued as a stand-alone document to all parties involved with the planning, implementation and operation of the proposed project. The contractor and all sub-contractors working on the project shall be required to sign acknowledgement and acceptance to the terms and conditions of this EMPr and any revised versions.

## 1.7 TRAINING AND AWARENESS

The Environmental Control Officer (ECO) in conjunction with the contractor shall be responsible for compiling and conducting the Environmental Awareness Training Programme. This programme will aim at explaining the impacts anticipated during the project cycle and mitigation measures described in this report. The Programme will also be used to improve awareness of all employees on a continuous basis. General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout the project's duration. This will ensure that environmental accidents are minimized and environmental compliance maximized. Based on this:

- The contractor shall arrange for the site induction on the Environmental Awareness issues before commencement of the project;
- The contractor shall ensure that adequate environmental awareness training of all the personnel working on the site familiarise with the contents of the environmental site control measures, which are outlined in this document.
- The contractor shall also make this training and awareness programme be conveyed to the personnel on site to the satisfaction of the Environmental Control Officer (ECO), either in written format or verbal, in the employees' language of choice.
- The contractor should keep environmental training sessions, including names, dates and the information presented records of all.

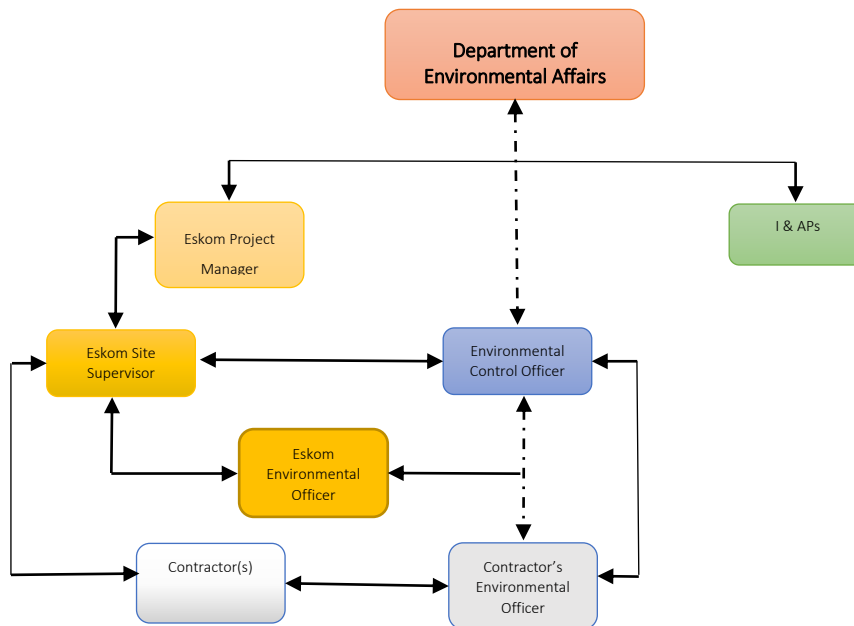
The environmental training should as a minimum, include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- The potential consequences of departure from specified operating procedures; and

- The mitigation measures required to be implemented when carrying out their work activities.

## 1.8 RESPONSIBILITIES

The proposed activities require the commitment of the people assigned responsibilities to undertake their duties to avoid negative impacts on the environment. Figure 1 indicates the reporting channels and highlights the relationships that need to be established between these role players to ensure that the EMPr is effectively implemented. The names and contact details of the relevant people as shown in Figure 1 should be made available prior to construction.



**Figure 1: Reporting channels**

### 1.8.1 ESKOM SOC HOLDINGS LIMITED

Eskom is ultimately responsible for compliance with all conditions of approval of the development or any aspect thereof by any authority. Eskom is to:

- Ensure that all relevant approvals and permits have been obtained prior to the start of construction activities on site. Permits that may be needed include the following:
  - i. Water Use Licenses;
  - ii. Tree cutting Permits,
  - iii. Archaeological objects removal and grave relocations; and



- iv. Approval of borrow pits from the Department of Mineral Resources.
- ❑ Ensure that the requirements as set out in this EMPr and the Environmental Authorisation issued by Department of Environmental Affairs and any other conditions of approvals by the relevant Authorities are adhered to and implemented by all involved in the project;
  - ❑ Appoint a suitably qualified or experienced independent Environmental Control Officer to undertake environmental compliance audits per the requirements of this EMPr;
  - ❑ Ensure that DEA is given written notice (within the timeframe specified) prior to the construction start including name and contact details of proposed ECO;
  - ❑ Provide all principal contractors working on the project with a copy of this EMPr as part of tender contract documentation to allow the contractors to cost for its requirements within their respective construction contracts.

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### 1.8.2 ESKOM SOC LTD: PROJECT MANAGER

This designation refers to the representative of Eskom who is responsible for the technical and contractual implementation of the works/part of the works to be undertaken.

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### 1.8.3 ESKOM SITE SUPERVISOR

The site supervisor shall report to the Project Manager and shall oversee site works, liaising with the ECO and the contractor(s). The site supervisor shall be responsible for the day-to-day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in this document.

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### 1.8.4 ESKOM ENVIRONMENTAL OFFICER

The Environmental Officer (EO) will report to the Project Manager and is responsible for the implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.

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### 1.8.5 THE CONTRACTOR

"The Contractor" refers to any directly/indirectly appointed company or individual undertaking the implementation of the works.

The Contractor is to:

- ❑ Ensure implementation of all applicable Environmental Management Specifications in this EMPr as well as all additional requirements related to approve method statements, during all works on

site, failing which penalties the Project Manager may impose. The contractor should submit the following method statements:

- I. Site camp establishment*
- II. Vegetation clearing*
- III. Clearing of alien vegetation*
- IV. Working in wetlands*
- V. Erosion and Storm-water control*
- VI. Fuel storage and use
- VII. Traffic accommodation
- VIII. Waste management*
- IX. Hazardous substances*
- X. Cement and concrete batching*
- XI. Emergency procedures*
- XII. Dust Control*
- XIII. Site Disestablishment and Rehabilitation.*

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#### *1.8.5.1 CONTRACTOR'S ENVIRONMENTAL OFFICER*

Each Contractor should appoint an Environmental Officer (EO), who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site contractors, labourers, the Environmental Control Officer and the public. The EO shall ensure that all Sub-contractors working under the Contractor abide by the requirements of the EMPr.

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#### *1.8.6 ENVIRONMENTAL CONTROL OFFICER*

The Environmental Control Officer (ECO) will be appointed by Eskom Holdings SOC Limited to ensure the day-to-day implementation of the EMPr and suitable environmental management practices on site for the duration of the construction phase of the project. The ECO's duties, inter alia, must be to facilitate compliance with the EMPr on an ongoing basis during the construction phase through monitoring, proactive, and open communication channels with the project/site management.

The ECO's responsibilities include the following:

- Monitoring and verifying that the EMPr and Environmental Authorisation issued by DEA is adhered to by inspecting the site and surrounding areas regularly during the construction start-up period and during environmentally sensitive work, periods of active construction with regard

to compliance with the EMPr and notifying the Project Manager if the specifications are not followed;

- ❑ Assist the contractor with the Environmental Awareness Training;
- ❑ Manage and implement Non-conformance procedures (NCR's, Defect notifications, punch lists) and site instructions;
- ❑ Give site instruction as to environmental issues;
- ❑ Monitor the contractor's implementation of project specific environmental requirements;
- ❑ Conduct Environmental surveillance inspections and internal audits. Conducting a site inspection and auditing compliance of the EMPr;
- ❑ Reviewing and approving construction method statements together with the Project Manager;
- ❑ Assisting the Project Manager in finding environmentally responsible solutions to problems; and
- ❑ Give final release form to affected landowners to be managed.

## 1.9 IMPLEMENTATION

During construction, the ECO will undertake ongoing inspections of the works to identify non-compliance with the provisions of the EMPr. The following parameters shall be utilised:

### 1.9.1 CONSTRUCTION METHOD STATEMENTS (CMS)

The EMPr provides the overall project strategy for management of environmental issues; however, a Construction Method Statement (CMS) will address environmental management issues at a site level. The contractor will be required to provide Method Statements prior to work commencing on aspects of the project deemed or identified to be of greater risk to the environment and/or which may not be covered in sufficient detail in the EMPr, when called upon to do so by the Project Manager and or ECO. Changes in the way the works are to be carried out must be reflected by amendments to the original approved Method Statement. Amendments require the signature of the Projects Manager and ECO indicating that the changes in methodology or works are necessary for the successful completion of the works and are environmentally acceptable. The contractor will also be required to sign the amended Method Statement thereby committing him/herself to the amended Method Statement. The CMS required for the development are listed in Section 1.8.5.

### 1.9.2 WORK INSTRUCTIONS (WIS)

The Environmental Control Officer shall advise the site/project manager on issuing of detailed Environmental Work Instructions (WIs) in the form of environmental controls that provide "hands on"

directions for on-site staff. These WIs should provide clear and concise instruction to site personnel in dealing with situations such as:

- environmental incidents;
- adverse weather conditions;
- complaints;
- controls and commitments detailed in the EMPr and CMS's;
- a trigger point contained in the environmental inspection checklist or log; and
- General good site practice.

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### 1.9.3 CHECKING AND CORRECTIVE ACTION

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#### 1.9.3.1 MONITORING AND REPORTING

The ECO & Eskom should develop monitoring and reporting procedures at the outset in order to:

- identify any negative impacts from construction activities;
- assess the effectiveness of control measures;
- demonstrate compliance with regulatory conditions and objectives and targets set in the EMPr; and
- Identify if further controls/corrective action is required.

In addition, monitoring may be required because of a complaint, a request by a statutory body or a trigger point in an inspection or checklist being exceeded. Monitoring and reporting should also reflect any requirements identified or commitments made in the Construction Method Statement.

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### 1.9.4 ENVIRONMENTAL INSPECTIONS, AUDITS AND REGISTERS

In addition to the routine monitoring conducted by the ECO, a schedule of regular inspections, audits and reporting will be required by the contractor. These inspections should provide a record of site conditions and activities and provide a mechanism by which the contractor, ECO and Eskom can establish the effectiveness of this EMPr.

These checklists and reports are to be kept at the site office and should be updated and used in the day-to-day operation of the site. Eskom should also develop a schedule of inspections and auditing of the EMPr in order to ensure that the contractor is maintaining established standards of environmental controls.

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### 1.9.5 COMPLIANCE AND NON-CONFORMANCE

If criteria within this EMPr are not fulfilled and the contractor does not take, appropriate and corrective action a non-conformance may be raised by the ECO. It is the responsibility of the contractor to immediately initiate corrective actions and, once completed, provide details of the actions undertaken on the non-conformance/corrective action report and return it signed to the Eskom's project manager within 30 days.

## 1.10 DOCUMENTATION

The Contractor for the development will establish a dedicated file to contain all documentation pertaining to environmental management of the works. The records below will form an integral part of the contractor's records:

- ✓ Environmental incidents involving Contractor employees and/or the public;
- ✓ Environmental complaints and correspondence received from the public to the Project Manager or the Environmental Control Officer;
- ✓ Record and report incidents that cause harm or may cause harm to the environment to the Environmental Control Officer;
- ✓ Record of all hazardous materials used on site;
- ✓ A record of all Hazardous Waste Disposal Manifests detailing the nature of the hazardous waste disposed of, the hazardous waste classification and the location of the site to which such waste was disposed.

In addition, the following documentation must also be kept on site in order to record compliance with the EMPr:

- ❑ Copies of the Environmental Authorisation;
- ❑ Records of acknowledgement and acceptance of the EMPr by the Department of Environmental Affairs;
- ❑ Copy of the full Environmental Impact Assessment Documents;
- ❑ The full copy of the approved Construction Environmental Management Programme;
- ❑ All signed copies of the contractor(s) Environmental Agreement;
- ❑ Daily Site Diary;

- ❑ Daily Report;
- ❑ Image library of activities on site;
- ❑ Public Complaints register;
- ❑ Environmental incidents register;
- ❑ Non-conformance Reports;
- ❑ Method Statements;
- ❑ Material Safety Data Sheets (MSDS);
- ❑ Written Corrective Action Instructions;
- ❑ Safe disposal certificate for all types of waste disposed of;
- ❑ Environmental Training Records; and
- ❑ Notification of Emergencies and Incidents.

In addition, copies of the following legislation should also be available on site:

- i. National Environmental Management Act (Act No. 107 of 1998);
- ii. National Water Act (Act No. 36 of 1998);
- iii. National Environmental Management: Air Quality Act (Act No. 39 of 2004);
- iv. National Heritage Resources Act (Act No. 25 of 1999);
- v. Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA) ; and
- vi. National Forests Act (Act No. 84 of 1998).

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#### 1.10.1 ENVIRONMENTAL INCIDENTS REGISTER

The ECO should put in place an Environmental Register and must ensure that the following information is recorded for all environmental incidents:

- ❑ Nature of incident;
- ❑ Causes of incident;
- ❑ Party/parties responsible for causing incident;
- ❑ Immediate actions undertaken to stop/reduce/contain the causes of the incident;

- ❑ Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the incident; and
- ❑ Timeframes and the parties responsible for the implementation of the corrective or remedial actions; and Copies of all correspondence received regarding incidents.

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#### 1.10.2 PUBLIC COMPLAINTS REGISTER

The ECO shall further maintain the Public complaints register that will:

- ❑ Contain environmental complaints and correspondence received from the public to the Contractor or the ECO.
- ❑ Nature of complaint and where possible an image of the issue;
- ❑ Cause of complaint;
- ❑ Party/parties in responsible for complaint;
- ❑ Immediate actions undertaken to stop/reduce/contain the causes of the complaint including an image of the resolved action; and
- ❑ Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint.

## SECTION 2: PROJECT DESCRIPTION

### 2.1 NEED AND DESIRABILITY

Mining operations, residential, agricultural and industrial activities in some parts of Limpopo Province are supplied by the Polokwane Customer Load Network (PCLN), which is comprised of 4 substations with Spencer 275/132kV substation being one of them. Spencer substation is located approximately 37km south-west of Giyani and is currently fed by 275kV power lines from Tabor and Witkop substations located approximately 86km and 136km respectively. In addition, the substation is equipped with 2x250MVA, 275/132kV transformers. There are 132kV power lines which link into distribution substations within the area and that interconnect Spencer and Foskor MTS with the distribution substations. The load profile undertaken for the Province showed that Spencer substation would be having a peak demand of 318MVA by 2018. Eskom Transmission Grid Planning therefore initiated a study to investigate possible alternatives and solutions to address the transformation constraints at Spencer MTS, as well as 275kV transmission network constraints on the network supplying Spencer MTS supply zone. The activities identified to address these constraints entailed the following:

- i. Construct a 400kV power line from Foskor Substation to Spencer Substation with a length of 125,2km; and
- ii. Establish 400/132kV transformation yard and install 1 x 500MVA, 400/132kV transformer at Spencer Substation.

### 2.2 PROJECT ACTIVITIES

The proposed project addressed in this document, involves the construction and operation of the following infrastructure:

- 125,2km, 400kV power line from Foskor MTS near Phalaborwa to Spencer MTS near Mohlabaneng village. Though a 400kV power line requires a 55m wide servitude, this study has assessed a 3000m wide corridor to cater for constraints, which might be posed by the location of physical features and the final engineering designs. The technical specifications of the power line are given in the table below:



**Table 2-1: Technical Specification of the Power line**

Component	Description/dimensions
<b>Power line capacity</b>	400kV
<b>Pylon type</b>	Cross rope suspension Guyed suspension tower Self-supporting tower
<b>Height of power lines</b>	30-45m
<b>Length of servitude</b>	125,2m
<b>Width of servitude</b>	55m (75m at tower location for cross rope suspension)
<b>Minimum ground clearance</b>	8.1m

- ❑ 400/132kV transformation yard and 1 x 500MVA, 400/132kV transformer which will cater for the proposed 400kV power line coming from Foskor MTS. This extension will require a footprint area of ±9 ha;
- ❑ A transformer oil-holding dam with a capacity of 120m<sup>3</sup>. The oil dam is required to contain any spillage from the 1 x500MVA, 400/132kV transformer and to prevent pollution to the environment thereby ensuring compliance with Environmental Legislation.

The proposed activities are listed in Listing Notice 1, 2 and 3 as having a detrimental impact to the environment hence require an Environmental Impact Assessment to be undertaken. The proposed activities to be undertaken (together with the infrastructure to be provided) are listed as Item 27 and 30 of Listing Notice 1 (Government Notice R983), Item 9 of Listing Notice 2 (Government Notice R984) and Item 12(e) (ii), (iii) of Listing Notice 3 (Government Notice R324) as amended which reads as follows:

**Listing 1, Government Notice R983 (as amended)**

**Item 27:** The clearance of an area of 1 hectares or more, but less than 20hectares of indigenous vegetation.

*Applicability*

The extension of Spencer substation requires ±9 hectares of which more than 1 hectare of indigenous vegetation will be cleared during the construction phase.

**30 of R983 (as amended):** Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

Applicability

Based on activity 12(e ) (ii) and (iii), vegetation will be cleared in Critical Biodiversity Areas.

**Listing 2, Government Notice R984 (as amended)**

**Item 9:** The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity.

Applicability

In order to fulfill its mandate and ensure the supply of adequate electricity, Eskom intends to construct ±110km, 400kV power line from Foskor MTS to Spencer MTS traversing across areas that are largely classified as rural.

**Listing 3, Government Notice R324**

**Item 12e(ii):** The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan in Limpopo within critical biodiversity areas identified in bioregional plans.

Applicability

According to the Draft Mopani Bioregional Plan and the Limpopo Conservation Plan v2, the proposed power line alternatives traverses across areas that have been classified as critical biodiversity areas, CBA1, CBA2, ESA1 and ESA2. More than 300m<sup>2</sup> indigenous vegetation will be cleared at tower positions and during access road construction.

**Item 12e(iii):** On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.

Applicability

300m<sup>2</sup> of indigenous vegetation will be cleared in conservation areas (nature reserves) surrounding Foskor substation.

## 2.3 LOCATION

### 2.3.1 REGIONAL CONTEXT OF THE PROJECT

The proposed project is within Mopani District Municipality located in the north-eastern part of the Limpopo Province and bordered by Ehlanzeni District Municipality in the south, Greater Sekhukhune District Municipality in the south-west, Capricon District in the west and Vhembe District in the north-west. The proposed power line alternatives will traverse across 4 local municipalities within the District Municipality namely Maruleng, Greater Tzaneen, Greater Letaba and Ba-Phalaborwa which are approximately 90km, 44km, 65km and 115km west of Polokwane respectively. The District can be accessed via R71, R81, R40, R526 and various district roads.

Reference is made to the map overleaf that shows location of the recommended route.

### 2.3.2 PROJECT FOOTPRINT

The land-use within the project area is largely comprised of nature reserves, residential, mining, commercial and subsistence farming. The farms are in private ownership and communal land owned by the Government and under the control of Traditional Authorities. Foskor Main Transmission Substation is located on farm Loole 31LU at the following co-ordinates: **24°1'40.05"S, 31°07'37.41"E** within Foskor Mine which is approximately 9km south of Phalaborwa and 12km west of Kruger National Park. Foskor substation can be accessed via R40 and R71. Spencer substation is located 37km south-west of Giyani, on farm Worcester 200LT at the following co-ordinates: **23°29'19.37"S, 30°22'51.58"E** and is near Mohlabaneng. The substation can be accessed via R81 road to Giyani.

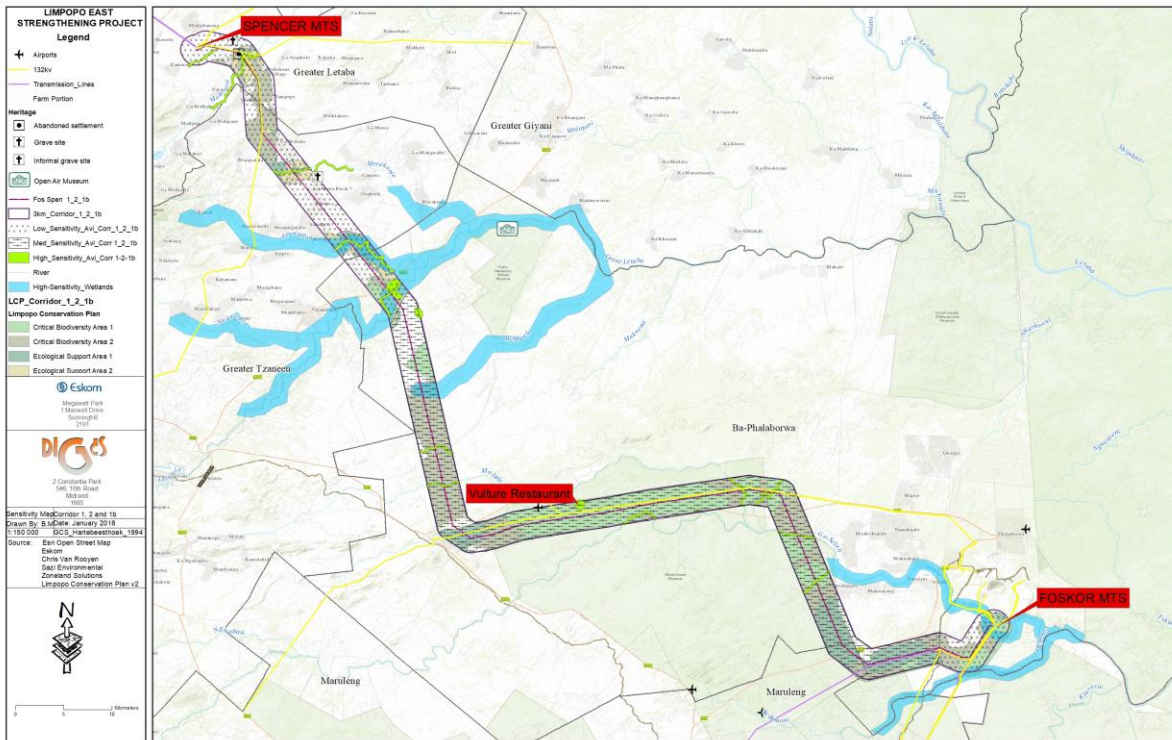


Figure 2: Sensitivity Map

## 2.4 CONSTRUCTION PROCESS

The construction phase of the project is expected to take up to 24 months with a project lifespan of 40 years or more. The main works for the construction of the 400kV power lines and substation include the following:

### 2.4.1 PRE-CONSTRUCTION

#### □ *Right of Way Surveying*

Prior to construction of the overhead line a precise ground survey is carried out to determine the ground profile along the centre of the line route and for 27.5m on either side where the ground profile slopes across the line route. This is to ensure that the location selected for poles and stays and their relationship with each other comply with the technical limits laid down for maximum span lengths, maximum sums of adjacent spans and safe clearance to live conductors in the final siting of pole. Further consideration is given to detailed environmental effects.

