



**Appendix G1**

**ENVIRONMENTAL MANAGEMENT  
PROGRAMME**

In terms of

The National Environmental Management Act (Act 107 of 1998), the Environmental Conservation Act (Act no 73 of 1989), and the Environmental Impact Assessment Regulations, 2010 and 2014

for the proposed

**132 kV Nkwe Eskom substation and two  $\pm$  22km  
power lines with associated infrastructure**

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## EXECUTIVE SUMMARY

Enpro Industries was appointed by Eskom (the Applicant) to compile the Environmental Management Programme (EMP) for the proposed 132 kV Nkwe Eskom substation and two ± 22km power lines with associated infrastructure (the Development), which is required in terms of environmental legislation.

The EMP encourages best construction practices and ensures that environmental damage during construction is minimized. Moreover, the purpose of the EMP will be to control the potential negative environmental impacts associated with the construction as well as operational phase of the project in question, and/or to enhance any positive environmental impacts.

The effective implementation of the EMP will ensure that the construction and operational activities are conducted and managed in an environmentally sound and responsible manner. An EMP also details the organisational authority and structure required to ensure the effective implementation of the EMP, and measures to monitor and improve the application of the EMP. The EMP sets out minimum requirements specified in South African environmental legislation and general good environmental practices.

The EMP may be amended from time to time to ensure that any additional environmental requirements identified by key stakeholders are adequately covered.

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>2</b>
<b>CHAPTER 1 – BACKGROUND</b>	<b>5</b>
1.1 Introduction	5
1.2 Purpose of the Environmental Management Programme	5
1.3 Terms of Reference	6
1.4 Site Location and Description	6
1.5 Project Description	7
1.6 Using this EMP	7
<b>CHAPTER TWO – LEGAL AND OTHER REQUIREMENTS</b>	<b>8</b>
2.1 Introduction	8
2.1.1 Constitution	8
2.1.2 National Environmental Management Act 107 of 1998 (NEMA)	8
2.1.3 Environment Conservation Act 73 of 1989	9
2.1.4 Environmental Impact Assessment Regulations, 2010	10
2.1.5 Integrated Environmental Management Information Series	10
2.1.5.1 Information series 0 – Overview of Integrated Environmental Management	10
2.1.5.2 Information series 12 – Environmental Management Plans	11
2.1.6 Air Emissions	12
2.1.7 Water	13
2.1.7.1 Water Supply	13
2.1.7.2 Wastewater	13
2.1.7.3 Pollution	13
2.1.8 Waste	13
2.1.9 Hazardous Materials Management	14
2.1.10 Heritage Management	14
2.1.11 Explosives Management	14
2.1.12 Occupational Health and Safety	15
2.1.13 Other	15
2.2 Environmental Audit Report	15
<b>CHAPTER THREE – ORGANISATION AND MANAGEMENT STRUCTURE</b>	<b>16</b>
3.1 Introduction	16

3.2	Applicant	16
3.3	Environmental Control Officer	18
3.4	Contractor	18
3.5	Sub-Contractors	21
3.6	Compliance with the EMP	21
3.6.1	Tolerances	21
3.6.2	Transgressions and Non-compliance	21
3.6.3	Typical Incidents for which Actions can be taken	22
3.7	Removal from Site, and Suspension of the Works	24
	<b>CHAPTER FOUR – CONSTRUCTION</b>	<b>25</b>
4.1	Introduction	25
4.2	Eskom Vegetation Guidelines	25
4.2.1	Eskom’s Vegetation Management and Maintenance within Eskom Land, Servitudes and Rights of Way (Ref. No. 240-70172585)	25
4.2.2	Eskom Servitude Life Cycle Management Plan (Ref. No. TRMBPAAB8)	25
4.3	Site Establishment and Preliminary Activities	25
4.4	Management of Construction Activities	37
4.5	Post Construction Activities	54
	<b>CHAPTER 5 – BIODIVERSITY MANAGEMENT</b>	<b>58</b>

## CHAPTER 1 – BACKGROUND

### 1.1 Introduction

Enpro Industries was appointed by Eskom (the Applicant) to compile the Environmental Management Programme (EMP) for the proposed 132 kV Nkwe Eskom substation and two ± 22km power lines with associated infrastructure (the Development), which is required in terms of environmental legislation. In terms of Regulation 22 (2) of the Environmental Impact Assessment Regulations, 2010, a basic assessment report must contain all the information that is necessary for the competent authority to consider the application and to reach a decision contemplated in regulation 25, and must include, amongst others, a draft environmental management programme (EMP) containing the aspects contemplated in Regulation 33 (Regulation 22 (2) (l)).

It is the Applicant's respectful submission that this draft environmental management programme focuses on meeting and exceeding the requirements of the Regulations of the Environmental Impact Assessment Regulations, 2010, and that Mr. Potgieter is a suitably qualified environmental assessment practitioner as defined in Section 1 of the National Environmental Management Act (Act 107 of 1998) (NEMA) to compile this EMP.