Where the route of the line passes over or in close proximity to trees that could infringe safe clearances to 'live' conductors, the trees must be felled or pruned prior to the construction of the line.

- *Soil sampling*

Geotechnical investigations will be carried out at tower positions to determine the type of foundation. The holes will be filled in after soil sampling is completed.

- *Structure Stacking*

A survey crew will peg the substation location and the power line corridor.

- *Clearing*

The Right Of Way must be cleared to allow for construction and operation activities of substation and power line. The land-owner and the local community will be notified prior to construction clearing.

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#### 2.4.2 CONSTRUCTION PHASE

Overhead power line construction follows a standard sequence of activities mentioned below:

- *Construction Camp*

The Right Of Way corridor may be used as an area for temporary storage and handling for equipment and materials related to construction. Steel components of structures may be delivered and placed on the ground near foundation sites.

- *Foundation Installation*

A work crew will excavate the foundations for the towers. The foundation is influenced by the terrain encountered as well as the underlying geotechnical condition. The actual size and type of foundation to be installed will depend on the soil bearing capacity and can be excavated manually or by using machines. The foundations will be back filled, stabilized through compaction and capped with concrete.

- *Erecting structures and stringing Conductors*

Once foundations are in place, the following work will be carried out:

- i. Erection of the structures within the Right Of Way;
- ii. The steel components of the tower will be assembled using a crane and then lifted onto the foundations;
- iii. Insulators and attachment hardware will be installed and stringing sheaves attached to the insulators; and

- iv. The conductors will be strung by attaching the conductor to a steel line and pulled through each structure's stringing sheaves under tension to keep the conductors well off the ground.

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#### 2.4.3 SUBSTATION CONSTRUCTION

To cater for the proposed 400kV power line, Spencer substation needs to be extended/ upgraded to establish the 400/132kV transformation yard and the 1x500MVA, 400/132kV transformer. In addition, a transformer oil holding dam with a capacity of 120m<sup>3</sup> will also be constructed. The area required for this extension is approximately ±9 hectares. The proposed upgrade/ extension works will entail the following activities:

- Cut and fill grading;
- Placement and compaction of structure fill to serve as a foundation for equipment;
- Grading to maintain drainage patterns;
- Installation of equipment and structure foundations;
- Construction of bund walls, oil drainage pipes and oil holding dam;
- Construction of formal drainage and storm-water control measures;
- Installation of structures and equipment;
- Connection of the new infrastructure to the existing network; and
- Erect a fence around the perimeter of the substation.

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#### 2.4.4 OPERATION AND MAINTENANCE

During the operation phase, ESKOM shall perform the following activities;

- i. Vegetation maintenance within the ROW and access roads. This will ensure that vegetation does not interfere with human safety, transmission line conductors, towers and impede access to the transmission line for maintenance crews. Vegetation clearance shall be performed using a variety of methods such as manual, mechanical and herbicidal applications;
- ii. Access road maintenance to ensure that the roads are in good condition for all weather access by maintenance crews; and
- iii. Transmission line maintenance which will include routine checks and system upgrade and repairs.

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#### 2.4.5 DECOMMISSIONING

During the decommissioning phase, the removal of the line will be the reversal of the construction phase and rehabilitation of the ROW. The process of dismantling and removal of the line includes:

- Lowering the overhead conductors and earth wires to the ground and removing them from the site and selling them as scrap;
- Removing insulators and line hardware from structures at the site and disposing them at a registered local authority waste facility;
- Dismantling the towers and cutting them into pieces small enough to be handled and transported from the site;
- Demolition of foundations and disposing the concrete at a registered landfill site; and
- Backfilling and compaction of the excavation with suitable material.

## SECTION 3: ACTIVITIES AND STANDARD MITIGATION

The standard mitigations contained in Sections 3.2.1 to 3.2.6 are for the core standard mitigation measures/statements for the pre-construction, construction, operation and decommissioning phase of this project (power line and substation). Following extensive environmental impact assessment of the study area and stakeholder consultations. These statements also contain the requirements as stipulated in the following documentation:

- a) Eskom Standard documentation for line construction and Management; and
- b) Mitigation measures recommended by specialists after the assessment.

### 3.1 ENVIRONMENTAL MITIGATION STATEMENTS

Eskom and the contractors are required to ensure that all the mitigation methods contained in the statements listed below are implemented at all times.

**Table 3-1:** List of Standard Management Measures

<b>PRE-CONSTRUCTION</b>		
PRE-001	Land Negotiations	
PRE-002	Design Of Power Line And Substation	
PRE-003	Tendering and Employment	
<b>CONSTRUCTION AND REHABILITATION</b>		
<b>Contractor Technical requirements and their control</b>		
CON-001	Site establishment	
CON-002	Workshop and equipment storage areas	
CON-003	Servicing of Vehicles	
CON-004	Storage areas and handling of hazardous substances	
CON-005	No-go areas	
<b>Physical issues and their control</b>		
PHY-001	Terrain	
PHY-002	Wet Area	
PHY-003	River Crossings	
PHY-004	Storm-water and Erosion Management	



PHY-005	Access roads	
PHY-006	Waste disposal	
PHY-007	Vegetation clearing	
PHY-008	Alien Invasive Species	
PHY-009	Open Space Management Plan	
PHY-010	Gate installation and gate control	
PHY-011	Fire prevention	
PHY-012	Tower Positions	
PHY-013	Batching plant	
PHY-014	Stringing operations and bird flappers	
PHY-015	Site Disestablishment	
<b>Social issues and their control</b>		
SOC-001	Sanitation	
SOC-002	Health and Safety	
SOC-003	Noise Control	
SOC-004	Landowner's/Stakeholder Concerns	
SOC-005	Air Quality	
SOC-006	Traffic Management Plan	
SOC-007	Tourism and Nature Reserves	
<b>Biological issues and their control</b>		
BIO-001	Fauna and Flora	
BIO-002	Herbicide Use	
BIO-003	Re-vegetation and Rehabilitation	
<b>Cultural issues and their control</b>		
CUL-001	Archaeological and Heritage Sites	
CUL-002	Infrastructure	
<b>Operation</b>		
OPER-001	Operations	

## 3.2 STRUCTURE OF MANAGEMENT MEASURES

The specifications are set out as follows:

1. Legislated Requirements

Some of the relevant legislation, but not necessarily a comprehensive list, that applies to each management section.

2. Background

Background to site conditions and/or the environmental impact being mitigated.

3. Objectives

What the management specifications are trying to achieve?

4. Performance Indicators

Identifies indicators that demonstrate the level of compliance with a procedure.

5. Procedures

The actual management specifications that aim to avoid or mitigate potential environmental impacts.

6. Monitoring and Reporting

Describes the frequency and type of monitoring of each management section and how and in what forum this is reported on.

7. Related Documents

Describes related documents containing existing guidelines or requirements related to the environment.

## 3.2.1 PRE-CONSTRUCTION

PRE-001	LAND NEGOTIATION
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Constitution of the Republic of South Africa;</li> <li>▪ Promotion of Access to Information Act (Act No. 2 of 2000);</li> <li>▪ Promotion of Administrative Justice Act (Act No.3 Of 2000);</li> <li>▪ Subdivision of agricultural Land Act, No. 70 of 1970 as amended.</li> </ul>	
<p><b><u>Background</u></b></p> <p>400kV power lines are constructed and operated within a 55m wide/75m in case of cross rope towers that is established along the entire length of the line. Within this servitude, Eskom Transmission have certain rights and controls that support the safe and effective operation of the line. Eskom is responsible for the servitude negotiation process which is undertaken after a route has been environmentally authorized by DEA and this process must be completed with the relevant landowner before construction starts on that property.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To ensure adequate regard has been taken of concerns of affected and surrounding landowners and that these are appropriately addressed;</li> <li>▪ To minimise complaints from landowners; and</li> <li>▪ To prevent litigation due to outstanding claims.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ Signed landowners agreement forms;</li> <li>▪ Landowners' adequately compensated; and</li> <li>▪ All complaints and issues received are timeously attended to and addressed.</li> </ul>	
<p><b><u>Procedures</u></b></p> <ul style="list-style-type: none"> <li>▪ Where required, relocation and decommissioning of dwellings may only take place once negotiations and compensations have been finalised by Eskom;</li> <li>▪ The success of the project depends a lot on the good relations with the landowners. It is therefore required that the Liaison Officer (LLO) be the only liaison between the contractor and landowners;</li> <li>▪ All negotiations for any reason shall be between Eskom, the landowner and the ECO. NO verbal agreements shall be made. All agreements shall be recorded properly and all parties shall co-sign the documentation. It is proposed that the Contractor and ECO keep a photographic record of access roads before the commencement of construction activities. This will then be available should any claims be instituted by any landowners. Any claims instituted by the landowners shall be investigated and treated promptly. Unnecessary delays should be avoided at all costs;</li> <li>▪ The landowners shall always be kept informed about any changes to the construction programme should they be involved. The contact numbers of the Eskom ECO shall be made available to the landowners. This will ensure open channels of communication and prompt response to queries and claims; and</li> <li>▪ All contact with the landowners shall be courteous at all times. The rights of the landowners shall be respected at all times and all staff shall be sensitised to the effect that they are working on</li> </ul>	

<p>private property. Eskom Project Manager and Liaison Officer must establish formal contact with the landowners. Such landowners must be provided with the contact numbers of relevant project and site management staff, with whom any complaint, concern or issue can be lodged for immediate attention.</p> <ul style="list-style-type: none"> <li>▪ All landowners to sign access agreements with Eskom. ECO and Contractor to be present to ascertain special conditions;</li> <li>▪ Eskom personnel and the contractor(s) team should not access private properties without prior notification of the property owners;</li> <li>▪ Eskom should coordinate with landowners in terms of access and construction activities in order to minimise disturbance; and</li> <li>▪ A register shall be kept of all complaints from landowners. All claims shall be handled immediately to ensure timely rectification / payment.</li> </ul>
<p><b>Monitoring</b></p> <p><b>Responsible Party:</b> Eskom Land Rights Representative; Negotiators and land owners</p> <p><b>Frequency:</b> Prior to Commencement of Construction Activities</p>
<p><b>Related Section</b></p> <ul style="list-style-type: none"> <li>▪ SOC-003</li> </ul>

<b>PRE-002</b>	<b>DESIGN OF POWER LINE AND SUBSTATION</b>
<p><b>Legislation</b></p> <ul style="list-style-type: none"> <li>▪ Constitution of the Republic of South Africa;</li> <li>▪ Infrastructure Development Act (Act 23 of 2014)</li> </ul>	
<p><b>Background</b></p> <p>After an Environmental Authorisation, Eskom engineers will commence with the design of the power line and substation and structures will be based on the environment within the servitude.</p>	
<p><b>Management Objectives</b></p> <ul style="list-style-type: none"> <li>▪ ESKOM must arrange for any access to the site that will be required with the landowners.</li> <li>▪ The site should be left in the same conditions as previously found in;</li> <li>▪ Minimal visual intrusion by construction activities and general acceptance and compliance with Environmental Specifications;</li> <li>▪ Construction site is confined to the demarcated areas identified on a Development Plan; and</li> <li>▪ Identification of the power line servitude, tower types and positions results in a minimal impact of the current social and biophysical environment.</li> </ul>	
<p><b>Target</b></p> <ul style="list-style-type: none"> <li>▪ Approved line and tower designs,</li> <li>▪ Approved EMPr;</li> <li>▪ Minimal impact identified;</li> </ul>	

- Appointed ECO; and
- No complaints from landowners and surrounding communities.

### **Procedures**

- *General*
- Walk down assessment for biodiversity, avi-fauna and heritage should be undertaken to assist with the final routing of the power line. No-go areas identified during the walk-down should be avoided as far as possible and mitigation measures should be implemented;
- High risk sections of power line must be identified by a qualified avifaunal specialist during the walk-through phase of the project, once the alignment has been finalized.
- When locating the towers, watercourses should be avoided and ensure that the necessary licences/authorisations are issued prior to construction. Locate all tower at a safe distance of 32m from water sources so that excavation work does not cause large quantities of soil to be washed in streams;
- Construction and maintenance tracks and roads should also be located outside of buffered watercourses;
- The footprint area of towers must be limited to what is essential in order to minimise impacts as a result of vegetation clearing and compaction of soils;
- The powerlines should be constructed on farm boundaries and existing roads and power lines as far as possible, especially in conservation areas;
- To prevent erosion and sedimentation of the water resources, tower design should take into account adequate storm-water management;
- An Environmental Control Officer (ECO) must be appointed to oversee the construction process and ensure compliance with conditions of approval; and
- Plan construction times in such a manner to have the least impact on surrounding properties.
- *Visual and Tourism*
- Construction sites must be kept tidy and litter free to reduce the potential visual impact.
- Concentrate powerline in or near existing corridors to prevent proliferation of the natural landscape;
- No clearing of land to take place outside the demarcated footprints;
- The contractor should maintain good housekeeping on site to avoid litter and minimise waste.
- Where new access roads are required, disturbance should be minimized by keeping roads narrow and using two-track dirt roads wherever possible. Road verges must be avoided at all times.
- It must also be noted that, smaller towers or those with a more compact design (e.g. cross-rope suspension towers) should be used.
- By keeping the proposed lines as straight as possible, fewer strain towers will be required. This is preferable as strain towers are visually obtrusive compared to the suspension towers used when alignments are straight. The galvanising of the pylon should be allowed to weather a matt grey finish rather than be painted silver, as is often the case. This allows the structures to blend in with the existing environmental colours more readily than the silver that is highly reflective especially

<p>early morning and late afternoon. Should it be necessary to paint, it is recommended that a neutral matt finish be used;</p> <ul style="list-style-type: none"> <li>▪ Avoid placing the transmission line in close view of restaurants and accommodation facilities where the visual beauty of the area is the main attraction;</li> <li>▪ Avoid placing the transmission line across properties used for eco-tourism and leisure. Should avoidance not be possible, the alignment should avoid the main activity areas and preferably be placed on the border of the properties;</li> <li>▪ Avoid placing the transmission line across nature reserves at all costs. Thus, placement of a new transmission line away from numerous tourism establishments, could limit the negative impacts on the tourism industry rather than placing the new proposed transmission line in close proximity to these tourism establishments. This could be considered as an option in the central section of the study area.</li> </ul>
<p><b><u>Monitoring Responsibility and Frequency</u></b></p> <ul style="list-style-type: none"> <li>▪ Monitoring to be undertaken by an appointed Site Engineer who will enforce compliance with the Environmental Specifications;</li> <li>▪ The EAP to submit a CEMPr with specialist walk-down reports to DEA and Eskom prior to construction.</li> </ul>

<b>PRE-003</b>	<b>TENDERING AND EMPLOYMENT</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Occupational Health and Safety Act (Act No. 85 of 1993);</li> <li>▪ National Building Regulations and Standards Act No. 103 of 1997;</li> <li>▪ Constitution of South Africa;</li> <li>▪ National Heritage Resources Act, 1999 (Act No. 25 of 1999);</li> <li>▪ National Water Act (Act 36 of 1998 as amended);</li> <li>▪ National Environmental Management: Air Quality Act (Act 39 of 2004);</li> <li>▪ Promotion of Access to Information Act (Act No. 2 of 2000);</li> <li>▪ Promotion of Administrative Justice Act (Act No.3 Of 2000).</li> </ul>	
<p><b><u>Background</u></b></p> <p>Once the design and the Construction and Operation Environmental Management Plan has been approved, the proposed project will be advertised for tendering and in these documents all requirements will be included in the documentation.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To improve the socio-economic status of the surrounding communities;</li> <li>▪ To create employment for the local community;</li> <li>▪ To train and capacitate the local communities.</li> </ul>	
<p><b><u>Target</u></b></p>	

- No complaints from the community;
- Equal opportunities for men and women;
- Training certificates;
- No complaints from displaced communities or individuals;
- Gender equality strategy; and
- Land Acquisition Process and Compensation Assessment and Action Plan.

### **Procedures**

#### *A. Waged Labor and Influx of Workers*

- Representatives from the various local municipalities can assist in determining local sub-contractors and labourers that should be considered for possible employment.
- The tender document should specify the use of local labourers or enterprises (where possible). It should be stipulated in the tender documentation that contractors use local labourers for manual and low skilled activities such as fencing and bush clearing. Where possible, on-site training should be undertaken to ensure long term benefits to the members of the community.

#### *B. Capacity and Skills Transfer*

- Stakeholders should be mutually accountable for increased opportunities regarding skills and competency development (general education and technical training). This training should be concentrated on skills that can be readily transferred to other employment opportunities in the local area, and only suitable qualified candidates in project management activities should be used.

#### *C. Gendered Division of Labor*

- Eskom's own internal policies and procedures should be used to ensure a fair and transparent recruitment process;
- Salaries of women should be equal to that of men when undertaking the same work;
- Training and skills development should take place for women; and
- Institute a well-designed gender equality strategy, if not available.

#### *D. Displacement and relocation of households*

- Negotiations should be approached with the necessary cultural sensitivity;
- Sufficient compensation and assistance with the relocation process;
- A Land Acquisition Process and Compensation Assessment and Action Plan must be developed.

### **Monitoring Responsibility and Frequency**

- Tender committee to monitor the tender adjudication;
- Eskom to continuously monitor the appointment of sub-contractors and the training programmes throughout the project duration; and
- A REP should continuously monitor the relocation and compensation of the displaced households/infrastructure.

### 3.2.2 CONTRACTOR TECHNICAL REQUIREMENTS AND THEIR CONTROL

CON-001	Site Establishment, Location and Contractor camps
<p><b><u>Legislative Requirements</u></b></p> <ul style="list-style-type: none"> <li>▪ Animal Protection Act (Act No. 71 of 1962);</li> <li>▪ Conservation of Agricultural Act (Act No. 43 of 1983);</li> <li>▪ Fencing Act (Act No.31 of 1963);</li> <li>▪ Hazardous Substances Act (Act No. 15 of 1973);</li> <li>▪ National Environmental Management Act (Act No. 107 of 1998);</li> <li>▪ National Environment Management: Air Quality Act (Act No. 39 of 2004)</li> <li>▪ National Environmental Management: Waste Act (Act No. 59 of 2008)</li> <li>▪ National Heritage Resources Act (Act No. 25 of 1999)</li> <li>▪ National Veld and Forest Act (Act No. 101 of 1998);</li> <li>▪ National Water Act (Act No. 36 of 1998)</li> <li>▪ Occupational Health and Safety Act (Act No. 85 of 1993) - Hazardous Substances Regulations</li> </ul>	
<p><b><u>Background</u></b></p> <p>The location of the construction camp is selected by the contractor, ECO and Project Manager who will take into account such aspects as access to the construction site, access to services and to materials. The contractor will enter into an agreement with a landowner for the establishment of the construction camp.</p> <p>The following impacts are expected during the establishment of the site camp and associated infrastructure;</p> <ol style="list-style-type: none"> <li>i. Removal of indigenous, protected plant species or red data species;</li> <li>ii. Damage to and/or loss of topsoil;</li> <li>iii. Compacting of ground;</li> <li>iv. Impacts on the surrounding environment due to inadequate sanitation and waste removal facilities at construction camp;</li> <li>v. Destruction of existing infrastructure, i.e., water pipelines, housing infrastructure;</li> <li>vi. Noise and air pollution as a result of vehicle movement; and</li> <li>vii. Impact on the visual environment due to the erected site offices.</li> </ol>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To plan construction methods that result in the least possible negative environmental impact and document these as Environmental Method Statements.</li> <li>▪ To minimize unnecessary damage to vegetation by determining the degree of clearing required and demarcate 'No-Go areas' before clearing begins;</li> <li>▪ To minimize damage to natural features;</li> <li>▪ To protect the public and ensure their safety from the works;</li> <li>▪ To prevent pollution of the environment;</li> </ul>	



- To increase the level of compliance with the environmental specifications contained in the EMPr by raising awareness of the requirements in environmental awareness training courses at all staff levels;
- To minimize environmental impact by siting the site camp/lay down area elements in areas where they have the least possible negative environmental impact whilst still being practical to the works; and
- To provide staff welfare facilities including toilets, drinking water and eating areas.

### **Target**

- Written agreement between landowner and contractor regarding occupation of construction site;
- No visible erosion scars once construction in an area is complete;
- All damaged areas are successfully rehabilitated one year after rehabilitation;
- All environmental method statements are provided by the Contractor prior to commencing with the activities governed by such method statements and are kept on file on site.
- Environmental awareness training registers are on file on site;
- The site camp and lay-down area is located in the approved position and its footprint minimized and demarcated, with no undue avoidable environmental impact e.g. on natural vegetation, storm water drainage, visual impact etc;
- Site is secure and there is no unauthorized entry;
- Adequate numbers of conveniently located site toilets are available on all work sites at all times in quantities related to the number of users; 1 toilet per 15 users; and
- Eating areas and drinking water provided to site staff in an easily accessible position.

### **Procedures**

#### A. Method Statements

- The Contractor shall provide all environmental method statements requested in writing by the Project Manager/ ECO for the ECO's approval prior to commencing with the activity addressed in each method statement;
- Approved Method Statements shall be readily available on the Site and shall be communicated to all relevant personnel and sub-contractors. The Contractor shall carry out the works in accordance with the approved Method Statement.
- The following method statements will be required by the Project Manager/ECO:

#### Site camp establishment

- The location, layout and method of establishment of the construction camp (including all buildings, offices, access routes, lay down yards, fuel storage areas and other infrastructure required for the running of the project).

#### Vegetation clearing

- Method of vegetation clearing during site establishment and disposal procedure for cleared material.

#### Fuel storage and use

- The design, location and construction of the fuel storage area, service areas as well as for the filling and dispensing from storage tanks and management of drip trays.

#### Restriction of working areas

- The position, type and height of all permanent and temporary fencing / pegging required for the demarcation of working and protected ("no-go areas") areas respectively. Include a program of installation.

Waste management

- Expected solid and liquid waste types, methods and frequency of collection and disposal as well as location of disposal sites. Include a recycling programme as part of a Waste Management Plan.

Hazardous substances

- Details of any hazardous substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

Cement and concrete batching

- Location, layout and preparation of concrete batching areas including the methods employed for the mixing and handling of cement products and particularly the containment of excessive runoff and waste-water from such areas, the method of transportation of concrete and containment of cement dust.

Emergency procedures

- Emergency procedures for fire and accidental leaks and spillages of hazardous substances (including fuel and oil). Include details of risk reduction measures to be implemented including firefighting equipment, fire prevention procedures and spill kits (materials and compounds used to reduce the extent of spills and to breakdown or encapsulate hydrocarbons).

Dust Control

- Details on the methods for managing dust on the site.

No-Go Areas

- Details on the methods for working in close proximity to any protected feature on or adjacent to the site e.g. small wetland, archaeological feature etc., including demarcation of works area, stockpile locations and rehabilitation actions.

*B. Environmental Awareness Training*

- The ECO shall present important environmental requirements as part of the compulsory Health and Safety induction meetings presented to all site staff and sub-contractors on site before such staff can perform duties on site.

*C. Site camp*

- Before construction commences, representatives from the local authorities, land owners and community-based organisation (e.g. residents association) should be informed about the details of the construction company, size of workforce and construction schedules;
- The location of the Contractor's construction site camp, and material lay down areas shall be specifically discussed and approved in writing by the Project Manager and ECO prior to the establishment and shall make use of areas of low ecological sensitivity within the site footprint;
- The site camp/lay-down areas shall be limited in area to only that which is essential and its extent shall be fenced or pegged for the duration of its lifespan on site; and
- The site camp should be fenced off and secured to control access.

*D. Site Access*

- Access for construction traffic will be required and maintained to all sites during the construction phase; and
- Where there is no existing access available or where ground conditions prevent normal access, temporary access routes may have to be constructed.

*E. Security*

- Access to the construction site should be strictly controlled; and
- No person shall enter the site unless authorized to do so by the ECO, project manager and the contractor.

*F. Drinking water*

- The Contractor shall ensure that drinking water is available for all staff on site. If no potable water source is available on site at any time then the Contractor shall import drinking water to the site.

*G. Eating areas*

- If employees are to eat elsewhere on site other than in the campsite/office area, the Contractor shall designate restricted, sheltered places for eating within the specified working areas. The Contractor shall provide adequate refuse bins with lids in all these places.

*H. Noise and air pollution*

- To minimize air and noise pollution, construction team shall use only equipment in good condition, which shall be properly maintained and shall not play loud music; and
- Disturbance or disruption of the daily lives of local communities and their livelihood, including noise and dust pollution shall be minimized in as far as is practicable.

*I. Sanitation*

- Ablution or sanitary facilities should not be located within 100m from a 1:100 year flood line including water courses, wetlands or within a horizontal distance of less than 100m, whichever is applicable;
- A minimum of one chemical toilet for every 15-contract personnel or alternatively 1 flush toilet for every 30 personnel, is to be provided on site in any given work area. All employees on site shall have easy access to these facilities (within 100 meters of their work site);
- Toilets must have doors and locks and portable chemical toilets shall be secured to prevent them from blowing over. Toilet paper shall be provided;
- The Contractor shall keep the toilets in a clean, neat and hygienic condition and chemical toilets shall be serviced at least once per week;
- Chemical toilets are to be emptied prior to builder's holidays/temporary closure. The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site. Discharge of waste from toilets into the environment and burial of waste is strictly prohibited.

*J. Waste Disposal*

- Solid waste shall be stored in an appointed area within the site camp in drums/skips covered with a strong, tight-fitting lid to keep out insects and rain;
- Disposal of solid waste shall be at approved landfill site;
- A bin system shall be established through the use of the separation bins for recyclable materials and non-recyclable waste materials; and
- Bins should be emptied before there is so much rubbish it overflows onto the ground or the lid cannot be put on properly.

**Monitoring Responsibility and Frequency**

- The Contractor shall monitor the site daily with respect to compliance with the specifications.
- The Environmental Control Officer shall monitor minimum weekly that the specifications are complied with and provide the Contractor and Project Manager with an inspection report of any

<p>specifications not adequately complied with and how to rectify this.</p> <ul style="list-style-type: none"> <li>▪ The Environmental Control Officer shall provide quarterly summary reports of compliance to the project team and DEA.</li> </ul>
<p><b><u>Relevant Documents / Sections</u></b></p> <ul style="list-style-type: none"> <li>▪ CON-004;</li> <li>▪ PHY- 007;</li> <li>▪ SOC-001;</li> <li>▪ BIO-001;</li> <li>▪ Eskom Transmission Vegetation Management Guidelines;</li> <li>▪ Eskom Standard for bush clearance and the maintenance of over- head power line route;</li> <li>▪ Eskom Oil spill clean up; and</li> <li>▪ Eskom Transmission Line Towers and Line Construction.</li> </ul>

<b>CON-002</b>	<b>Workshop and Equipment Storage Areas</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Hazardous Substances Act (Act No. 15 of 1973);</li> <li>▪ National Environment Management: Air Quality Act (Act No. 39 of 2004);</li> <li>▪ National Environmental Management: Waste Act (Act No. 59 of 2008);</li> <li>▪ National Water Act (Act No. 36 of 1998)</li> <li>▪ Occupational Health and Safety Act (Act No. 85 of 1993)</li> </ul>	
<p><b><u>Background</u></b></p> <p>These areas are used to store equipment and to park site vehicles.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To minimise groundwater pollution;</li> <li>▪ To keep a neat construction camp.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ No litigation due to transgression of pollution control acts; and</li> <li>▪ No complaints from landowners.</li> </ul>	
<p><b><u>Procedures</u></b></p> <p><i>A. Spills</i></p> <ul style="list-style-type: none"> <li>▪ Vehicles re-fuelling should only occur on flat level ground on a concrete floor where there is little chance of a spilled substance reaching water features;</li> <li>▪ On-site vehicles will be monitored for fluid leaks and will receive regular maintenance to reduce the chance of leakages; and</li> </ul>	

- It is important that any significant spillage of chemicals, fuels, etc. during the construction phase and/or operational phase is reported to DWS and other relevant authorities. In the event of a spill, the following steps can be taken:
  - i. Stop the source of the spill;
  - ii. Contain the spill;
  - iii. Remove the spilled product for treatment and authorised disposal;
  - iv. Determine if there is any soil, groundwater or other environmental impact;
  - v. If necessary, remedial action must be taken in consultation with this DWS; and
  - vi. Incident must be documented.

*B. Workshop and Wash bay*

- Storage areas must be located outside the 1:100 year flood-line of the water source and must be fenced to prevent unauthorized access into the area;
- The workshop shall have a smooth, impermeable (concrete) floor;
- The floor shall be bunded and sloped towards an oil separator to contain any spillages;
- All vehicles and equipment shall be kept in good working order to maximise efficiency and minimise pollution;
- All maintenance, including washing and refuelling of plant on site shall take place at designated locations at the workshop area;
- Washing of equipment shall be restricted to urgent maintenance requirements only;
- If it is necessary to do maintenance outside of the workshop area, approval from the Project Manager & ECO needs to be obtained prior to commencement of activities;
- No contamination of soil or vegetation will be allowed during any emergency equipment maintenance;
- When servicing equipment on-site, portable drip trays shall be used to collect the waste oil and other lubricants. Drip trays shall also be provided in construction areas for stationary equipment (such as compressors) and for "parked" equipment (such as excavators, loaders and cranes);
- If practicable, equipment should be covered so that rainwater is excluded from the drip trays; and
- Oil from the drip trays shall be stored in drums in a bunded area as required for fuel storage.

**Monitoring Responsibility and Frequency**

- The ECO to undertake weekly inspection of hazardous material storage areas to check for leakage;
- The contractor EO to undertake daily on-site vehicle checks for fluid leaks;
- Regular inspection of the oil catchment area around the transformers by the EO and ECO; and
- The ECO to compile monthly audit reports on incident reports.

**Related Section**

CON-003.

<b>CON-003</b>	<b>Servicing of vehicles</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Hazardous Substances Act (No. 15 of 1973) and Hazardous Chemical Substances Regulations (August 1995); and</li> <li>▪ Occupational Health and Safety Act (No 85 of 1993) - Hazardous Chemical Substances regulations (25 August 1995).</li> </ul>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ Prevention of pollution of the environment; and</li> <li>▪ Minimise chances of transgression of the acts controlling pollution.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ No pollution of the environment;</li> <li>▪ No litigation due to transgression of pollution control acts; and</li> <li>▪ No complaints from landowners.</li> </ul>	
<p><b><u>Procedures</u></b></p> <ul style="list-style-type: none"> <li>▪ Vehicles re-fuelling should only occur on flat level ground on a concrete floor where there is little chance of a spilled substance reaching water features;</li> <li>▪ On-site vehicles should be monitored for fluid leaks and should receive regular maintenance to reduce the chance of leakages;</li> <li>▪ All vehicles shall be serviced in the designated area inside the Contractors camp where all run-off from this area is contained and allowed to flow towards a sump. In the event of a breakdown in the veld, any oil spills shall be cleaned up immediately. The following shall apply:</li> <li>▪ All contaminated soil shall be removed and be placed in containers. Contaminated soil can be taken to one central point at the Contractors campsite where it can be later disposed of at a permitted hazardous waste landfill;</li> <li>▪ The ECO must be consulted should any queries arise in this regard;</li> <li>▪ All oil spills must be reported to the ECO and Project Manager; and</li> <li>▪ All old parts, packaging, old oil, etc. 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 indiscriminately.</li> </ul>	
<p><b><u>Monitoring Responsibility and Frequency</u></b></p> <ul style="list-style-type: none"> <li>▪ Daily on-site vehicle checks for fluid leaks by Contractor's EO; and</li> <li>▪ Monthly audit reports on incident reports by ECO.</li> </ul>	
<p><b><u>Related Section</u></b></p> <p>CON-002.</p>	

<b>CON-004</b>	<b>Storage areas and handling of Hazardous Substances</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Hazardous Substances Act (Act No. 15 of 1973);</li> <li>▪ National Environmental Management: Waste Act (Act No. 59 of 2008);</li> <li>▪ National Water Act (Act No. 36 of 1998); and</li> <li>▪ Occupational Health and Safety Act (Act No. 85 of 1993) - Hazardous Chemical Substances regulations (25 August 1995)</li> </ul>	
<p><b><u>Background</u></b></p> <ul style="list-style-type: none"> <li>▪ Petrol, diesel, solvents and other flammable substances may be stored and used on site. These are hazards to the natural environment, landowners, community members and the general public;</li> <li>▪ There are associated fire risks to such activities as well as environmental pollution risks to soil and ground water in the case of spillages.</li> </ul>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To ensure environmental best practice in terms of the storage and handling construction materials and equipment; and</li> <li>▪ To ensure that storage and handling of chemicals and hydrocarbons on-site do not cause pollution to the environment or harm to people.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ Storage facilities including approved location, ventilation, bunding and signage.</li> <li>▪ All spillages are adequately treated.</li> <li>▪ Required drip trays in place.</li> </ul>	
<p><b><u>Procedures</u></b></p> <p>Before construction starts, there is need to train the employees with regards to this plan. The following shall therefore be done:</p> <ul style="list-style-type: none"> <li>▪ The contractor shall arrange for the site induction on the hazardous materials awareness issues before commencement of the project;</li> <li>▪ The contractor shall ensure that adequate training of all the personnel working on the site familiarise with the contents of the spillage prevention and response plan. These procedures must include removal/disposal of potentially contaminated water and soil;</li> <li>▪ The contractor shall also make this training and awareness programme be conveyed to the personnel on site to the satisfaction of the Health and Safety Officer (HSO), either in written format or verbal, in the employees' language of choice.</li> <li>▪ The contractor should keep records of all training sessions, including names, dates and the information presented.</li> </ul> <p>A. <u>Storage</u></p> <ul style="list-style-type: none"> <li>▪ Before containment or storage facilities can be erected, the contractor shall furnish the Project Manager and ECO with a <b>METHOD STATEMENT</b> that details the location of the storage facilities on the layout map of the construction site camp, preventative measures which are proposed to be installed in order to mitigate against pollution of the surrounding environment from leaks or spillage;</li> </ul>	

- Storage of hazardous materials shall not take place within 500m of any water feature;
- Materials on site will be stored in their sealed containers on bunded concrete floor. All containers should be labelled properly as to their contents. All hazardous substance containers must be in good condition and compatible with the materials stored within as per the relevant oil industry standards and SANS codes;
- All hazardous materials will be stored in a secured, appointed area that is fenced and has restricted entry;
- In addition, hazard signs indicating the nature of the stored materials shall be clearly displayed on the storage facility or containment structure;
- Material Safety Data Sheets (MSDS) of all chemical materials stored on site should be available on site;
- All hazardous substance containers must be accessible and spacing between containers must provide sufficient access to perform periodic inspections and respond to releases;
- Any spills on the exterior of the container must be cleaned immediately; and
- All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the contractor to, and used or worn by the staff whose duty it is to manage and maintain the supplier's plant, machinery and equipment.

**B. Maintenance**

- All chemicals that are transferred from larger to smaller containers must be transferred by use of a funnel or valve;
- All hazardous substance containers should be closed while not in use;
- Use drip pans or other collection devices to contain drips or leaks from dispensing containers or equipment;
- Immediately clean up and properly manage all small spills or leaks;
- Periodically inspect equipment and hazardous substance storage areas to ensure leaks or spills are not occurring;
- Keep all work areas and hazardous substance storage areas clean and in good general condition; and
- In the event of a spill, the area affected must be cleaned up and rehabilitated. All material generated during the clean-up operation must be disposed of at a suitable licenced landfill site with chain of custody documentation supplied as proof of the end recipient.

**Monitoring Responsibility and Frequency**

- The Contractor shall monitor the site daily with respect to compliance with the specifications;
- The ECO shall monitor minimum weekly that the specifications are complied with and provide the Contractor and Project Manager with an inspection report of any specifications not adequately complied with and how to rectify this;
- A complaints register shall be maintained, in which any complaints from the landowners and community will be logged. Complaints shall be investigated and if appropriate acted upon;
- An incident reporting system (which is in line with Eskom's requirements) should be used to record non-conformances to this EMP; and
- The ECO shall provide summary reports of compliance to the project team and DEA.

**Related Documents / Sections**



- Oil spill clean-up and rehabilitation-Eskom's standard.

CON-005	No-go Areas
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Limpopo Environmental Management Act (Act No. 7 of 2003);</li> <li>▪ National Environmental Management Act (Act No. 107 of 1998);</li> <li>▪ National Environmental Management: Biodiversity Act (Act No. 10 of 2004);</li> <li>▪ National Forest Act (Act No. 84 of 1998); and</li> <li>▪ National Heritage Resources Act (Act No. 25 of 1999).</li> </ul>	
<p><b><u>Background</u></b></p> <p>Sections of the proposed project area are characterised of nature reserves that have indigenous forests, intact grasslands, fauna. In addition, the corridor is also characterised of rocky outcrops, kloofs, watercourses, graves and archaeological objects.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To minimise the potential for damage or disturbance to these sensitive areas through construction activities.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ Sensitive features, protected vegetation, safety risk areas, graveyards etc termed as "no-go" areas are designated clearly by means of suitable demarcation fencing/pegging where these are close to the work sites and in danger of accidental damage /staff ingress; and</li> <li>▪ Sensitive features remain intact and undamaged.</li> </ul>	
<p><b><u>Procedures</u></b></p> <p><i>A. Demarcation</i></p> <ul style="list-style-type: none"> <li>▪ No-go areas include areas indicated in the Sensitivity Map or by the ECO in consultation with landowners as a "no-go areas" such as rocky outcrops, water courses, dams, etc. No-go areas must be cordoned off prior to any vegetation clearance and or any other construction activities begin in the area;</li> <li>▪ The demarcation of these areas is to be maintained by the contractor throughout the construction phase. Under no circumstances may construction activities, vehicles, contractors' personnel and workforce enter or utilise these areas at any time. Strict management of this aspect must be closely monitored by the ECO;</li> <li>▪ All areas outside the demarcated servitude should be declared as no-go areas especially within the nature reserves;</li> <li>▪ All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction;</li> <li>▪ All private property outside of the construction areas as set out in the site layout plan shall be considered no-go areas;</li> <li>▪ Unless construction activities are specifically for approved construction activities within 500m of rivers/ wetlands or river rehabilitation, the river/wetland is to be considered a "no-go" area. These works are to be closely supervised by the ECO;</li> </ul>	

- The contractor is discouraged from using plastic warning tapes instead fencing should be used; and
- “No entry” signs must also be erected at strategic points around all, wetlands, streams and rivers” which are in close proximity to access roads, servitude and tower locations. Construction of new/temporary bridges across non-perennial streams and larger rivers is regarded a prohibited activity. Use should be made of existing crossings, ensuring proper maintenance/upgrade.

*B. Heritage*

- All artefacts over 60 years of age and all fossils are protected by law. Should anything of an archaeological nature be found on site by the Contractor (or any other party), e.g. stone hand tools, remnants of old structures not previously visible, , human remains etc, work is to be stopped in the area immediately, and the ECO/ Project Manager notified. Failure to notify such of a find will result in a penalty. This aspect must be carefully explained to workers during the Environmental Awareness Programme;
- The ECO shall record (photos and GPS location) and safeguard any suspected artefacts/fossils and will advise on demarcation of this area and, where impacted by the construction footprint, notify Eskom who will notify the relevant specialist to view material and ascertain whether further recovery of the artefact or further study of the area is required (at the Eskom's expense);

*C. Protected vegetation*

- Any vegetation specifically marked for protection by the ECO shall be avoided by construction/contractor activities as per an approved Method Statement.

**Monitoring Responsibility and Frequency**

- The Contractor shall monitor the site daily with respect to compliance with the specifications;
- The ECO shall monitor minimum weekly that the specifications are complied with and provide the Contractor and Project Manager with an inspection report of any specifications not adequately complied with and how to rectify this; and
- The ECO shall provide quarterly reports of compliance to the project team.

**Relevant Documents/ Sections**

- PHY-007;
- CUL-001;
- PHY-003; and
- Eskom Vegetation Management Guidelines.

3.2.3 PHYSICAL ISSUES AND THEIR CONTROL

<b>PHY-001</b>	<b>Terrain</b>
<b><u>Legislation</u></b>	
<ul style="list-style-type: none"> <li>▪ National Environmental Management Act (Act No. 107 of 1998);</li> <li>▪ National Environmental Management: Biodiversity Act (Act No. 10 of 2004); and</li> <li>▪ National Forest Act (Act No. 84 of 1998).</li> </ul>	
<b><u>Background</u></b>	

The power line will traverse areas that are characterised of undulating plains, low and high hills. The area required for the project will undergo a change due to cutting, stripping, excavation, and levelling, landscaping, loss of vegetative cover and erection of the towers.

### **Management Objectives**

- Minimise erosion damage on gully crossings; and
- Minimise damage to topsoil and environment at tower positions.

### **Targets**

- Control structures installed and operational to earthworks commencing;
- All stockpiled material adequately stabilized and protected; and
- All site cut-off drains unobstructed.

### **Procedures**

#### *A. Construction Footprint*

- Construction is limited to the 55m servitude in which the line will be constructed;
- Any extra space outside the servitude shall be negotiated with the relevant landowner and approved by Eskom;
- All areas marked by the ECO as 'no-go' areas inside the servitude must be treated with the utmost care and responsibility, with absolutely no access allowed; and
- The ECO must ensure that the contractor maintains the demarcation of the no-go areas at all times.

#### *B. Site Clearance*

- All earthworks and excavations must be undertaken in such a manner as to minimise the extent of any impacts caused by such activities;
- The topsoil, 30-50cm of the top soil, must be stockpiled in a suitable place in order to be replaced on top of the exposed subsoil during rehabilitation;
- Soil stockpiles should not exceed 1.5m in height;
- Erosion damage to soil stockpiles should be prevented with soil conservation works such as deflection berms; and
- After completion of construction, the site should be cleared of all excavated material and construction rubble, waste, litter and properly rehabilitated/ revegetated.

#### *C. Erosion Control*

- All areas susceptible to erosion should be protected and there should be no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas;
- Natural trees, shrubbery and grass species should be retained wherever possible;
- Cleared areas should be stabilised and managed to prevent and control erosion. Method of stabilisation shall be determined in consultation with the Project Manager;
- Do not permit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the Work Area;
- Avoid access into seasonally wet areas and / or turf soils during and immediately after rainy periods, until such a time that the soil has dried out;

- Utilize only light equipment for access and deliveries into areas of unstable soils, in areas where erosion is evident, and at stream and river embankments;
  - Limit vehicular access into rocky outcrops and ridges;
  - Institute adequate sedimentation control measures at river crossings;
  - Preserve vegetation so that it can act as a buffer in flood plains, wetlands, stream banks and steep slopes in the hilly and ridge areas where the power lines traverse across;
  - Do not allow erosion to develop on a large scale before effecting repairs. When in doubt, seek advice from the ECO; and
  - The ECO is to provide permission prior to any vegetation being cleared for development;
- D. Rehabilitation*
- The seeds collected before the construction phase can also be replanted directly on site after the construction and during the operational phase of the substations and power lines when the re-vegetation and habitat rehabilitation plan is being implemented;
  - Potential threats such as fires and alien plant invasion should be monitored by the ECO to provide the ideal conditions of survival for important plant taxa that has been reintroduced in the site;
  - Pre-construction photographs can be taken to determine the loss of natural landscape and later compared to the rehabilitated land to obtain an indication of overall success in re-vegetation and rehabilitation;
  - The survival rate of transplanted and translocated flora (especially important taxa flora) can give an indication to the overall success of the re-vegetation and rehabilitation and provide important data to better future approaches; and
  - Permanent stabilization, i.e., re-vegetation will be done immediately after construction and no later than 14 days post construction of the line.

**Monitoring Responsibility and Frequency**

- The ECO should submit weekly and monthly progress reports that include:
  - Estimated species coverage and diversity.
- The contractor’s EO should inspect erosion control infrastructure; and
- The ECO should monitor site clearance as and when it occurs.

**Related Documents/ Sections**

- Eskom Vegetation Management Guidelines;
- Standard for bush clearance and the maintenance of over-head power line route;
- Soil erosion Guideline; and
- CON-004.

<b>PHY-002</b>	<b>Wet Areas</b>
<b><u>Legislation</u></b>	
<ul style="list-style-type: none"> <li>▪ National Water Act (No 36 of 1998)</li> </ul>	
<b><u>Background</u></b>	

- Soil erosion from servitude clearing would increase sedimentation in local streams;
- Fuel, oil and other lubricants utilised during the construction of the power lines can leak and pollute the underground water;
- Landscaping may have an indirect impact on the existing drainage lines and dry water courses by causing increased run off, erosion and limited seepage;
- Formation of new drainage lines may also take place due to obstructions to water flow; and
- Inadequate maintenance of sanitary ablutions may lead to ground water contamination.

### **Management Objectives**

- To prevent damage by avoiding wet areas; and
- To minimize or reduce ground water pollution.

### **Target**

- Re-vegetation of disturbed riparian zones;
- No damage to wet areas;
- No complaints from landowners and litigation; and
- Storm-water and erosion control in place.

### **Procedures**

#### *A. General*

- Vehicular traffic shall not be allowed in permanently wetted areas such as wetlands, rivers, streams and dams. See the Sensitivity map for the wetted areas. Only existing roads through such areas may be used with the approval of Eskom, the ECO and the landowner;
- Storm-water controls, erosion and sediment controls should be in place during the construction;
- No equipment shall be used which may cause irreparable damage to wet areas. The contractor shall use alternative methods of construction in such areas;
- "NO ENTRY" signs, in consultation with the ECO and landowner, must be strategically placed at all wet areas which are in close proximity to access routes, the servitude and towers where contractors may take short cuts across/through them. The ECO must strictly monitor this aspect as well as the maintenance of these signs for which the contractor is responsible;
- The ECO must assess whether regular water sampling of surface and or ground water resources within the immediate and surrounding environment is necessary before construction commences. Should this be the case, baseline data from sampling must be obtained relevant to the activity and sensitivity of the area. Regular sampling must then be carried out to determine deviations from the baseline data;
- Adjacent wetlands and streams shall be protected from construction site run-off with appropriate erosion and sediment control feature to include by not limited to hay bales and silt fences;
- Storm water, wherever possible, should be allowed to soak into the land in the area on which the water fell;
- No water may be abstracted from any surface water body for the purpose of construction unless permitted in terms of the Contract and Department of Water and Sanitation, or specifically authorized by the ECO;

- Over-wetting, saturation and unnecessary run-off during dust control activities should be avoided;
- All waste produced during construction must be stored in waste storage receptacles or skips covered or lidded and disposed of at a licenced landfill site;
- Clean-up plan/strategy should be in place in the event that spills occur; and
- Chemical ablution facilities should be in place to ensure that no sewerage spills into streams and wetlands. Collection pans should be placed underneath the mobile toilets to act as secondary containment.
- There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in nature and game reserves.

#### *B. Contaminated water management*

- Appropriate pollution control facilities to prevent discharge of water containing polluting matter or visible suspended materials into water courses or clean water systems shall be designed and implemented;
- Run-off from vehicles, wash bays, workshops and diesel / fuel tank areas shall pass through oil traps. The oil sludge thus collected shall be disposed of at an approved waste disposal site, i.e. licensed for such material;
- All spillage of oil onto concrete surfaces shall be controlled by the use of an approved absorbent material such as drizit;
- Contaminated water on soil will be contained as soon as possible. The incident reporting procedure will be followed and the necessary mitigation measures put in place;
- Clean storm water run-off will be allowed to enter clean water systems (i.e. water not associated with the construction activities such as rain water); and
- Any water pollution incident needs to be reported immediately to the EO. Whereby the incident reporting procedure will be followed.

#### *C. Habitat Destruction*

- Existing roads must be used as far as possible for access during construction;
- Where traces of water bodies are identified care should be taken in the vicinity of those water bodies found within the study area;
- Pollution and littering must be managed in order not to further disrupt habitat;
- The smallest possible footprint should be utilized and positioned far from the boundary of the affected watercourse; and
- Excavated watercourses should be re-sloped to a stable gradient (e.g. at least a slope of 1:3), re-vegetated with naturally occurring indigenous species or annual grass species such as *Eragrostis curvula*.

#### *D. Water Quality*

- No re-fuelling of construction vehicles should occur within 32m of demarcated watercourses;
- Hydrocarbons should not be stored within 32m of watercourses;
- Use of guidelines for implementing Clean Technologies (e.g. Biological treatments i.e. trickling filtration, membrane bioreactors, fixed film reactors);
- No littering on riparian zones of drainage lines/water courses;

- All daily activities that could involve the generation of waste should be restricted to the construction site and away from any watercourse;
- Wetland systems and their buffer zones should be regarded as no-go areas during the project life-cycle; and
- A storm-water management plan should be developed so as to reduce the risk of water quality deterioration associated with storm-water release.

*E. Soil Erosion*

- Reduce clearing to a minimum to maintain vegetation cover;
- Low level water deflection berms should be constructed to minimise soil erosion;
- Run-off should be controlled before it develops into an erosive force;
- A channel for runoff should be created to avoid numerous runoff channels that erode the soil; and
- Re-vegetate cleared soil after construction, for the control of soil erosion and water capacity.

*F. Alien Invasive Species*

- Alien invasive species should be removed to allow native vegetation to grow to its potential;
- Re-vegetation of native species;
- Removal of alien invasive species and monitoring of the environment to keep invasive species to a minimum should they occur; and
- Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the power line and take immediate corrective action where invasive species are observed to establish. Eradication of invasive species and weeds during the construction phase

*G. Legal*

- In the event of pollution caused as a result of construction activities, the Contractor, according to section 20 of the National Water Act, 1998 (Act No. 36 of 1998) is responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas; and
- Work within 500m of watercourses is prohibited without a General Authorisation or a Water Use Licence.

**PLEASE NOTE:**

- The Contractor and ECO are to ensure that **method statements** for specific wet areas (Olifants, Ga-Selati, Groot Letaba and other ephemeral and non-perennial streams) are developed and approved **prior to any construction activity in these areas**".

**Monitoring Responsibility and Frequency**

- ECO will undertake regular monitoring and maintenance of all sediment retention devices throughout the construction works to ensure the operation of such devices is optimized throughout construction works.
- The ECO shall monitor minimum weekly that the specifications are complied with and provide the Contractor and Project Manager with an inspection report of any specifications not adequately complied with and how to rectify this.

**Relevant Documents/ Sections**

- CON-004;

- PHY-003

<b>PHY-003</b>	<b>River Crossings</b>
<b><u>Legislature</u></b>	
National Water Act (No 36 of 1998)	
<b><u>Background</u></b>	
<ul style="list-style-type: none"> <li>▪ Siltation of rivers; and</li> <li>▪ Pollution of surface water.</li> </ul>	
<b><u>Management Objectives</u></b>	
<ul style="list-style-type: none"> <li>▪ To minimise erosion of embankments and subsequent siltation of rivers and streams; and</li> <li>▪ To minimise damage to river and stream embankments.</li> </ul>	
<b><u>Targets</u></b>	
<ul style="list-style-type: none"> <li>▪ No new access roads through river and stream banks; and</li> <li>▪ No visible erosion scars on embankments once construction is completed.</li> </ul>	
<b><u>Procedures</u></b>	
<p><i>A. General</i></p> <ul style="list-style-type: none"> <li>▪ Stream and river crossings shall be avoided as far as practicable as they may cause erosion and downstream siltation;</li> <li>▪ Existing drifts and bridges may be used if the landowner gives his consent. Such structures shall then be thoroughly examined for strength and durability before they are used;</li> <li>▪ New drifts and bridges shall only be constructed with the approval of Eskom, DWS, DEA and the landowner and at the discretion of the Environmental Control Officer. The ECO and Contractors must implement strict control of the footprint especially at river crossings to ensure damage to riparian habitats is minimised. An environmental authorisation may be required under the National Environmental Management Act (No. 107 of 1998);</li> <li>▪ The site will establish appropriate erosion and sediment control measures such as hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers.</li> <li>▪ <b>"NO ENTRY"</b> signs, in consultation with the ECO and landowner, must be strategically placed along rivers, streams and other natural or man-made drainage lines which are in close proximity to access routes, the servitude and towers where contractors may take short cuts across/through them;</li> <li>▪ The ECO must strictly monitor this aspect as well as the maintenance of these signs for which the contractor is responsible; and</li> </ul>	



<p>References to specific river crossings along the alignment are indicated in the Sensitivity Map.</p> <p><i>B. Riparian Vegetation</i></p> <ul style="list-style-type: none"> <li>▪ Avoid driving on watercourses during construction of power line to prevent the potential for channel initiation. Where this is unavoidable crossing structures should be in place across affected wetlands and other watercourses along with a relevant Water Use License (WULA);</li> <li>▪ No hard surface infrastructure, construction camps or quarries should be constructed within buffered watercourses, apart from unavoidable road crossings, which should be minimized and be approved by the relevant regulatory authorities; and</li> <li>▪ Watercourses affected by unavoidable construction activities should be re-sloped to a stable gradient (e.g. at least a slope of 1:3), revegetated with suitable indigenous plant species to help facilitate revegetation soon after construction.</li> </ul> <p><i>C. Sedimentation of rivers and streams</i></p> <ul style="list-style-type: none"> <li>▪ Adequate storm water drainage system must be designed and maintained to adequately control the volume, speed, location of runoff, to avoid soil erosion and siltation of water courses;</li> <li>▪ No activity such as temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment or any other use of the buffer/flood zone whatsoever, may be permitted during the construction phase;</li> <li>▪ Re-profiling of the banks of disturbed wetland areas should be done; and Monitor all systems for erosion and incision.</li> </ul> <p><i>D. Legal</i></p> <ul style="list-style-type: none"> <li>▪ Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act, 1998 (Act No. 36 of 1998), and therefore may well require the application of a Water Use License or a General Authorisation. Therefore, the contractor must in consultation with the ECO, assess all areas along the alignment well in advance in order to ensure if the works proposed are addressed in the General Authorisation.</li> </ul> <p><b>PLEASE NOTE:</b></p> <ul style="list-style-type: none"> <li>▪ The Contractor and ECO are to ensure that <b>method statements</b> for specific river crossings are developed and approved <b>prior to any construction activity in these areas</b>".</li> </ul>	
<p><b><u>Monitoring Responsibility and Frequency:</u></b></p> <ul style="list-style-type: none"> <li>▪ ECO will undertake regular monitoring and maintenance of all sediment retention devices throughout the construction works to ensure the operation of such devices is optimized throughout construction works.</li> </ul>	
<p><b><u>Related Documents/ Sections</u></b></p> <ul style="list-style-type: none"> <li>▪ CON-004; and</li> <li>▪ PHY-002.</li> </ul>	

<b>PHY-004</b>	<b>Storm-water and Erosion Management</b>
<b><u>Legislation</u></b>	
<ul style="list-style-type: none"> <li>▪ The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).</li> </ul>	
<b><u>Background</u></b>	

Erosion and sedimentation are naturally occurring processes that are unnaturally accelerated by land development. Erosion is primarily influenced by four factors, i.e., climate, soil type, topography and vegetation. The risks of erosion are highest in areas with fine soils, on steep slopes, and areas undergoing active construction activities.

### **Management Objectives**

- To minimise erosion on site and along gravel access roads during construction;
- To minimise erosion damage on gully crossings;
- To minimise impeding the natural flow of water;
- To provide permanent erosion and sediment control measures, where required; and
- To minimise the risk of sedimentation of water resources during the construction phase.

### **Targets**

- No disturbance to gully embankments;
- No erosion visible on gully embankments due to construction activities; and
- No interference with the natural flow of water.

### **Procedures**

#### *A. General*

- Crossing of dongas and eroded areas shall be thoroughly planned;
- Water diversion berms shall be installed in consultation with ECO at donga crossings to ensure runoff water on the servitude does not run into dongas and cause an erosion hazard;
- Strict control of the footprint must be implemented especially near eroded areas and donga crossings;
- Areas of exposed erodible soil in the course of construction operations shall be shaped to permit storm runoff with minimum erosion. Temporary berms, slope drains, diversion mounds and sedimentation basins shall be required where possibilities for water pollution exist and permanent erosion controls are not completed or operative;
- Sediment fences should be used where temporary sediment control is required. The fences will dissipate storm-water velocity collecting moving solids;
- The temporary sediment fences will need to be positioned where erosion is most severe, i.e., near the drainage lines and streams and at steep slopes where vegetation has been removed;
- Sediment fences will also be placed downstream of stockpiles and disturbed areas. Prior to construction, the ECO and engineer will provide a map indicating these areas;
- Existing roads and services must be utilised as far is practicably possible thus reducing the infringement of the line construction on surrounding natural habitat and reducing the risk of erosion; and
- **"NO ENTRY"** signs, in consultation with the ECO and landowner, must be strategically placed at eroded areas or dongas, which are in close proximity access routes, the servitude and pylons where contractors may take short cuts across/through them. The ECO must strictly monitor this aspect as well as the maintenance of these signs for which the contractor is responsible.

*B. Spoil Sites*

- The contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site used during the contract period. This shall include existing spoil sites that are being re-entered;
- Before spoil sites may be used, proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the Engineer for approval;
- A photographic record shall be kept of all spoil sites for monitoring purposes, and must include photographs of before the site is used, as well as after re-vegetation;
- The affected landowner must be consulted and must provide consent for the location of these spoils sites on his property;
- No spoil site shall be located within 500 m of any watercourse;
- The use of spoil sites for the disposal of hazardous or toxic wastes shall be prohibited;
- Spoil sites will be shaped to fit the natural topography. These sites shall receive a minimum of 75 mm topsoil and be grassed with the recommended seed mixture. Slopes shall not exceed a vertical: horizontal ratio of 1:2. Only under exceptional circumstances shall approval be given to exceed this ratio; and
- The Engineer may only approve a completed spoil site at the end of the construction period upon receipt from the contractor of a landowner's clearance notice and an engineer's certificate certifying slope stability.

*C. Stockpiles*

- Topsoil is to be handled twice only – once to strip and stockpile, and once to replace and level;
- Ensure that all topsoil is stored in such a way and in a place that it will not cause the damming up of water, erosion gullies, or wash away itself;
- The project area is characterized of numerous drainage lines, the ECO and contractor should ensure that top soil is not stockpiled in and near drainage lines;
- Do not stockpile topsoil in heaps exceeding 2m in height;
- In determining the location of these temporary stockpile areas, cognisance must be taken of sensitive and no-go areas such as the low ridges, hills, rivers and drainage lines; and
- Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of these temporary stockpiles, the contractor shall at all times ensure that they are constructed and maintained to avoid erosion of the material and contamination of the surrounding environment. As far, as is possible, topsoil should not be stored for longer than 3 months.

*D. Storm-water Control*

- Consideration should be given to the creation of artificial wetlands for the treatment of storm water run-off, particularly from areas where fertilizers, herbicides and pesticides are likely to be used (the agricultural areas in close proximity to Groot Letaba);
- Measures such as vegetated swales and cut-off drains must be provided in order to help divert poor quality storm-water runoff to artificial wetlands, if created on site. Vegetative swales can help reduce runoff velocity, thereby allowing for better infiltration capability;
- The provision of rainwater tanks is recommended to help store away excess water, which may

<p>create potential for flooding. Rainwater runoff from roofs of construction camp buildings must be directed into rainwater tanks, this water can be used for dust control; and</p> <ul style="list-style-type: none"> <li>▪ Ensure that no existing wetlands are destroyed as these features have tremendous capacity to absorb and later release water generated by flash floods in natural pulses.</li> </ul> <p><i>E. Legal</i></p> <ul style="list-style-type: none"> <li>▪ Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act 1998 (Act No. 36 of 1998), and therefore may well require the application of a Water Use License or a General Authorisation. Therefore, the contractor must in consultation with the ECO, assess all areas along the alignment well in advance in order to ensure the proposed works are addressed in the General Authorisation/WUL.</li> </ul> <p><b>PLEASE NOTE:</b></p> <p>The Contractor and ECO are to ensure that <b>method statements</b> for storm-water and erosion management are developed and approved <b>prior to any construction activity</b>.</p>
<p><b><u>Monitoring Responsibility and Frequency:</u></b></p> <ul style="list-style-type: none"> <li>▪ The ECO and contractor’s EO should undertake on-going monitoring of areas with soil susceptible to erosion to ensure that formation of gullies is avoided;</li> <li>▪ The ECO and contractor’s EO should undertake on-going monitoring of erosion and sediment control measures to determine their effectiveness;</li> <li>▪ Daily visual inspection of sediment control devices should be done by the EO;</li> <li>▪ Sediment controls will be reviewed during site inspections and/or after significant rainfall (more than 10mm in 24hrs resulting in site runoff) by the ECO.</li> </ul>
<p><b><u>Related Documents/ Sections</u></b></p> <ul style="list-style-type: none"> <li>▪ Eskom Soil Erosion Guideline;</li> <li>▪ Eskom Transmission Line Towers and Line Construction;</li> <li>▪ PHY-001;</li> <li>▪ PHY-002; and</li> <li>▪ PHY-003.</li> </ul>

<b>PHY-005</b>	<b>Access Roads</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ National Water Act 1998 (Act No. 36 of 1998); and</li> <li>▪ Road Traffic Act of 1989 (Act No. 29 of 1989).</li> </ul>	
<p><b><u>Background</u></b></p> <p>Services Access for construction traffic will be required and maintained to all sites during the construction phase.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ Minimise damage to existing access roads;</li> </ul>	

- Minimise damage to environment due to construction of new access roads; and
- Minimise loss of topsoil and enhancement of erosion.

### **Targets**

- Non-congestion of roads;
- Documented agreements concerning construction or upgrading of access roads.

### **Procedures**

#### *A. General*

- All agreements reached should be documented and no verbal agreements should be made;
- Construction work must not commence prior to access roads having been approved by the ECO, landowners and ESKOM;
- Should existing roads be utilised it is advised that the ECO record and document (in writing with photographs) the original condition of these roads before construction activities commence. The Contractor shall properly mark all access roads. Markers shall show the direction of travel as well as tower numbers to which the road leads. Roads not to be used shall be marked with a "NO ENTRY" sign;
- No roads must be constructed on slopes of more than 20% unless such roads follow contours. In such areas, the Contractor shall only use existing roads or alternative methods of construction. The Contractor must take such areas into consideration during the tender; and
- The installation of concrete pipes and drifts, to facilitate access, must be at the discretion of the ECO and with the approval of DWS. Any dangerous crossings must be marked as such and where necessary, speed limits must be enforced.

#### *B. Pedestrian Routes*

- Pedestrian routes should be wide enough to accommodate the number of people that are likely to use them at peak times;
- Pedestrian routes should be kept free of obstructions; and
- Footpaths should be clearly and suitably signed.

#### *C. Legal*

- Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act 1998 (Act No. 36 of 1998), and therefore may well require the application of a Water Use License. Therefore, the contractor must in consultation with the ECO, assess all areas along the alignment well in advance in order to ensure the relevant areas along the alignment well in advance in order to ensure the proposed works are addressed.

### **Monitoring Responsibility and Frequency**

- The site manager and ECO will undertake general surveillance of access tracks and roads and surrounding areas for damage of access roads and impact on other road users;
- Routes and signage should be inspected daily to allow safe access; and
- Weekly reports to the Health and Safety Officer, including the number of the accidents, fatalities and the causes of the accidents.

**Related Documents/ Sections**

- BIO-001;
- SOC-004;
- CUL-004
- Eskom Soil Erosion Guideline; and
- Eskom Transmission Line Towers and Line Construction.

<b>PHY-006</b>	<b>Waste disposal</b>
<b><u>Legislation</u></b>	
<ul style="list-style-type: none"> <li>▪ National Environmental Management Act (Act No. 107 of 1994);</li> <li>▪ National Environmental Management: Waste Act (Act No. 59 of 2008);</li> <li>▪ National Water Act (No. 36 of 1998) (protection of water resources); and</li> <li>▪ Occupational Health and Safety Act (No 85 of 1993).</li> </ul>	
<b><u>Background</u></b>	
Any construction work generates waste, which can spread through the environment. Waste generation along the servitude will include metal scraps, wooden packing material and wastewater.	
<b><u>Management Objectives</u></b>	
<ul style="list-style-type: none"> <li>▪ To comply with waste management guidelines;</li> <li>▪ To minimise production of waste;</li> <li>▪ To keep the servitude clean and neat;</li> <li>▪ To store and dispose waste in the specified manner; and</li> <li>▪ To minimise Landowner complaints.</li> </ul>	
<b><u>Target</u></b>	
<ul style="list-style-type: none"> <li>▪ The waste system is in place prior to any waste generation works;</li> <li>▪ No waste/ rubble on site;</li> <li>▪ Safe disposal certificates;</li> <li>▪ Labelled bins; and</li> <li>▪ All waste disposed of appropriately.</li> </ul>	
<b><u>Procedures</u></b>	
<p><i>A. Site Offices</i></p> <ul style="list-style-type: none"> <li>▪ The site office and the material storage area must be kept neat, tidy and free of litter.</li> <li>▪ Waste bins covered with tight lids should be supplied by the contractor;</li> <li>▪ No waste shall be burned at the site offices, or anywhere else on the site; and</li> <li>▪ Specific areas shall be designated on-site for the temporary management/storage of various waste streams, i.e. general refuse, construction waste and contaminated waste. The location of these areas should be at least 500m of 'no-go' areas.</li> </ul>	

*B. Solid Waste Disposal*

- The contractor's intended methods for waste management and waste minimisation must be implemented at the outset of the contract, and approved by the ECO;
- All personnel shall be instructed to dispose of all waste in the proper manner;
- Waste collection and disposal pathways and sites will be identified for all major waste types expected from the construction activities.
- At all places of work, the contractor shall provide litter collection facilities for later safe disposal at approved waste disposal sites;
- Solid waste shall be stored in a designated area covered with a tight fitting lid, tip proof metal drums for collection and disposal;
- Signs shall be located on each bin indicating type of bin and what waste may be placed in that bin;
- A bin system shall be established through the use of the separation bins for recyclable materials and non-recyclable waste materials;
- A litter patrol around the construction camp and work areas along the alignment are to take place every day to collect any litter that may have been strewn around;
- The piling of any material that could rot and release unpleasant smells into the air shall not be permitted;
- The contractor shall ensure that no litter is disposed of within quarries or borrow pits or water resources;
- A schedule for waste collection should be established to prevent the containers from over filling. All solid waste shall be disposed of at a registered waste disposal site and a certificate of disposal shall be obtained and kept on file. The disposal of waste shall be in accordance with all relevant legislation. Under no circumstances may solid waste be burnt on site;
- Where a registered waste site is not available close to the construction site, a method statement shall be provided with regards to waste management;
- Any broken insulators shall be removed and all shards picked. Broken, damages and unused nuts, bolts and washers must be picked up and removed from site; and
- Whenever feasible the contractor will reuse and recycle appropriate and viable materials.

*C. Builders rubble*

- The Contractor shall provide labourers to clean up the Contractor's camp and working areas of rubble generated in the course of construction work at least once a week; and
- Clean rubble shall be temporarily stockpiled in a waste skip or a central stockpile/s and may be crushed on site for use as a base course material or removed from site to a crusher plant or licensed landfill site.

*D. Hazardous Waste Disposal*

- Hazardous and non-hazardous waste shall be separated at source. Separate waste collection bins must be provided for this purpose and must be clearly marked and covered with a tight fitting lid;
- Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery should be collected in a holding tank and returned to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, should be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials;
- Oil collected by a mobile servicing unit should be stored in the service unit's sludge tank and

<p>discharged into the safe holding tank for collection by the specialist oil recycling company;</p> <ul style="list-style-type: none"> <li>▪ Non –PCB oils must be disposed of at a registered Class H:H hazardous waste site;</li> <li>▪ Records of quantities disposed, disposal sites, disposal dates, transporters used and safe disposal certificates must be kept and copies submitted to Eskom’s Project Manager; and</li> <li>▪ All oil containment equipment must be labelled indicating its PCB status.</li> </ul> <p><b><u>Please Note</u></b></p> <p><b><i>ALL BINS/TANKS USED FOR THE STORAGE OF SOLID AND HAZARDOUS WASTE SHOULD ALWAYS BE COVERED BY TIGHT FITTING LIDS/CAPS.</i></b></p> <p><b><u>Monitoring Responsibility and Frequency</u></b></p> <ul style="list-style-type: none"> <li>▪ The contractor’s EO should monitor waste pathways to ensure correct application of reuse and recycling;</li> <li>▪ The Contractor EO shall monitor the site daily with respect to compliance with the specifications;</li> <li>▪ The ECO shall monitor minimum weekly that the specifications are complied with and provide the Contractor and Project Manager with an incident reporting system which will be used to report non-conformance to the EMPr;</li> <li>▪ A complaints register will be maintained in which any complaints from the community/ landowners will be logged. Complaints will be investigated and if appropriate acted upon;</li> <li>▪ and</li> <li>▪ The ECO shall provide quarterly periodic summary reports of compliance to the project team.</li> </ul> <p><b><u>Related Section</u></b></p> <ul style="list-style-type: none"> <li>▪ CON-001.</li> </ul>
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<b>PHY-007</b>	<b>Vegetation Clearance</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Conservation of Agricultural Resources Act (Act 43 of 1983) Regulation 15 (removal of weeds/invaders);</li> <li>▪ Limpopo Environmental Management Act (Act No. 7 of 2003);</li> <li>▪ National Environmental Management: Biodiversity Act (No. 10 of 2004);</li> <li>▪ National Forest Act 84 of 1998.</li> <li>▪ Limpopo Conservation Plan version2</li> </ul> <p><b><u>Background</u></b></p> <p>The Project area is characterised of nature reserves which have a moderately high-high ecological sensitivity and according to Limpopo Conservation Plan version 2, the area is classified as CBA1 and CBA2 and associated corridors. Vegetation clearance will also be undertaken at Spencer Substation. There are six species of protected tree species that are found within the demarcated line area, namely tambotie <i>Spirostachys africana</i>, maroela <i>Sclerocarya birrea caffra</i>, Sheppard’s tree <i>Boscia albitrunca</i>, Baobab <i>Adansonia digitata</i>, camel thorn <i>Acacia erioloba</i> and leadwood <i>Combretum imberbe</i>. The clearing of the servitude area can lead to</p>	



- i. shifts in vegetation community, habitat unit structures;
- ii. soil compaction that will modify habitats;
- iii. destroy vegetation and inhibit re-vegetation; and
- iv. vegetation removal and associated habitat destruction would lead to habitat loss for avifauna and fauna.

### **Management Objectives**

- To minimize damage to vegetation;
- To minimise habitat fragmentation and loss of faunal habitat;
- To minimize possibility of erosion due to removal of vegetation;
- To ensure alien plants do not become dominant in the project area and surrounding areas;
- To control alien and invasive species dispersal and encroachment; and
- To promote the natural re-establishment and planting of indigenous species.

### **Targets**

- Tree cutting permit issued for the protected trees that are to be cut down;
- Fenced off areas are intact for the entire duration of construction works;
- On-going monitoring of weed/invasive species management;
- Record of clearing activities; and
- Decline in documented alien abundance over time.

### **Procedures**

#### *A. Vegetation Clearance*

- A tree marking walk down must be carried out in order to quantify the type and quantity of protected trees within the line corridor. Include identification sheets in prominent locations for the protected species (Marula, Shepherd trees and Camel thorn trees);
- No protected trees can be cut or trimmed without a tree cutting permit as per Section `15(1) of the National Forest Act (Act No. 84 of 1998);
- The ECO should identify, locate all plants and natural features to be protected during construction. These plants and features include, but are not limited to, Red Data Species, Protected Plants, Sensitive Communities, Riparian Vegetation, Wetlands, Drainage Lines and Aesthetically Significant Areas;
- Indigenous vegetation, which does not interfere with the safe operation of the power lines, should be left undisturbed. Any intended vegetation clearance must be submitted as a plan of action to the ECO. The ECO should then give the contractor clear guidelines and proper plans with respect to vegetation clearance. Daily inspections are needed to prevent problems;
- The Project Manager and ECO must identify and demarcate the exact clearing of the servitude for the contractor to ensure that minimum de-bushing takes place;
- Disturbance to flora outside of Right of Way (ROW) and access roads should not occur except where the ECO has given permission to do;
- The ECO should be present in an advisory capacity during tree removal;
- Plant demarcations should be maintained in position until the cessation of construction works;
- Construction camps should be located on the outside fringe of the riparian vegetation zone;

- Where possible and without compromising the power lines, all existing large trees that fall outside of the earthworks should be conserved. These will assist in softening the local visual impact and aid in visual screening from distant viewpoints;
- The Contractor will be held liable for the replanting of any plant or feature under the protection of these specifications that is removed or damaged by the Contractor's negligence or mismanagement;
- No open fires are to be permitted under trees;
- Vegetation removed shall be disposed in an appropriate manner to the satisfaction of the ECO and the landowner; and
- Eskom's Vegetation Management Guidelines must be implemented for vegetation clearance.

**PLEASE NOTE:** A Method Statement is required for the removal of indigenous vegetation.

#### **Monitoring Responsibility and Frequency:**

- Control of alien vegetation must be done monthly by the ECO;
- A daily inspection by the contractor's EO to ensure that alien vegetation is not spread to 'no-go' areas;
- Alien plant distribution and clearing measure should be recorded after every three months by the ECO;
- Daily inspections on construction work areas must be undertaken by the contractor's EO; and
- The ECO should record all disturbances to essential habitats and vegetation communities.

#### **Related Documents/ Sections**

- CON-001;
- CON-004;
- BIO-001;
- PHY 001;
- PHY002;
- PHY003;
- Eskom Vegetation Management Guidelines; and
- Guidelines for weed eradication at Eskom substations using herbicides.

<b>PHY-008</b>	<b>Alien Species</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Conservation of Agricultural Resources Act (Act 43 of 1983) Regulation 15 (removal of weeds/invasers);</li> <li>▪ Limpopo Environmental Management Act (Act No. 7 of 2003);</li> <li>▪ National Environmental Management: Biodiversity Act (No. 10 of 2004);</li> <li>▪ National Forest Act 84 of 1998.</li> </ul>	
<p><b><u>Background</u></b></p>	

Table 3 of the Conservation of Agricultural Resources Act (CARA) lists all declared weeds and invader plants. Alien plants are divided into 3 categories based on their risk as an invader.

Category 1 - These plants must be removed and controlled by all land users. They may no longer be planted or propagated and all trade in these species is prohibited.

Category 2 – These plants pose a threat to the environment but nevertheless have commercial value. These species are only allowed to occur in demarcated areas and a land user must obtain a water use licence as these plants consume large quantities of water.

Category 3 – These plants have the potential of becoming invasive but are considered to have ornamental value. Existing plants do not have to be removed but no new plantings may occur and the plants may not be sold.

The alien plants observed on site, *Jacaranda mimosifolia*, *Melia azedarach* and *Psidium guajava*. The alien species were found in disturbed areas; around drainage lines.

### **Management Objectives**

- To ensure alien plants do not become dominant in the project area and surrounding areas;
- To control alien and invasive species dispersal and encroachment; and
- To promote the natural re-establishment and planting of indigenous species.

### **Targets**

- On-going monitoring of weed/invasive species management;
- Records of clearing activities; and
- Decline in documented alien abundance over time.

### **Procedures**

#### *A. Clearing Methods*

- Different species require different clearing methods such as manual, chemical or biological methods or a combination of both.
- Care should be taken that the clearing methods used do not encourage further invasion. As such, regardless of the methods used, disturbance to the soil should be kept to a minimum. Fire is not a natural phenomenon at the site and fires should not be used as a clearing method or vegetation management approach at the site.

#### *B. Herbicide Usage*

- Only registered herbicides shall be used by trained applicators adhering to label specifications. Eskom's standard for herbicide management shall be used as a guideline;
- The use of herbicides shall be in compliance with the terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No 36 of 1947). In terms of this Act, a registered pest control operator shall apply herbicides, or shall supervise the application of herbicides;
- The use of herbicides shall be restricted to the removal and control of alien vegetation, and shall not be permitted within identified sensitive areas;
- Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control;

- All care must be taken to prevent contamination of the water bodies. This includes due care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures; and
- To avoid damage to indigenous or other desirable vegetation, products should be selected that will have the least effect on non-target vegetation.

### *C. Construction Works*

- The ECO is to provide permission prior to any vegetation being cleared for development;
- Cleared areas that have become invaded can be sprayed with appropriate herbicides if these break down on contact with the soil. Residual herbicides should not be used;
- Brush clearing of vegetation is not allowed within 32m of the wetlands;
- Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. Particular attention must be paid to imported material such as building sand or dirty earth-moving equipment;
- Stockpiles should be checked regularly and any weeds emerging from material stockpiles should be removed;
- Alien vegetation re-growth must be controlled throughout the entire site during the construction period; and
- Clearing activities must be contained within the affected zones and may not spill over into demarcated No Go areas.

**PLEASE NOTE:** A Method Statement is required for the removal of alien vegetation.

### **Monitoring Responsibilities and Frequency**

- Alien species on site should be recorded during pre-construction;
- Control of alien vegetation must be done ECO monthly;
- A daily inspection by the contractor's EO to ensure that alien vegetation is not spread to 'no-go' areas;
- Alien plant distribution and clearing measure should be recorded after every three months;
- Daily inspections on construction work areas;
- The ECO should record all disturbances to essential habitats and vegetation communities.

### **Related Documents/ Sections**

- CON-001;
- CON-004;
- BIO-001;
- PHY 001;
- PHY002;
- PHY003;
- Eskom Vegetation Management Guidelines; and
- Eskom Guidelines for weed eradication at Eskom substations using herbicides.

PHY-009	Open Space Management
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Animal Protection Act (Act No. 71 of 1962);</li> <li>▪ Conservation of Agricultural Act (Act No. 43 of 1983);</li> <li>▪ Fencing Act (Act No.31 of 1963);</li> <li>▪ Hazardous Substances Act (Act No. 15 of 1973);</li> <li>▪ National Environmental Management Act (Act No. 107 of 1998);</li> <li>▪ National Environment Management: Air Quality Act (Act No. 39 of 2004)</li> <li>▪ National Environmental Management: Waste Act (Act No. 59 of 2008)</li> <li>▪ National Heritage Resources Act (Act No. 25 of 1999)</li> <li>▪ National Veld and Forest Act (Act No. 101 of 1998);</li> <li>▪ National Water Act (Act No. 36 of 1998)</li> </ul>	
<p><b><u>Background</u></b></p> <p>“Open Space” consists of areas of an undeveloped character where development is restricted or that are set aside for natural or cultural resource protection and dispersed recreation. Included are undeveloped natural lands with trails, cultural and historic sites, significant habitat supporting ecosystem health, wildlife habitat, areas managed for community wildfire protection, riparian areas, and significant viewsheds. The project area is generally characterised into three land categories:</p> <ol style="list-style-type: none"> <li>a. Natural areas: These areas have high aesthetic values and comprise of hills and low mountains which are relatively undisturbed. The vegetation in these areas is in a fair to good condition with high plant diversity. Designated routes will be established to permit good access in these areas;</li> <li>b. Transformed areas: These areas are located adjacent to built up areas and roads. These areas have been significantly impacted by human activities. Controls should be established in these areas; and</li> <li>c. Agricultural areas.</li> </ol>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To focus on preserving and restoring native ecosystems;</li> <li>▪ To protect and promote natural biodiversity; and</li> <li>▪ To provide a balance between works and the capacity of nature.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ Fenced off areas are intact for the entire duration of construction works;</li> <li>▪ On-going monitoring of weed/invasive species management;</li> <li>▪ Record of clearing activities; and</li> <li>▪ Decline in documented alien abundance over time.</li> </ul>	
<p><b><u>Procedures</u></b></p> <p>To achieve the goal of a healthy ecosystem, open spaces within the project area will be managed. This will be done by:</p> <ul style="list-style-type: none"> <li>▪ Preventing uncontrolled fires that may result in destruction of the ecosystem including human lives and property;</li> <li>▪ Maintain or enhance visual resource values;</li> </ul>	

- Restrict the introduction of non-native species. Parts of the project area are characterised of Invasive Alien Species (IAS). There is need to prevent their spread into and domination of open space; and

- Protect known and unknown artefacts.

*A. Resource Protection And Preservation*

- No motorised vehicular traffic is allowed in areas without access tracks or roads;
- Plants and other natural features are not to be disturbed or removed unless authorised by the ECO;
- Disposing, burying or burning of trash in open space is prohibited;
- Trapping animals is prohibited; and
- Natural vegetation communities shall be maintained. Planting native species shall be encouraged during rehabilitation to restore damaged areas.

*B. Protected Habitat Areas*

- Vegetation control measures associated with invasive species control or fire prevention will be closely monitored to ensure damage to these habitats is minimised;
- Fencing or other forms of demarcation shall be used to divert employees away from sensitive areas.

**Monitoring Responsibility and Frequency**

- Control of alien vegetation must be done monthly by the ECO;
- A daily inspection by the contractor's EO to ensure that alien vegetation is not spread to 'no-go' areas;
- Daily inspections on construction work areas; and
- The ECO should record all disturbances to essential habitats and vegetation communities.

**Related Sections**

- PHY-007
- PHY-008

<b>PHY-010</b>	<b>Gate Installation and gate control</b>
<b><u>Legislation</u></b>	
<ul style="list-style-type: none"> <li>▪ Fencing Act (Act No 31 of 1963)</li> </ul>	
<b><u>Background</u></b>	
Gates are installed where it is necessary to breach existing fence lines. This is required to help with the access of roads that are utilized for operational and maintenance purpose of the power line.	
<b><u>Management Objectives</u></b>	
<ul style="list-style-type: none"> <li>▪ Installation of gates according to Eskom's specifications;</li> <li>▪ Minimise damage to fences; and</li> <li>▪ Limit access to Eskom and Contractor personnel with gate keys.</li> </ul>	
<b><u>Target</u></b>	

- No transgressions of the fencing act and therefore no litigation;
- No damage to fences and subsequent complaints from landowners;
- All gates equipped with locks and kept locked at all times to limit access;
- All fences properly tied off to the gate posts;
- All gates properly and neatly installed according to specifications; and
- No complaints about open gates.

#### **Procedures**

- The ECO, Eskom and the landowner should negotiate and agree about the installation and use of access gates. All agreements reached should be documented and no verbal agreements should be made;
- All gates shall be fitted with locks and be kept locked at all times during the construction phase. Gates shall only be left open on request of the landowner if he accepts responsibility for such gates in writing;
- All claims arising from gates left open shall be investigated and settled in full by the Contractor;
- Where no gates exist, gate installation shall be according to Eskom's standards and the following shall apply:
  - i. Game gates shall be installed where necessary. All gates installed in electrified fencing shall be electrified as well;
  - ii. If any fencing interferes with the construction process, such fencing shall be deviated until construction is completed; and
  - iii. The ECO must establish with game farm owners/ nature reserves what height in accordance with the landowners "Certificate of Adequate Enclosure" game farm gates must be. This will be communicated to the contractor, and Eskom must supply the relevant drawings.

#### **Monitoring Responsibility and Frequency**

- The Contractor's EO to check gates after entering and leaving the site and document with photos.

#### **Related Document**

- Eskom Transmission servitude gates standard guidelines.

<b>PHY-011</b>	<b>Fire Prevention</b>
<b><u>Legislation</u></b>	
<ul style="list-style-type: none"> <li>▪ The Forest Act, (Act No. 122 of 1984);</li> <li>▪ Veld and Forest Fire Act (Act No. 101 of 1998).</li> </ul>	
<b><u>Background</u></b>	
Stored flammables and combustible materials brought to site, plant operating on site and informal open fires made by staff outside of designated locations could give rise to uncontrolled fires.	

<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ Minimise risk of veld fires; and</li> <li>▪ Minimise damage to grazing land.</li> <li>▪ Minimise loss of fauna.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ A fire management plan is in place before construction;</li> <li>▪ No veld fires started by the Contractor's work force;</li> <li>▪ No claims from landowners for damages due to veld fires; and</li> <li>▪ No litigation.</li> </ul>	
<p><b><u>Procedures</u></b></p> <ul style="list-style-type: none"> <li>• Fire breaks must be constructed on the inside perimeter of the construction camp to prevent fires from spreading from the site as well as fires entering the site from adjacent land; and</li> <li>• A fire management plan should be developed in conjunction with the Ba-Phalaborwa, Greater Letaba, Greater Tzaneen and Maruleng Local Municipalities as well as an emergency management plan. This plan should commence prior to construction and maintained throughout the operational phase. The following additional measures must be included: <ul style="list-style-type: none"> <li>❑ No fires may be made for the burning of vegetation and waste;</li> <li>❑ No open fires are to be made on site; cooking facilities must be provided;</li> <li>❑ No firewood may be collected;</li> <li>❑ Fire fighting equipment must be readily available on site during all times; and</li> <li>❑ Burning of waste material such as vegetation and old cleaning materials resulting from maintenance activities at the site is strictly prohibited.</li> </ul> </li> </ul>	
<p><b><u>Monitoring Responsibility and Frequency</u></b></p> <ul style="list-style-type: none"> <li>▪ The Contractor's Environmental Officer shall ensure that all inductions and training is carried out to facilitate fire response and evacuation and shall ensure that all fire- fighting equipment is available and inspection registers are up to date;</li> <li>▪ The ECO shall monitor minimum weekly that no unauthorised fires are being made and of undue fire risks observed and provide the Contractor and Project Manager with an inspection report of any specifications not adequately complied with and how to rectify this; and</li> <li>▪ The ECO shall provide quarterly reports of compliance to the project team.</li> </ul>	
<p><b><u>Related Document</u></b></p> <ul style="list-style-type: none"> <li>▪ Eskom Fire Management Guideline.</li> </ul>	

<b>PHY-012</b>	<b>Tower Positions</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Animal Protection Act (Act No. 71 of 1962);</li> <li>▪ Conservation of Agricultural Act (Act No. 43 of 1983);</li> </ul>	



- Fencing Act (Act No.31 of 1963);
- National Environmental Management Act (Act No. 107 of 1998);
- National Environment Management: Air Quality Act (Act No. 39 of 2004)
- National Heritage Resources Act (Act No. 25 of 1999)
- National Veld and Forest Act (Act No. 101 of 1998);
- National Water Act (Act No. 36 of 1998)

### **Management Objectives**

- Minimise damage to topsoil and environment at tower positions;
- Successful rehabilitation of all damaged areas; and
- Prevention of erosion.

### **Target**

- No loss of topsoil due to construction activities;
- All disturbed areas successfully rehabilitated within six months of completion of the contract; and
- No visible erosion scars six months after completion of the contract.

### **Procedures**

- Disturbance of topsoil on tower sites with severe slopes shall be minimised at all costs;
- At any tower sites where conventional foundations are installed, the Contractor shall remove the topsoil separately and store it for later use during rehabilitation of such tower sites;
- The location and method for stockpiling of any material must be in consultation with the ECO to ensure material is not stockpiled in drainage lines, the quality and make up of stockpiled material is not compromised, etc;
- During backfilling operations, the Contractor shall take care not to dump the topsoil in the bottom of the foundation and then put spoil on top of that;
- Other methods of rehabilitation of tower sites may also be used at the discretion of the Environmental Control Officer, e.g. stone pitching, logging, etc;
- Contour banks shall be spaced according to the slope on tower sites. The type of soil shall also be taken into consideration;
- Trenches for tower foundations shall be demarcated with a fence prior to backfilling;
- Re-seeding, as well as fencing in of badly damaged areas, will always be at the discretion of the Environmental Control Officer, unless specifically requested by a landowner; and
- The proposed new power line is at some points located in very close proximity to an existing power line hence it is strongly recommended that where it is practically feasible, the contractor must minimize vegetation clearance and rather utilize the already cleared spaces for tower assembling.

### **Monitoring Responsibility and Frequency**

- On-going monitoring of areas with soil susceptible to erosion by ECO to ensure that formation of gullies is avoided;
- On-going monitoring of erosion and sediment control measures by ECO to determine their effectiveness;

- Daily visual inspection of sediment control devices done by contractor's EO; and
- Remove spoiled soils and other materials.

**Related Documents**

- Eskom Transmission Line Towers and Line Construction Guideline.

<b>PHY-013</b>	<b>Batching Plant</b>
<b><u>Legislation</u></b>	
<ul style="list-style-type: none"> <li>▪ National Water Act 1998, Section 3(3), 77, 22(2)c;</li> <li>▪ National Environmental Management: Air Quality Act (No. 39 of 2004).</li> </ul>	
<b><u>Management Objectives</u></b>	
<ul style="list-style-type: none"> <li>▪ To ensure all agreements with landowners are adhered to;</li> <li>▪ Prevention of complaints from landowners;</li> <li>▪ Minimise pollution of air, soil, surface and ground water resources;</li> <li>▪ Successful rehabilitation of disturbed areas; and</li> <li>▪ Compliance with the National Water Act 1998.</li> </ul>	
<b><u>Targets</u></b>	
<ul style="list-style-type: none"> <li>▪ No complaints from landowners; and</li> <li>▪ Successful implementation of rehabilitation measures for all disturbed areas.</li> </ul>	
<b><u>Procedures</u></b>	
<ul style="list-style-type: none"> <li>▪ The batching plant area shall be operated in such a way as to prevent contaminated water runoff from the site and polluting nearby streams or water bodies. To this effect diversion berm can be installed to direct all wastewater to a catchment area;</li> <li>▪ On completion of the project, these berms must be suitably repaired and the affected areas suitably rehabilitated in consultation with the ECO. Further, the following must be adhered to by the contractor;</li> <li>▪ No concrete is to be mixed within the 1:50 year flood line;</li> <li>▪ Concrete must be contained to the batching area with every effort made in consultation with the ECO to ensure exposed soil is not contaminated by cement mixing activities;</li> <li>▪ After all concrete mixing is complete; all waste concrete shall be removed from the batching area and disposed of as instructed by the ECO;</li> <li>▪ Storm water shall not be allowed to flow through the batching area. Cement sediment shall be removed from time to time and disposed of in a manner as instructed by the ECO;</li> <li>▪ Should water be required from sources other than Eskom supply, a written agreement shall be reached between the ECO and the landowner in the presence of Eskom. Should the Contractor be required to use water from a natural source, the ECO shall ensure that a Water Use Licence is in place before abstraction;</li> <li>▪ Strict control shall be maintained and the ECO shall ensure that the abstraction point is metered and that abstraction methods are documented; and</li> </ul>	

- Eskom shall ensure that all agreements reached with the landowner are fulfilled, and that such areas be rehabilitated once construction is completed. Should any claim be instituted against Eskom, due to the actions of the Contractor at a batching plant site, Eskom shall hold the Contractor fully responsible for the claim until such time that the Contractor can prove otherwise with the necessary documentation.
- **PLEASE NOTE:** A Method Statement is required.

#### **Monitoring Responsibility and Frequency**

- The Contractor shall monitor the site daily with respect to compliance with the specifications;
- The ECO shall monitor minimum weekly that the specifications are complied with and provide the Contractor and Project Manager with an inspection report of any specifications not adequately complied with and how to rectify this; and
- The ECO shall provide quarterly reports of compliance to the project team and DEA.

<b>PHY-014</b>	<b>Stringing Operations and Diverters</b>
<b><u>Legislation</u></b>	
<ul style="list-style-type: none"> <li>▪ Conservation of Agricultural Resources Act (Act 43 of 1983) Regulation 15</li> <li>▪ National Environmental Management Act (Act No. 107 of 1998);</li> <li>▪ National Veld and Forest Act (Act No. 101 of 1998);</li> <li>▪ National Water Act (Act No. 36 of 1998)</li> </ul>	
<b><u>Management Objectives</u></b>	
<ul style="list-style-type: none"> <li>▪ Prevent damage to expensive structures and crops; and</li> <li>▪ Prevent disruption of services.</li> </ul>	
<b><u>Targets</u></b>	
<ul style="list-style-type: none"> <li>▪ No claims emanating from damage to supporting structures and crops; and</li> <li>▪ No complaints or claims arising from disruption of services.</li> </ul>	
<b><u>Procedures</u></b>	
<ul style="list-style-type: none"> <li>▪ The necessary scaffolding must be installed to prevent damage to structures supporting perennial crops;</li> <li>▪ All structures supplying services such as telephone and smaller power lines, as well as farm roads, shall be safeguarded by measures to prevent disruption of services;</li> <li>▪ The approved footprint must be monitored for the stringing storage areas;</li> <li>▪ Construction machinery required for stringing and bird diverters installation must utilise existing servitude cleared during the tower construction process; and</li> <li>▪ Where the centre line servitude has not been cleared, the ECO must be consulted to ensure sensitive areas such as rocky outcrops, wetland areas, ridges, critical biodiversity areas etc. are not impacted on negatively.</li> </ul>	
<b><u>Monitoring Responsibility and Frequency</u></b>	
<ul style="list-style-type: none"> <li>▪ The site manager and ECO should undertake general inspection of infrastructure to check for damage.</li> </ul>	

**Related Section**

- CON-004.

<b>PHY-015</b>	<b>Site Clean-Up and Rehabilitation</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Conservation of Agricultural Resources Act (Act 43 of 1983) Regulation 15</li> <li>▪ National Environmental Management Act (Act No. 107 of 1998);</li> <li>▪ National Veld and Forest Act (Act No. 101 of 1998);</li> <li>▪ National Water Act (Act No. 36 of 1998);</li> <li>▪ Fertilizers, Farm Feed and Remedies Act, (Act No. 36 of 1947)</li> <li>▪ Animal Protection Act (Act No. 71 of 1962);</li> <li>▪ Hazardous Substances Act (Act No. 15 of 1973);</li> <li>▪ National Environment Management: Air Quality Act (Act No. 39 of 2004)</li> <li>▪ National Environmental Management: Waste Act (Act No. 59 of 2008)</li> <li>▪ Occupational Health and Safety Act (Act No. 85 of 1993) - Hazardous Substances Regulations</li> </ul>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ Establishment of vegetation in areas previously disturbed by construction where feasible to stabilise the site and improve aesthetics;</li> <li>▪ Stabilisation of soils;</li> <li>▪ Control of alien invasive plant species;</li> <li>▪ To ensure and encourage site rehabilitation of disturbed areas; and</li> <li>▪ To ensure that the site is appropriately rehabilitated following the execution of the works, such that residual environmental impacts are remediated or curtailed.</li> </ul>	
<p><b><u>Targets</u></b></p> <ul style="list-style-type: none"> <li>▪ Monitoring of all construction areas including construction equipment camps and working areas, cleared of equipment and temporary facilities;</li> <li>▪ Topsoil replaced on all areas and stabilised;</li> <li>▪ Disturbed areas rehabilitated and acceptable plant cover achieved on rehabilitated areas; and</li> <li>▪ Closed site free of erosion and alien invasive plants.</li> </ul>	
<p><b><u>Procedures</u></b></p> <ul style="list-style-type: none"> <li>▪ The Contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project. Pre-construction imagery can be taken to determine the loss of natural landscape and later compared to the rehabilitated land to obtain an indication of overall success in re-vegetation and rehabilitation;</li> <li>▪ Compacted areas that are no longer needed post-construction (e.g. laydown areas and the crane) shall be ripped and scarified;</li> <li>▪ Necessary drainage works and anti-erosion measures shall be installed, where required, to minimise</li> </ul>	

loss of topsoil and control erosion;

- The contractor should replace stockpiled topsoil in disturbed areas where rehabilitation is to be undertaken as a layer of at least 10cm in thickness; and
- The ECO should ensure that the contractor implements immediate surface restoration and re-sloping in order to prevent erosion, taking cognisance of local contours and landscaping.

**Monitoring Responsibility and Frequency**

- The Project Manager shall monitor all rehabilitation areas to ensure that they are establishing well and are free from alien invasive vegetation.
- The ECO is to comment on the progress and success of re-vegetation efforts.

**Related Sections**

- PHY-008;
- PHY-011;
- SOC-003;
- BIO-001;
- BIO-002;
- BIO-003

## 3.2.4 SOCIAL ISSUES AND THEIR CONTROL

SOC-001	Sanitation
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ National Environmental Management: Waste Act No. 59 of 2008;</li> <li>▪ Occupational Health and Safety Act No. 85 of 1993.</li> </ul>	
<p><b><u>Background</u></b></p> <p>There is need to provide adequate sanitation for workers on-site.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ Ensure that proper sanitation is achieved by encouraging all employees to use provided toilets;</li> <li>▪ Minimise the potential of diseases on site; and</li> <li>▪ Reduce the potential to pollute water, natural habitats and soil.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ No complaints received from landowners regarding sanitation;</li> <li>▪ No reports of health issues to local inhabitants and their livestock as a result of poor sanitation;</li> <li>▪ No evidence of contaminated waste water entering an unapproved soak-away area; and</li> <li>▪ No contamination of soils, surface and ground water resources from poor sanitation.</li> </ul>	
<p><b><u>Procedures</u></b></p> <ul style="list-style-type: none"> <li>▪ Ensure that adequate numbers of conveniently located site toilets are available on all work sites at all times in quantities related to the number of users; 1 chemical toilet per 15 users and 1 flush toilet per 30 users;</li> <li>▪ Do not locate any site toilet, sanitary convenience, within the 1:100 year flood line, or within a horizontal distance of 100m of a watercourse, drainage line or wetland;</li> <li>▪ Maintain and clean site toilets regularly as is required to keep them in good, functional working order and in an acceptable state of hygiene;</li> <li>▪ All chemical toilets must have a suitable locking mechanism;</li> <li>▪ Staff shall be sensitised to the fact that they should use these toilets at all times;</li> <li>▪ Care must be taken to ensure waste is not spilled on site. The contractor must provide the ECO with proof of maintenance contracts and schedules;</li> <li>▪ Strategies must be implemented to ensure that toilet paper is always available to the workforce;</li> <li>▪ 'Sealed' plastic septic systems may be utilised at crew camps in consultation with the ECO. The ECO shall ensure the location and installation mitigates against any contamination of soils and surface or ground water resources; and</li> <li>▪ The contractor must provide the ECO with proof of 'honey sucker' maintenance contracts and schedules.</li> </ul>	
<p><b><u>Monitoring Responsibility and Frequency</u></b></p> <ul style="list-style-type: none"> <li>▪ The Health and Safety Representative should monitor the sanitation systems on site daily.</li> </ul>	
<p><b><u>Related Section</u></b></p> <ul style="list-style-type: none"> <li>▪ CON-001.</li> </ul>	

<b>SOC-002</b>	<b>Health and Safety</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Occupational Health and Safety Act No. 85 of 1993.</li> </ul>	
<p><b><u>Background</u></b></p> <ul style="list-style-type: none"> <li>▪ Where sourcing of local labour is not possible, "outsiders" will need to be employed in order to provide necessary skills. These employees may be accommodated in a construction camps. Historically, such camps create social impacts by introducing new people to an area.</li> <li>▪ Health of construction workers may also be at risk if appropriate clothing or equipment are not used for specific activities.</li> <li>▪ Construction activities will result in increased traffic in the area, particularly from heavy vehicles, as well as disruptions to traffic flow along affected roads. This increase in traffic together with construction activities such as open trenches will lead to an increase in safety risks for local residents, motorists and passengers.</li> </ul>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To promote good health;</li> <li>▪ To ensure security of workers and community; and</li> <li>▪ To prevent litigation due to infection of livestock/game due to unsanitary conditions.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ No complaints from landowners;</li> <li>▪ No litigation;</li> <li>▪ No crimes recorded; and</li> <li>▪ Good health.</li> </ul>	
<p><b><u>Procedures</u></b></p> <ul style="list-style-type: none"> <li>▪ The workforce should be transported to and from the site to discourage loitering in adjacent areas and possible increase in crime or disturbance;</li> <li>▪ The Contractor shall take all the necessary precautions against the spreading of disease, especially under livestock and game;</li> <li>▪ The workforce shall also be sensitized to the effects of sexually transmitted diseases, especially AIDS;</li> <li>• The specifications included under this section do not exempt the Contractor from complying with all the Regulations as included in the Occupational Health and Safety Act (Act 85 Of 1993). The contractor is further referred to this Act and all its regulations;</li> <li>• The safety of all construction and operational personnel, as well as any member of the public on the site is the responsibility of the Contractor;</li> <li>• Access onto and off the site should be controlled by means of a register system. This includes visitors;</li> </ul>	

- The contractor and Health and Safety Officer (HSO) should ensure that first aid / emergency facilities / procedures are in place;
- The HSO should ensure that all personnel are trained in basic site safety procedures;
- A register with contact numbers of all people employed and one relative for each should be kept on site;
- A list of all relevant emergency numbers should be kept in an easily accessible location on site;
- A record of all incidents, accidents and illnesses on site shall be kept and the information shall be made available at meetings;
- The HSO should ensure that proper footwear is worn by employees at all times;
- The site manager shall ensure that employees are issued with and make use of the necessary safety equipment when working in dusty, noisy and / or dangerous situations. Such equipment may include, but is not necessarily limited to hardhats, goggles, masks, earplugs, gloves, safety footwear and safety ropes as required;
- The site manager shall ensure that adequate drinking water, wash water and sanitary facilities are available at all times and on all work sites;
- The site manager shall provide a designated place for food storage, preparation and consumption on site. This should be a shaded area;
- The site manager shall ensure that personnel are transported legally, and in a safe and responsible manner;
- The site manager shall ensure that all vehicle and machine operators are qualified and licensed to operate their vehicles / machines;
- Dangerous excavations or works that may pose a hazard to humans and animals must be protected. These areas must be demarcated with hazard tape or fencing as required and the appropriate danger signs must be posted;
- The contractor/ site manager must respect workers' right to refuse to work in unsafe conditions;
- Ensure that strict safety measures are employed around open trenches and excavations;
- Implement regulated traffic safety procedures; and
- Minimise extent of roadside disruptions on adjoining roads where possible in order to allow for normal traffic flow.

#### **Monitoring Responsibility and Frequency**

- The Contractor's H&S officer shall monitor the site regularly with respect to compliance with the specifications. This shall be verified by the Contractor's external H&S Agent's monthly report.
- The ECO shall report to the Contractor's H&S Officer any safety concerns that were observed during his/her site inspections.

#### **Related Section**

- SOC-001



<b>SOC-003</b>	<b>Noise</b>
<b><u>Legislation</u></b>	
<ul style="list-style-type: none"> <li>▪ SANS 10103.</li> </ul>	
<b><u>Management Objectives</u></b>	
<ul style="list-style-type: none"> <li>▪ To minimize the generation of noise from construction activities.</li> </ul>	
<b><u>Target</u></b>	
<ul style="list-style-type: none"> <li>▪ No complaints received from the public.</li> </ul>	
<b><u>Procedures</u></b>	
<p><i>A. Working Hours</i></p> <ul style="list-style-type: none"> <li>▪ The contractor must inform adjacent residents of any unusually noisy activities that will be undertaken during the construction phase;</li> <li>▪ Working hours must be restricted between 06:00a.m to 18:00p.m on Mondays to Sundays;</li> <li>▪ No construction activities will be allowed at night; and</li> <li>▪ All noise generated during construction must comply with the relevant SANS codes and standards.</li> </ul> <p><i>B. Plant and Equipment</i></p> <ul style="list-style-type: none"> <li>▪ All machinery, including earthmoving vehicles should be regularly maintained to reduce noise intensity;</li> <li>▪ Installation of sound vibration detectors on plant machinery is recommended;</li> <li>▪ Construction vehicles must use designated entry and exit routes so that noise impacts can be largely confined to specific access routes; and</li> <li>▪ The contractor should ensure that construction workers use earplugs.</li> </ul>	
<b><u>Monitoring Responsibility and Frequency</u></b>	
<ul style="list-style-type: none"> <li>▪ Routine inspections of plant and equipment must be carried out by the Health and Safety Officer and EO; and</li> <li>▪ Any noise complaints received from the public should be recorded, reported and monitored.</li> </ul>	
<b><u>Related Section</u></b>	
<ul style="list-style-type: none"> <li>▪ SOC-006</li> </ul>	

<b>SOC-004</b>	<b>Landowner's/Stakeholder Concerns</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Constitution of the Republic of South Africa</li> </ul>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To ensure adequate regard has been taken of concerns of affected and surrounding landowners and that these are appropriately addressed;</li> <li>▪ To minimise complaints from landowners;</li> <li>▪ To prevent litigation due to outstanding claims; and</li> <li>▪ Successful completion of the contract and all landowners signing release forms.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ No complaints received regarding construction activities from property owners</li> <li>▪ All complaints and issues received are timeously attended to and addressed; and</li> <li>▪ All landowners signing release forms within six months after completion of the contract.</li> </ul>	
<p><b><u>Procedures</u></b></p> <ul style="list-style-type: none"> <li>▪ Where required, relocation and decommissioning of dwellings may only take place once negotiations and compensations have been finalised by Eskom;</li> <li>▪ The success of the project depends a lot on the good relations with the landowners. It is therefore required that the Liaison Officer (LLO) be the only liaison between the contractor and landowners;</li> <li>▪ The ECO shall be available to investigate all problems arising on the work sites concerning the landowners;</li> <li>▪ All negotiations for any reason shall be between Eskom, the landowner and the ECO. NO verbal agreements shall be made. All agreements shall be recorded properly and all parties shall co-sign the documentation. It is proposed that the Contractor and ECO keep a photographic record of access roads before the commencement of construction activities. This will then be available should any claims be instituted by any landowners. Any claims instituted by the landowners shall be investigated and treated promptly. Unnecessary delays should be avoided at all costs;</li> <li>▪ The landowners shall always be kept informed about any changes to the construction programme should they be involved. The contact numbers of the Eskom ECO shall be made available to the landowners. This will ensure open channels of communication and prompt response to queries and claims; and</li> <li>▪ All contact with the landowners shall be courteous at all times. The rights of the landowners shall be respected at all times and all staff shall be sensitised to the effect that they are working on private property. Eskom Project Manager and Liaison Officer must establish formal contact with the landowners. Such landowners must be provided with the contact numbers of relevant project and site management staff, with whom any complaint, concern or issue can be lodged for immediate attention.</li> <li>▪ All landowners to sign access agreements with Eskom. ECO and Contractor to be present to ascertain special conditions;</li> </ul>	

- Eskom personnel and the contractor(s) team should not access private properties without prior notification of the property owners;
- Eskom should coordinate with landowners in terms of access and construction activities in order to minimise disturbance; and
- A register shall be kept of all complaints from landowners. All claims shall be handled immediately to ensure timely rectification / payment.

#### **Monitoring Responsibility and Frequency**

- An incident reporting system must be used to record non-conformances to the EMPr.

#### **Related Documents / Section**

- CON-001;
- PHY-010;
- Bio-001.

<b>SOC-005</b>	<b>Air Quality</b>
<b><u>Legislation</u></b>	
<ul style="list-style-type: none"> <li>▪ Atmospheric Pollution, Prevention Act (Act No. 45 of 1965);</li> <li>▪ National Environmental Management: Air Quality Act (Act No. 39 of 2004).</li> </ul>	
<b><u>Management Objectives</u></b>	
<ul style="list-style-type: none"> <li>▪ To minimize the generation of dust on the project site; and</li> <li>▪ To minimize all potential odour issues relating to contaminated soil and water.</li> </ul>	
<b><u>Targets</u></b>	
<ul style="list-style-type: none"> <li>▪ No visible dust within the project site;</li> <li>▪ No visible loose material from trucks; and</li> <li>▪ No complaints from the public.</li> </ul>	
<b><u>Procedures</u></b>	
<p><i>A. Wind Barriers</i></p> <ul style="list-style-type: none"> <li>▪ Wind barriers should be placed perpendicular to the direction of the prevailing wind;</li> <li>▪ Porous barriers should be used as they provide smaller reductions in velocity for more extended distances;</li> <li>▪ Wind barriers to be used should be at least 2 metres high; and</li> <li>▪ The screening material should have a porosity of 50% or less.</li> </ul> <p><i>B. Dust Control</i></p> <ul style="list-style-type: none"> <li>▪ Exposed surfaces should be kept moist by spraying with water and dust suppressant;</li> <li>▪ Exposed surfaces and stockpiles left for long should be stabilised by sealing, seeding or spraying with water or dust suppressant; and</li> <li>▪ Combustible waste material shall not be burnt on site.</li> </ul>	

<p><i>C. Earth moving Management</i></p> <ul style="list-style-type: none"> <li>▪ Do not commence or continue with earth moving activities in adverse weather conditions;</li> <li>▪ Use balanced cut and fill operations to reduce off-site hauling;</li> <li>▪ All vehicles shall not exceed the maximum speed limit of 40km/h within the site;</li> <li>▪ Trucks transporting loose material to and from the site should be covered;</li> <li>▪ Excessive idling of construction vehicles at sites is prohibited; and</li> <li>▪ Vehicles should be well serviced to avoid excessive emissions.</li> </ul> <p><i>D. Stockpiles</i></p> <ul style="list-style-type: none"> <li>▪ Stockpiles should be covered, however where they are located in open areas the height and slope should be limited to reduce wind pick up;</li> <li>▪ Stockpiles should be oriented lengthwise into the wind so they offer the minimum cross sectional area to prevailing winds;</li> <li>▪ Wind barriers should be installed on three sides of the stockpile;</li> <li>▪ Activity should be limited to the downside of the stockpile; and</li> <li>▪ Transfer points should be minimized.</li> </ul> <p><i>E. Watering</i></p> <ul style="list-style-type: none"> <li>▪ The surface should be dampened to prevent dust from becoming airborne but should not be wet to the extent of producing run-off;</li> <li>▪ Use watering sprays on materials to be loaded and during loading; and</li> <li>▪ Real time automated response systems should be used to turn on water cannon systems in response to dust levels or high wind speeds.</li> </ul>	
<p><b><u>Monitoring Responsibility and Frequency</u></b></p> <ul style="list-style-type: none"> <li>▪ The Project Manager and ECO should carry out a weekly inspection during site preparation;</li> <li>▪ Daily inspection by the Contractor EO and ECO to monitor activities for dust generation and moisture content of exposed areas;</li> <li>▪ Continuous monitoring by the ECO and the Contractor EO with regards to fires caused by burning of waste; and</li> <li>▪ Pre-construction inspection and maintenance as required for construction vehicles.</li> </ul>	
<p><b><u>Related Section</u></b></p> <ul style="list-style-type: none"> <li>▪ SOC-006</li> </ul>	

<b>SOC-006</b>	<b>Traffic Management Plan</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ National Roads Act</li> </ul>	
<p>This section aims to address hazards associated with construction vehicles and public vehicles, pedestrians and infrastructure and the processes undertaken to eliminate or reduce the risks associated with these interactions. Construction traffic movements may include deliveries of materials, supplies and equipment on site, haulage of earthwork materials and regular traffic movements by construction personnel.</p>	

**Management Objectives**

- To address traffic issues arising from construction of the power lines;
- To reduce the number of accidents between construction vehicles and the public.

**Target**

- A decrease or zero number of accidents recorded;
- Minimal disturbance of normal traffic flow; and
- A low record of complaints received.

**Procedures**

Once the camp site area has been identified, the contractor in consultation with the ECO, Health and Safety Officer and the site engineer will set routes:

- That all site deliveries will be directed along to gain access to site;
- That all construction vehicles will use when leaving the site camp; and
- Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards
- Traffic management system and staff training should be implemented, especially for site access and near-site heavy traffic;
- The contractor should ensure provision of safe passages and crossings for pedestrians where construction traffic interferes.
- Working hours should be adjusted to local traffic patterns, e.g. avoiding major transport activities during times of livestock movement
- Active traffic management by trained and visible staff at the site, if required for safe and convenient passage for the public.

*A. Vehicles*

- Pre-operational safety checks must be conducted for vehicles and equipment operating on site;
- Only personnel licensed and authorized to operate designated equipment must use the equipment;
- Employees and construction workers driving and operating vehicles must do so in a safe manner;
- Employees operating equipment/vehicles shall not use alcohol and other drugs when operating equipment;
- Vehicles must comply with all speed limits of 40km/h;
- Designated routes must always be used when operating equipment;
- Traffic signs and directional markings must be adhered to at all times;
- Mounting/dismounting a moving vehicle is prohibited;
- Vehicles must always be parked in designated parking areas;
- Contractor must provide employees with a vehicle that meets the appropriate safety standards; and
- Any safety related matters concerning the operating vehicles must be reported immediately.

*B. Pedestrian Routes*

- Pedestrian routes should be wide enough to accommodate the number of people that are likely

<p>to use them at peak times;</p> <ul style="list-style-type: none"> <li>▪ Pedestrian routes should be kept free of obstructions;</li> <li>▪ Footpaths should be clearly and suitably signed.</li> </ul>
<p><b>Monitoring Responsibility and Frequency</b></p> <ul style="list-style-type: none"> <li>• The site manager and ECO will undertake general surveillance of access tracks and roads and surrounding areas for damage of access roads and impact on other road users;</li> <li>• Routes and signage should be inspected daily to allow safe access; and</li> <li>• Weekly reports to the Healthy and Safety Officer, including the number of the accidents, fatalities and the causes of the accidents.</li> </ul>

<b>SOC-007</b>	<b>Tourism and Nature Reserves</b>
<p><b>Legislation</b></p> <ul style="list-style-type: none"> <li>▪ The Tourism Act No. 3 of 2014;</li> <li>▪ The National Tourism Sector Strategy (NTSS);</li> <li>▪ The Tourism Bill 2012</li> </ul>	
<p>The first section of the power line from Foskor substation to Groot-Letaba is characterised of nature reserves where eco-tourism is taking place. There is need to ensure that little or no visual intrusion occurs due to the placement of towers and construction camps.</p>	
<p><b>Management Objectives</b></p> <ul style="list-style-type: none"> <li>▪ To minimise the negative impact on tourism and nature reserves;</li> <li>▪ To ensure good house-keeping throughout the site;</li> <li>▪ To minimise habitat fragmentation of the nature resources;</li> <li>▪ To minimise the negative visual impact.</li> </ul>	
<p><b>Target</b></p> <ul style="list-style-type: none"> <li>▪ Good house-keeping</li> <li>▪ No clearing outside the demarcated footprint;</li> <li>▪ Emergency Management Plan</li> </ul>	
<p><b>Procedures</b></p> <ul style="list-style-type: none"> <li>▪ Eskom should ensure that construction does not contradict with the hunting season. There should also be communication between Eskom and game reserves owners in relation to working hours during construction phase so as to avoid disturbing animal feeding times, and curb poaching concerns raised during public participation meetings;</li> <li>▪ Eskom must screen construction activity to reduce the impact on tourism, and utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and laydown yards out of the view of sensitivity visual receptors;</li> <li>▪ Keep disturbed areas to a minimum;</li> <li>▪ No clearing of land to take place outside the demarcated footprints;</li> </ul>	

- The contractor should maintain good housekeeping on site to avoid litter and minimise waste;
- Construction activities should be done via helicopter where possible to avoid any damage to the sensitive vegetation, but should not be used in areas where sensitive game species could be disturbed by the noise;
- Contractors should be supervised at all times while working in these areas, utilization of bulldozers should be minimized, access routes should be minimized;
- Eskom should develop an emergency management plan to specifically deal with the increased risk of fires; and
- The contractor should submit a method statement for accessing private land and the conduct of these workers within the farms.

**Monitoring Responsibility and Frequency**

- Daily inspections by the ECO on construction work areas when clearing vegetation inside nature reserves.
- Regular inspections by the ECO and contractor's EO to monitor if illegal activities occur.

**Related Documents/ Sections**

- CON-001;
- BIO-001; and
- PRE-002.

## 3.2.5 BIOLOGICAL ISSUES AND THEIR CONTROL

<b>BIO-001</b>	<b>Flora and fauna</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Conservation of Agricultural Resources Act (Act No. 43 of 1983) Regulation 15 (removal of weeds/invasers);</li> <li>▪ National Environmental Management: Biodiversity Act (Act No. 10 of 2004); and</li> <li>▪ National Forest Act (Act No. 84 of 1998).</li> </ul>	
<p><b><u>Background</u></b></p> <p>The Project Development, in close proximity to Foskor MTS is characterised of formal and informal nature reserves classified as moderately high-high ecological sensitivity and classified as critical biodiversity areas. Protected tree species were observed and the reserves are habitats for different fauna (large and small mammals) and avi-fauna.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ Minimal disturbance to vegetation where such vegetation does not interfere with construction and operation of the line;</li> <li>▪ Prevention of litigation concerning removal of vegetation;</li> <li>▪ Minimise disturbance of animals; and</li> <li>▪ Minimise interruption of breeding patterns of birds.</li> </ul>	
<p><b><u>Targets</u></b></p> <ul style="list-style-type: none"> <li>▪ No stock losses where construction is underway ;</li> <li>▪ No complaints from landowners or Nature Conservation Organisations; and</li> <li>▪ No litigation concerning stock losses and animal deaths.</li> </ul>	
<p><b><u>Procedures</u></b></p> <p><i>A. Flora</i></p> <ul style="list-style-type: none"> <li>▪ Areas of high ecological sensitivity should be demarcated as 'no-go' areas;</li> <li>▪ Existing roads should be used where possible;</li> <li>▪ Limited plants need to be removed when clearing the servitude for the new power line;</li> <li>▪ Exposed areas should be rehabilitated with a grass mix that blends in with surrounding vegetation. The grass mix should consist of indigenous grasses adapted to the local environmental conditions;</li> <li>▪ The power line should be designed to avoid fragmentation of the environmentally sensitive areas.</li> <li>▪ All recognized natural habitats, wetlands and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities;</li> <li>▪ A survey and an inventory shall be made of large trees in the vicinity of the construction activity, large trees shall be marked and cordoned off with fencing, their root system protected, and any damage to the trees avoided;</li> <li>▪ The ECO must on a regular basis conduct scans for protected, endangered species and medicinal plants that may occur along the line route;</li> <li>▪ A walk down survey consisting of the surveyor, the engineer and botanist must be undertaken to see if it will be necessary to move pylons to lower the need of trimming or cutting of protected</li> </ul>	



trees. Contractors must exercise special care not to damage or remove any such species unless necessary. Permits for removal must be obtained from the Department of Agriculture, Forestry and Fisheries (DAFF);

- All plants not interfering with the operation of the line shall be left undisturbed;
- Collection of firewood is strictly prohibited;
- Eskom must according to the National Forest Act, apply for removal permits for all protected trees found within the servitude;
- A tree marking walk down must be carried out in order to quantify the type and quantity of protected trees within the line corridor. DAFF will also require that Eskom complete an offset for the trees cut;
- The ECO should be present in an advisory capacity during tree removal;
- Limited plants need to be removed when clearing the servitude for the new power line. Clear guidelines and proper plans must be given to the contractor and inspections should be cleared out daily during the clearing activities;
- Where areas are going to be disturbed through the destruction of vegetation, for example the establishment of the construction camp, the vegetation occurring in the area to be disturbed must be salvaged and kept in a controlled environment such as a nursery, for future re-planting in the disturbed areas as a measure of rehabilitation;
- Provide prior notice to land-owners about operation and maintenance work being carried out in their areas.
- Regular maintenance, inspections and removal of alien plants should be undertaken;
- Firewood is not to be removed from the line corridor
- *Melia azedarach* and *Psidium guajava* invasive species were observed within the area. To avoid and minimise the establishment and increase in alien species in riparian zones, indigenous vegetation should be trimmed and not removed;
- The servitude must be only cleared from larger vegetation that will impact directly to the conductors. This entails that trimming of larger trees must be done and it is important that “no total clearing of the basal layer” must be allowed. This will ensure that the grass and small shrub layer will lower the risk of erosion and the establishment of alien invasive plants in the corridor; and
- A formal induction and monitoring of clearing must be done by the botanist to ensure that the permit regulations are carried out.

#### B. Fauna

- The Contractor shall under no circumstances interfere with livestock or game without the ECO and landowner being present. This includes the moving of livestock and or game where they interfere with construction activities;
- Alien vegetation should be removed from all sites on a regular basis;
- An alien vegetation monitoring and control plan should be compiled and implemented during the operational phase of the project;
- Regular monitoring of the construction process, especially in identified sensitive habitats should be carried out by the ECO all through the construction phase;
- Low trees, shrubs and ground vegetation should be left to grow back which will provide cover for most wildlife that need to move through the Right of Way;
- Eskom and the contractor should establish a “Zero Tolerance” approach to poaching;

- The contractor's EO should carry out regular awareness raising of existing laws, rules and penalties against poaching;
- Strict monitoring of construction and maintenance crew activities by the ECO;
- No workers stay on site and must be limited to the construction site as far as possible.
- The breeding sites of raptors and other wild bird species shall be taken into consideration during the planning of the construction programme;
- Liaise with the landowners about the game present on the different farms. Where dangerous animals are present, it will be important to ensure that game is moved to other camps where possible;
- Construction activities must not coincide with mating;
- Activities must be carried out in appropriate months so as to avoid potential claims from landowners;
- The ECO and contractor's EO should ensure that there is minimum interference with wildlife and domestic animals.
- Where possible, a ranger from the farm must be present during construction to ensure the safety of man and animals. A concern will be the areas where *Loxodonta africana* and *Giraffa camelopardalis* are present as the former can damage pylons and get electrocuted if conductors are too low and the latter is exposed to electrocution as well.

#### C. *Avi-fauna*

- A qualified avifaunal specialist must identify high-risk sections of power line during the walk-through phase of the project, once the alignment has been finalized.
- Construction activity should be restricted to the immediate footprint of the infrastructure.
- Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species.
- Measures to control noise should be applied according to current best practice in the industry.
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
- It is imperative that the breeding sites of birds are kept intact and that the breeding pairs are not disturbed especially where there are young nestlings. The Contractor shall take all the necessary precautions;
- Should any new sites or nests be found, during the construction process, that was not known or have been noted before, each site shall be assessed for merit and the necessary precautions be taken to ensure the least disturbance;
- Where power line marking is required (i.e. in areas that contain rivers, dams or is situated near a vulture restaurant), bird flight diverters must be installed on the full span length on each earthwire (according to Eskom guidelines - five metres apart). Light and dark colour devices must be alternated to provide contrast against both dark and light backgrounds respectively. These devices must be installed as soon as the conductors are strung. The earth wire should be marked by Bird Flight Diverters.; and
- The avifaunal specialist must inspect the final powerline alignment on foot prior to construction to ascertain if any Red Data species nests are present. All relevant detail must be recorded i.e. species, coordinates and nest status. Should any nests be recorded, it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist and the Environmental

<p>Control Officer. An effective communication strategy should be implemented whereby the avifaunal specialist is provided with a construction schedule, which will enable him/her to ascertain when and where such breeding Red Data species could be impacted by the construction activities. This could then be addressed through the timing of construction activities during critical periods of the breeding cycle, once it has been established that a particular nest is active.</p> <ul style="list-style-type: none"> <li>▪ The recommendations of the avian specialist shall be adhered to at all time to prevent unnecessary disruption of such species.</li> <li>▪ The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.</li> </ul>
<p><b><u>Monitoring Responsibility and Frequency</u></b></p> <ul style="list-style-type: none"> <li>▪ Daily inspections by the ECO on construction work areas when clearing vegetation.</li> <li>▪ Regular inspections by the ECO and contractor's EO to monitor if illegal activities occur.</li> </ul>
<p><b><u>Related Documents/Sections</u></b></p> <ul style="list-style-type: none"> <li>▪ CON-001;</li> <li>▪ CON-004;</li> <li>▪ BIO-001;</li> <li>▪ PHY- 001;</li> <li>▪ PHY-002;</li> <li>▪ PHY-003;</li> <li>▪ PHY-007;</li> <li>▪ Eskom Vegetation Management Guidelines;</li> <li>▪ Eskom Standard for bush clearance and the maintenance of overhead power line route.</li> </ul>

<b>BIO-002</b>	<b>Herbicide Use</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Conservation of Agricultural Resources Act No. 43 of 1983;</li> <li>▪ Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No 36 of 1947).</li> </ul>	
<p><b><u>Background</u></b></p> <p>Herbicides are used during rehabilitation and operation phase to eradicate weeds.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ Control over the use of herbicides.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ No signs of vegetation dying due to leaching of herbicides one year after completion of the bush clearing; and</li> <li>▪ No landowner complaints.</li> </ul>	
<p><b><u>Procedure</u></b></p>	

- Registered Pest Control Officers adhering to label specifications shall use registered herbicides. Eskom's standard for herbicide management, shall be used as a guideline;
- The use of herbicides shall be in compliance with the terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No 36 of 1947). In terms of this Act, a registered pest control operator shall apply herbicides, or shall supervise the application of herbicides;
- The use of herbicides shall be restricted to the removal and control of alien vegetation, and shall not be permitted within identified sensitive areas;
- Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control;
- All care must be taken to prevent contamination of the water bodies. This includes due care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures;
- Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of in a suitable site; and
- To avoid damage to indigenous or other desirable vegetation, products should be selected that will have the least effect on non-target vegetation.

#### **Monitoring Responsibility and Frequency**

- Routine testing of soil and water within the project area by the ECO.

#### **Related Documents/ Sections**

- CON-001;
- CON-004;
- BIO-001;
- PHY- 001;
- PHY-002;
- PHY-003;
- PHY-007;
- BIO-001;
- Eskom Vegetation Management Guidelines;
- Eskom Standard for bush clearance and the maintenance of over- head power line route.

<b>BIO-003</b>	<b>Re-Vegetation and Rehabilitation</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Conservation of Agricultural Resources Act (Act 43 of 1983) Regulation 15 (removal of weeds/invaders);</li> <li>▪ Limpopo Environmental Management Act (Act No. 7 of 2003);</li> <li>▪ National Environmental Management: Biodiversity Act (No. 10 of 2004);</li> <li>▪ National Forest Act 84 of 1998.</li> </ul>	
<p><b><u>Background</u></b></p> <p>Due to the vulnerability of the Tzaneen Sour Bushveld and the vegetation within the first section of the power line (from Foskop-Groot Letaba), a plant rescue and relocation plan is developed. The re-vegetation and habitat rehabilitation plan indicates the procedures to be implemented for site restoration and re-vegetation. It outlines the appropriate site-specific methods to ensure that impacts on vegetation within the project's temporary work areas are minimized or avoided and that those areas affected by the construction activities are restored post-construction.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To promote the survival and abundance of red data species and plant taxa of concern;</li> <li>▪ To identify, remove and potentially relocate red data species and plant taxa of ecological concern from the proposed construction site.</li> <li>▪ To allow for the maximum transplant of conservation important species from areas to be transformed.</li> </ul>	
<p><b><u>Target</u></b></p> <p>Weekly and monthly progress reports by the ECO that include:</p> <ul style="list-style-type: none"> <li>▪ Estimated species coverage and diversity;</li> <li>▪ Species health;</li> <li>▪ Establishment of native species; and</li> <li>▪ The existence of weeds.</li> </ul>	
<p><b><u>Procedures</u></b></p> <ul style="list-style-type: none"> <li>▪ Follow up searches should be done to ensure that progress can be made based on the diversity of important plant taxa species that are found;</li> <li>▪ During the final walk through, the ecologist should identify important taxa and physically mark such species in the field.</li> <li>▪ A database of all captured reference points of important plant taxa for easy of location and transplantation should be compiled; and</li> <li>▪ All the important taxa as mentioned in the plant and rescue plan should be removed and relocated to a site where they can be utilized for rehabilitation.</li> </ul> <p><i>A. Plant Rescue, Removal And Transplantation</i></p> <ul style="list-style-type: none"> <li>▪ The size of the plant rescue workforce must be determined based on the number of important taxa that can be removed;</li> <li>▪ Only conservation worthy plants need to be rescued as time constraints, budget and other</li> </ul>	

limiting factors hinder the success of removal of all plant taxa. Therefore only plant taxa that are considered worthy of conservation need be considered;

- Follow-up surveys of important plant taxa need to be done within a short period of time before the initial clearing of the land is made as the construction phase commences;
- Where plants are too large or root structure too deep to be successfully removed, the seeds of such species can be collected and later sown in a plant transplantation site;
- Plant transplantation must be done immediately after the construction phase of the project is over;
- Important plant taxa that have been removed should be either transplanted to areas nearby, or grown in an off-site nursery to be replanted during re-vegetation and habitat rehabilitation of the project area;
- Vegetation clearing must be restricted to the footprint of the construction site only, i.e., Right of Way (ROW).

#### *B. Re-Vegetation And Habitat Rehabilitation*

- The seeds collected before the construction phase can also be replanted directly on site after the construction and during the operational phase of the substation and power line when the re-vegetation and habitat rehabilitation plan is being implemented;
- Potential threats such as fires and alien plant invasion should be monitored to provide the ideal conditions of survival for important plant taxa that has been reintroduced in the site;
- Pre-construction imagery can be taken to determine the loss of natural landscape and later compared to the rehabilitated land to obtain an indication of overall success in re-vegetation and rehabilitation;
- The survival rate of transplanted and translocated flora (especially important taxa flora) can give an indication to the overall success of the re-vegetation and rehabilitation and provide important data to better future approaches;
- Permanent stabilization, i.e., re-vegetation will be done immediately after construction and no later than 14 days post construction.

#### *C. Permit Application*

- All plant taxa of concern is protected by provincial and national legislation and ordinance and therefore a permit from the relevant authority needs to be obtained before any plant species can be removed or transplanted:
- Plants which need to be transplanted that are individual trees which are protected in terms of the National Forest Act, Act 30 of 1998, need to be under a permit system and an application must be submitted to the Department of Water Affairs;
- Plants which need to be transplanted that are listed as threatened or protected species under the National Environmental Management Act: Biodiversity Act, Act 10 of 2004, need to be under a permit system and an application must be submitted to the relevant authority; and
- All required permits must be obtained from the relevant authority. Permits may be numerous and

fit different aspects of the re-vegetation and habitat rehabilitation plan such as removal, handling, transportation and replanting.

- The plants should be removed by hand while young. Seedlings should not be allowed to grow to a size where they have reached seed bearing age or requiring expensive mechanical or chemical controls.
- Single isolated seedlings should be uprooted and suspended from a fork in a tree, or placed onto a rock or concrete surface, where they will be unable to set roots again.
- Care must be taken that no part of the plant is left lying where it can root.
- Under no circumstances must pieces of the plant simply be carted away to be discarded since this is one of the common ways in which cactus infestations originate.

**PLEASE NOTE:** A Method Statement is required.

#### **Monitoring Responsibility and Frequency**

- For the first three months post-construction, all re-vegetated areas will be inspected by the ECO weekly for failure until a dense cover of vegetation has been established; and
- After the three months, monitoring will be conducted on a monthly basis for the first year and will be reduced to a quarterly schedule.

#### **Related Documents/ Sections**

- PHY-008;
- PHY-009;
- BIO-001;
- BIO-002.

## 3.2.6 Cultural issues AND THEIR CONTROL

CUL-001	Archaeological and Heritage Objects
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ The National Heritage Resources Act No. 25 of 1999;</li> <li>▪ Limpopo Provincial Heritage Regulations No. 103 of 2003.</li> </ul>	
<p><b><u>Background</u></b></p> <p>Development traverses across the residential areas and previously occupied areas and excavations may damage cultural-historical and archaeological artefacts.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ Protection of archaeological sites and land considered to be of cultural value;</li> <li>▪ Protection of known sites against vandalism, destruction and theft;</li> <li>▪ The preservation and appropriate management of new archaeological finds should these be discovered during construction; and</li> <li>▪ Protection of sites and land considered to be of cultural value.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ No destruction of or damage to known archaeological sites;</li> <li>▪ No litigation due to destruction of sites; and</li> <li>▪ Management of existing sites and new discoveries in accordance with the recommendations of the Archaeologist.</li> </ul>	
<p><b><u>Procedure</u></b></p> <ul style="list-style-type: none"> <li>▪ Familiarise all staff and contractors with procedures for dealing with heritage objects/sites;</li> <li>▪ Care should be taken to conserve exposed archaeological objects in gullies;</li> <li>▪ Any graves shall be clearly marked and treated as no go areas. Marked and unmarked graves were observed at the following co-ordinates; <ul style="list-style-type: none"> <li><b>23.48158°S, 30.42467°E;</b></li> <li><b>23.49391°S, 30.41997°E; and</b></li> <li><b>23.60836°S, 30.49391°E</b></li> </ul> </li> <li>▪ No destruction of any site shall be allowed. Should it be necessary to remove any graves, the necessary procedures shall be followed and permits obtained;</li> <li>▪ Artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. The permit must be obtained from the SAHRA Burial Ground and Graves (BGG) Unit.) in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) and Limpopo Provincial Heritage Regulations No. 103 of 2003;</li> <li>▪ If the building is a designated historic structure, very close to such a structure, or located in a designated historic area, notification shall be made and approvals/permits be obtained from SAHRA and all construction activities planned and carried out in line with local and national legislation;</li> <li>▪ It shall be ensured that provisions are put in place so that artifacts or other possible "chance finds" encountered in excavation or construction are noted and Eskom's, responsible officials</li> </ul>	



<p>contacted, and works activities delayed or modified to account for such finds;</p> <ul style="list-style-type: none"> <li>▪ The Chance Palaeontological Finds procedure must be implemented by the ECO; and</li> <li>▪ A heritage practitioner should complete a “walk down” of the final selected power line servitudes, and all other activity areas (access roads, construction camps, etc.) prior to the start of any construction activities. This walk down will document all sites, features and objects, in order to propose adjustments to the routes and thereby to avoid as many impacts to heritage as possible. The report must be submitted to SAHRA for commenting prior to construction, and no construction may occur without comments from SAHRA.</li> </ul>
<p><b><u>Monitoring Responsibility and Frequency</u></b></p> <ul style="list-style-type: none"> <li>▪ Visual monitoring by the site manager, the ECO and the archaeologist during excavation activities.</li> </ul>
<p><b><u>Related Section</u></b></p> <ul style="list-style-type: none"> <li>▪ CON-001.</li> </ul>

<b>CUL-002</b>	<b>Infrastructure</b>
<p><b><u>Legislation</u></b></p> <ul style="list-style-type: none"> <li>▪ Infrastructure Development Act (Act 23 of 2014)</li> </ul>	
<p><b><u>Background</u></b></p> <p>Excavation and erection of structures may destroy or damage telephone lines, reticulation power lines and bulk water supply infrastructure located within the project area.</p>	
<p><b><u>Management Objectives</u></b></p> <ul style="list-style-type: none"> <li>▪ To control activities in close proximity to private property and servitudes; and</li> <li>▪ To minimize damage to existing access roads; and minimize damage to environment due to construction of new access roads.</li> </ul>	
<p><b><u>Target</u></b></p> <ul style="list-style-type: none"> <li>▪ Number of incidences reported; and</li> <li>▪ No complaints received from the public.</li> </ul>	
<p><b><u>Procedure</u></b></p> <ul style="list-style-type: none"> <li>▪ No telephone lines shall be dropped during the stringing operations;</li> <li>▪ Where pipe lines 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. Any damage to pipe lines shall be repaired immediately;</li> <li>▪ 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;</li> <li>▪ Speed limits shall be enforced in such areas and all drivers shall be sensitised to this effect;</li> <li>▪ Power cuts to facilitate construction and especially stringing must be carefully planned. If possible disruptions must be kept to a minimum and should be well advertised and communicated to the residents; and</li> <li>▪ Where the lines cross any inhabited area, the necessary precautions shall be taken by the Contractor to safeguard the lives and property of the inhabitants. The Contractor shall under no</li> </ul>	

circumstances interfere with the property of landowners.
<p><b>Monitoring Responsibility and Frequency</b></p> <ul style="list-style-type: none"> <li>▪ The site manager and ECO should undertake on-going general inspection of infrastructure to check for damage on infrastructure.</li> </ul>
<p><b>Related Section</b></p> <ul style="list-style-type: none"> <li>▪ CON-001.</li> </ul>

### 3.2.7 OPERATION

<b>OPER-001</b>	<b>Operation</b>
<p><b>Legislation</b></p> <ul style="list-style-type: none"> <li>▪ Animal Protection Act (Act No. 71 of 1962);</li> <li>▪ Conservation of Agricultural Act (Act No. 43 of 1983);</li> <li>▪ Fencing Act (Act No.31 of 1963);</li> <li>▪ Hazardous Substances Act (Act No. 15 of 1973);</li> <li>▪ National Environmental Management Act (Act No. 107 of 1998);</li> <li>▪ National Environment Management: Air Quality Act (Act No. 39 of 2004)</li> <li>▪ National Environmental Management: Waste Act (Act No. 59 of 2008)</li> <li>▪ National Heritage Resources Act (Act No. 25 of 1999)</li> <li>▪ National Veld and Forest Act (Act No. 101 of 1998);</li> <li>▪ National Water Act (Act No. 36 of 1998)</li> <li>▪ Occupational Health and Safety Act (Act No. 85 of 1993) - Hazardous Substances Regulations</li> </ul>	
<p><b>Background Management Objectives</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Periodic removal of exotic species from the power line servitude;</li> <li><input type="checkbox"/> To prevent erosion of access roads;</li> <li><input type="checkbox"/> To prevent bird electrocutions and subsequent power line faults;</li> <li><input type="checkbox"/> To maintain a low grass cover along access roads and around tower positions;</li> <li><input type="checkbox"/> To ensure that all fires are under control;</li> <li><input type="checkbox"/> To prevent destruction of these sites;</li> <li><input type="checkbox"/> To limit the impact on agricultural activities;</li> <li><input type="checkbox"/> To maintain good relations with the landowners; and</li> <li><input type="checkbox"/> An activity that results in the least visual impact on all receptors.</li> </ul>	
<p><b>Target</b></p> <ul style="list-style-type: none"> <li>▪ No exotic species noted along the power line servitude;</li> <li>▪ Access roads neat and clean of vegetation;</li> </ul>	

- Excess bare soil not visible adjacent to access roads;
- Excess vegetation removal not visible in areas adjacent to access roads;
- Few to no instances of wildlife mortality noted;
- Servitude length is suitably rehabilitated and that erosion is not a concern;
- No waste materials noted in the areas in which hardware rehabilitation has been undertaken;
- No negative feedback is received from landowners;
- No encroachment on power line servitude;
- No encroachment into agricultural crops;
- No negative feedback from landowners;
- No damage to archaeological sites reported;
- No run-away fires reported;
- No loss of agricultural crops, game, homesteads or life;
- Well maintained activity that has little or no impact on the environment; and
- All actions to be measured against the Operational Phase Environmental Management Plan.

### **Procedure**

#### *A. Maintenance*

- Only exotic species should be removed to avoid unnecessary disturbance to the environment;
- Access roads should be maintained on a periodic basis;
- Implement erosion protection (e.g. control of stormwater runoff) in areas where erosion is noted;
- Grass should be cut only when necessary and must be disposed in an environmentally friendly way; and
- Gates should be closed upon entry unless they are open prior to approaching.

#### *B. Rehabilitation*

- All disturbed areas should be rehabilitated;
- Vegetative cover should be natural and sufficient to eliminate erosion potential;
- Eskom should ensure that they remain within the authorised servitude at all times; and
- All waste material from site following rehabilitation should be removed from the site.

#### *C. Alien Vegetation*

- Surveys for alien species should be conducted regularly;
- All aliens identified should be cleared.
- Re-vegetation with indigenous, locally occurring species should take place in areas where natural vegetation is slow to recover or where repeated invasion has taken place.

- Areas of natural vegetation that need to be maintained or managed to reduce plant height or biomass, should be controlled using methods that leave the soil protected, such as using a weed-eater to mow above the soil level.
- No alien species should be cultivated on-site. If vegetation is required for aesthetic purposes, then non-invasive, water-wise locally occurring species should be used.

*D. Landowner Interaction*

- Landowners should be informed each time access to their farms is required; and
- Contact details of the responsible Eskom representative should be provided to the landowners.

*E. Agricultural And Game Activities*

- Good relations with landowners should be maintained;
- Farmers should be consulted prior to any crop clearing activities and when entering the game areas; and
- Ensure that all gates are closed upon entering game enclosed areas.

*F. Fire Fighting*

- When required, fire breaks must be implemented around all sensitive structures/crops; and
- Fire-fighting equipment to be at hand during burns

*G. Archaeological Objects*

- Mark these sites clearly and make Eskom technicians/staff aware of their location, characteristics and significance.

*H. Visual*

- Maintain the general appearance of the installation as a whole;
- Monitor land surface in the vicinity of the substation, access roads and towers to prevent loss of vegetation and first signs of desertification; and
- Maintain access roads to prevent scouring and erosion especially after rains.

*I. Loss Of Wetland Habitat And Ecological Structure*

- Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the construction of the power lines;
- No dumping of waste material should be allowed; and
- Wetland systems and their buffer zones should be regarded as no-go areas during the project life-cycle.

*J. Soil Erosion*

- Reduce clearing to a minimum to maintain vegetation cover;
- Low level water deflection berms should be constructed to minimise soil erosion;
- Run-off should be controlled before it develops into an erosive force;
- A channel for runoff should be created to avoid numerous runoff channels that erode the soil; and

- Re-vegetate cleared soil after construction, for the control of soil erosion and water capacity.

#### **Monitoring Responsibility and Frequency**

- All rehabilitation and maintenance should be monitored by grid staff and landowners when undertaking maintenance operations;
- Landowner to report any contraventions to Eskom during the entire operation duration;
- Fire-breaks and encroachments to be regularly inspected during the entire duration of the operation phase;
- Eskom staff and land-owners to regularly inspect and check archaeological objects;
- ECO to undertake monitoring functions for 1 year after construction has been completed to measure compliance and effectiveness of mitigation measures. Management thereafter to be undertaken by the responsible entity.

#### **Related Documents/ Sections**

- CON-004;
- PHY- 007;
- SOC-001;
- BIO-001;
- Eskom Transmission Vegetation Management Guidelines;
- Eskom Standard for bush clearance and the maintenance of over- head power line route;
- Eskom Oil spill clean-up; and
- Eskom Transmission Line Towers and Line Construction.

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### 3.2.8 DECOMMISSIONING AND CLOSURE

This development has a long timeframe and may be decommissioned after 40years.

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#### 3.2.8.1 ENVIRONMENTAL IMPACTS

- Any deconstruction work generates solid waste, which can spread through the environment. Solid waste generation at the substations will include metal scraps, wooden packing material. Main liquid waste is the oil waste, transformer oil and sewerage;
- Oil or fuel leakages from maintenance vehicles will contaminate soils;
- Habitat fragmentation and disturbance of fauna;
- Displacement of Red Data species may occur during the decommissioning phase of the power line and may be caused by the noise and movement associated with the dismantling activities.
- Destruction of existing cropland; and

- Servitude clearing would increase soil erosion by surface run-off.

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#### 3.2.8.2 *MITIGATION MEASURES*

- Decommissioning activity should be restricted to the immediate footprint of the infrastructure;
- Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species;
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum;
- The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as rehabilitation of disturbed areas is concerned;
- Existing roads and paths should be used for access;
- Upon completion of each pylon one should ensure that site is left clean and free from (debris, hydrocarbons and waste. Moreover, all excavations should be filled appropriately;
- Re-vegetate cleared soil after construction with local and indigenous grass species, for the control of soil erosion and water capacity; and
- All the measures that have been stated in previous Sections shall be used.

## 4. CONCLUSION

Should these recommended measures be adopted in the planning, construction, operation/ maintenance and decommissioning phases of the proposed activity, DIGES finds that the predicted impacts of the proposed activities are within acceptable limits.

It should be noted however, that environmental management is dynamic and as such the EMPr must be flexible in order to accommodate changing circumstances and requirements. Ongoing environmental monitoring of the power line and substation should be carried out throughout its life cycle, and such should be conducted by a dedicated Environmental Control Officer, to identify and address new issues as they arise, and to update or amend the management plan accordingly.

## 5. REFERENCES

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## **APPENDIX A: EAP'S CV**

# CURRICULUM VITAE

## PERSONAL DETAILS

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**Name** : Brenda Makanza  
**Year of birth** : 1981  
**Mobile** : +27820756685  
**Email** : brendam@diges.co.za

## PROFILE & OBJECTIVES

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- High personal integrity, and able to relate to and create trust in all.
- Possess first-class analytical, design and problem-solving skills. Dedicated to maintaining high quality standards. Able to work on own initiative and as part of a team.
- Persistent and flexible approach to the mutually beneficial achievement of business plans and personal goals of staff and customers.

## PROFESSIONAL QUALIFICATIONS

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**Honours Degree:** Environmental Science (**NUST, Zimbabwe**)

**Post Graduate Certificate:** Integral Water Management (**Saxion University, The Netherlands**)  
Introduction to Geo-informatics (**University of Johannesburg, South Africa**)  
Professional Diploma GIScience- (**UNIGIS, 2014-2015**)

## COMPUTER LITERACY

### Software type

ArcGIS 9.3 & 10.1  
QGIS  
Landserf  
Microsoft Office

### Use

Analysis and Map Production  
Analysis and Map Production  
Analysis and Map Production  
Reporting

### Membership

- WISA
- GISSA
- SACNASP

## WORK EXPERIENCE

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### ***Skills and Experience***

- Environmental Impact Assessments;
- Groundwater Quality Analysis;
- Geographic Information Systems;
- Natural Resources Management;
- Environmental Monitoring & Audits.
- Great communication ability on all levels.

1. **Company:** **DIGES GROUP**  
**Position:** Senior Environmental Scientist

**Country:** South Africa  
**Period:** 2009-present

### Roles:

- To carry out the assessment of Environmental Statements, including interpretation of technical reports and appendices which may comprise part or all of the ES;

- Study the environmental impacts developments on soil, groundwater, rivers, lakes, wildlife habitats, and all sorts of ecosystems;
- Site surveys, as well as anticipating future ecological developments;
- To ensure that the EIA register is maintained and kept up-to-date;
- To prepare and give evidence at public inquiries, as required;
- To prepare and present reports to the relevant stakeholders; and
- To comply with relevant legislation, policies and stakeholder department instructions and resolutions;

### **Projects worked on include**

#### **Borrow Pits**

- Borrow Pit Application for Upgrading of gravel road from Praktiseer to Taung village within Greater Tubatse Local Municipality.
- Borrow Pit Application for road upgrading from Lebowakgomo to Tooseng village
- Borrow Pit Application for road upgrading from Polokwane to Matlala village within Aganang local Municipality Capricon District, Limpopo Province (18 months).

#### **Bridges**

- Basic Assessment for the proposed construction of an access bridge at Tidintitsane village within Greater Tubatse Local Municipality, Sekhukhune District, Limpopo
- Basic Assessment and EMP for the proposed construction of an access bridge at Mareseleng village within Greater Tubatse Local Municipality, Sekhukhune District, Limpopo
- 24G Application for the construction of an access bridge at Manyaka village within Greater Tubatse Local Municipality, Sekhukhune District, Limpopo
- 24G Application for the construction of an access bridge at Tutakgomo village within Greater Tubatse Local Municipality, Sekhukhune District, Limpopo

#### **Bulkwater Supply Pipelines**

- Basic Assessment and EMP for the proposed construction of 7km bulkwater supply pipeline from Mavambe village to Malamulele CBD within Thulamela Local Municipality, Vhembe District, Limpopo Province;
- Basic Assessment and EMP for the proposed construction of 15km bulkwater supply pipeline from Maandagshoek to Diphale village within Greater Tubatse Local Municipality, Vhembe District, Limpopo Province

#### **Cemeteries**

- Basic Assessment, EMP, Geotechnical survey and Geohydrological survey for the proposed establishment of a cemetery in Seshego within Polokwane Local Municipality of Capricon District, Limpopo Province

#### **Demarcations**

- Demarcation of 100 stands at Mtititi Plange within Thulamela Local Municipality of Vhembe District
- Demarcation of 100 stands at Mtititi Lombard within Thulamela Local Municipality of Vhembe District
- EMP and Basic Assessment Report of Mahatlani village within Makhado Local , Vhembe District, Limpopo (Demarcation of Residential Stands).
- EMP and Basic Assessment Report of Ga-matshubeng village within Greater Tubatse local Municipality, Sekhukhune District, Limpopo Province (Demarcation of Residential Stands).
- EMP and scoping report and EIA for the proposed township establishment at Praktiseer within Greater Tubatse Local Municipality (demarcation of stands).

- EMP and Basic Assessment Report of Malokela village within Greater Tubatse Local Municipality, Sekhukhune District, Limpopo Province (Demarcation of Residential Stands).
- EMP and Basic Assessment Report of Mulodi village within Mutale Local Municipality, Vhembe District, Limpopo (Demarcation of Residential Stands).

### **Power Lines**

- Proposed construction of a 132kV power line from PPRUST substation to the proposed Akanani substation within Mogalakwena Local Municipality.
- Proposed construction of a 45 km 132kV power line from Jane Furse substation to the proposed Mamatsekele substation within Makhuduthamaga Local Municipality , Greater Sekhukhune District, Limpopo Province
- Proposed construction of a 30 km 132kV power line from Amandla substation within Elias Motsoaledi Local Municipality, Greater Sekhukhune District to Kwaggafontein substation within Thembisile Hani Local Municipality, Nkangala District.

### **Roads**

- Environmental Management Plan for the maintenance of P1/6 road within Polokwane Local Municipality.
- EMP and Basic Assessment Report for Upgrading of gravel road from Praktiseer to Taung village within Greater Tubatse Local Municipality.
- Environmental monitoring for road upgrading from Lebowakgomo to Tooseng village (18 months).
- Environmental monitoring for road upgrading from Polokwane to Matlala village within Aganang local Municipality Capricon District, Limpopo Province (18 months).
- Environmental monitoring for road maintenance from Hoedspruit (R527) to Kamperus (R531) within Maruleng Local Municipality of Mopani District.

### **Other Responsibilities**

- Project Management;
- Contract administration and billing of clients;
- Liaison with clients/local authorities/professionals/contractors.

2. **Company:** Ministry of Environment & Natural Resources Management      **Country:** Zimbabwe  
**Position:** Southern Africa Biodiversity Support Programmes' Assistant      **Period:** 2005 - 2008

### **Role**

- Packaging and disseminating targeted biodiversity materials to stakeholders;
- Liaising with the Programme Management Unit (PMU) in Gaborone and host institutions on regional databases for up to date information on Programme outputs;
- Working closely with Convention Biological Diversity National Focal Point and National Programme Coordinator to ensure that national Clearing House Mechanisms (CHMs) access information on biodiversity related documents and outputs;
- Convening meetings of the National Biodiversity Forum, expert working groups and other key stakeholders on specific biodiversity topics;
- Documenting specific activities undertaken by National Biodiversity Task Forces and Expert Working Groups and their outcomes;
- Conducting a stock take of relevant biodiversity initiatives/projects underway in the country and the SADC region; and

- Assist the National Programme Co-ordinator in raising awareness on the Programme at different national fora.

### **Other Responsibilities**

- Development of Biodiversity proposals for funding;
- Liaison with clients/local authorities/professionals/contractors.

### **Projects worked on include**

- Compilation of SADC Biodiversity Strategy;
- Situation Analysis on the status of Biodiversity in Southern Africa;
- Patenting of natural resources in Southern Africa.

3. **Company:** IUCN-ROSA- The World Conservation Union  
**Position:** Intern: Ecosystems Programme

**Country:** Zimbabwe  
**Period:** 2002 - 2003

### **Roles**

- Work with regional, national, and international environmental organizations to help develop environmental management policies that takes into account economic, social, and environmental values;
- Production of summary documents and preliminary reports used in project formulation and design;
- Developing environmental project proposals for Southern Africa;
- Seek funding for the developed proposals;
- Develop situation analyses;
- Preparation of work plans and related key result areas;
- Preparation of implementation schedules, activity tasks, programme material requirements and itinerary for regional workshops.
- Documenting specific activities undertaken by the Ecosystems Programme.

### **Projects worked on include**

- Proposal for the Integration of HIV/AIDS in Natural Resources Management in Southern Africa;
- *Research article on Forest certification: A tool for sustainable development: Pumula Forest Block, Bulawayo, Zimbabwe;*

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### **REFEREES**




















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**Harare, Zimbabwe**  
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## APPENDIX B: SENSITIVITY MAP

**LIMPOPO EAST STRENGTHENING PROJECT**

**Legend**

-  Airports
-  132kv
-  Transmission Lines
-  Farm Portion
- Heritage**
-  Abandoned settlement
-  Grave site
-  Informal grave site
-  Open Air Museum
-  Fos Spen 1\_2\_1b
-  3km Corridor 1\_2\_1b
-  Low Sensitivity Avi Corr 1\_2\_1b
-  Med Sensitivity Avi Corr 1\_2\_1b
-  High Sensitivity Avi Corr 1-2-1b
-  River
-  High-Sensitivity Wetlands
- LCP Corridor 1\_2\_1b**
- Limpopo Conservation Plan**
-  Critical Biodiversity Area 1
-  Critical Biodiversity Area 2
-  Ecological Support Area 1
-  Ecological Support Area 2



Megawatt Park  
1 Maxwell Drive  
Sunninghill  
2191



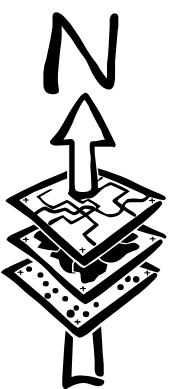
2 Constantia Park  
546, 16th Road  
Midrand  
1685

Sensitivity Map Corridor 1, 2 and 1b

Drawn By: B.M Date: January 2018

1:150 000 GCS\_Hartebeesthoek\_1994

Source: Esri Open Street Map  
Eskom  
Chris Van Rooyen  
Sazi Environmental  
Zoneland Solutions  
Limpopo Conservation Plan v2



0 5 10 Kilometers