### 1.2 Purpose of the Environmental Management Programme

An Environmental Management Programme (EMP) is required in terms of Regulation 22 (2) (l) of the Environmental Impact Assessment Regulations, 2010. The EMP must comply with Section 24N of NEMA and must be dealt with substantially in the form prescribed by Section 33 of the Environmental Impact Assessment Regulations, 2010.

The EMP encourages best construction practices and ensures that environmental damage during construction is minimized. Moreover, the purpose of the EMP will be to control the potential negative environmental impacts associated with the construction as well as operational phase of the project in question, and/or to enhance any positive environmental impacts. The effective implementation of the EMP will ensure that the construction and operational activities are conducted and managed in an environmentally sound and responsible manner. EMP's typically contain Environmental Specifications to which the

appointed Contractor will be required to adhere to throughout the duration of his contract, to reduce or prevent negative environmental impacts to the surrounding environment. An EMP also details the organisational authority and structure required to ensure the effective implementation of the EMP, and measures to monitor and improve the application of the EMP. The EMP sets out minimum requirements specified in South African environmental legislation and general good environmental practices. The EMP may be amended from time to time to ensure that any additional environmental requirements identified by key stakeholders are adequately covered. These amendments must be approved by the DEA.

### **1.3 Terms of Reference**

The Terms of Reference (TOR) is to compile a draft environmental management programme in terms of Regulation 22 (2) (1) of the Environmental Impact Assessment Regulations, 2010, and to ensure that said draft EMP complies in all respects with the requirements of Regulation 33 of the Environmental Impact Assessment Amendment Regulations, 2010.

### **1.4 Site Location and Description**

The proposed development consists of a new substation and power lines. It is located in the Limpopo Province in the Greater Tubatse Municipality (Greater Sekhukhune District Municipality). It lies to the east of the Leolo Mountains, within the 2430AC and 2430CA quarter-degree grid squares. The proposed power lines will run from the existing Leseding MTS station (24°38'10.61"S; 30° 7'30.57"E) to Nkwe substation (24°26'21.74"S; 30°1'2.46"E), covering a distance of approximately 22 km. The power lines will thus be 20 km North of Steelpoort and 3 km West of Driekop, running parallel with the R37 towards Polokwane. Alternative 1 (preferred site) for the proposed Nkwe substation is at 24°35'11.40"S and 30°4'54.60"E, whereas Alternative 2 (alternative site) is at 24°35'21.82"S and 30° 4'59.12"E. The portion over which the power lines runs and the proposed site for the substation is zoned agriculture.

The study area has an uneven topography with mountainous terrain and ridges interspersed with plains and undulating valleys. The proposed site is largely situated in a valley plain, to the east of the Leolo Mountains, crossing smaller hills and ridges in some areas. The altitude ranges from 784 m to 992 m a.s.l. at the lowest and highest recorded points respectively. The

soil class of the majority of the study area is swelling clay soils, associated with one or more melanic and red structured soils. Swelling clay soils are known to have high levels of natural fertility. In addition to its significant plasticity and stickiness, it also holds high swelling and shrinking potential. The remaining area consists largely of rocks, with limited soils and with restricted land use options and has historically been used for both agricultural lands and grazing pastures.

### **1.5 Project Description**

The layout of the proposed Development is attached to the Draft Basic Assessment Report. Environmental considerations were paramount in determining the layout of the development and the management policy for the construction phase as well as the operational phase. The indigenous fauna and flora as well as drainage lines have been taken into account in the planning phase.

### **1.6 Using this EMP**

The Applicant, its permanent or part-time employees including contractors, and others working or visiting the proposed Development, must adhere to the EMP. The EMP must be taken into consideration for all activities on the Development. The report has been divided into various sections, each dealing with a different “main” management activity (i.e. management of developed areas, management of open areas and monitoring). However as the environment is a complex system, and what happens in one area effects another, it is recommended that people understands the full scope of the EMP prior to carrying out an activity. Within the document are rules and regulations that must be adhered to, as well as recommendations and guidelines that should be adhered to. In the case of recommendations and guidelines, these must be followed unless more environmentally friendly approaches are identified and used. The Applicant, in consultation with the Environmental Control Officer (ECO), is responsible for approving the method prior to it being implemented. It is suggested that the Applicant remains in touch with up-to-date methods of environmentally friendly practices so as to implement these in combination with what has been discussed in this report.

## CHAPTER TWO – LEGAL AND OTHER REQUIREMENTS

### 2.1 Introduction

The Applicant shall ensure that all pertinent legislation concerning the protection of the natural environment and prevention of pollution is strictly enforced. The most commonly applicable legislation relevant to environmental management is listed below. All these laws and regulations relating to the environment shall be adhered to at all times. The EMP is to form part of the contractual obligations of the Applicant as well as all contractors and sub-contractors engaged in construction at the Development. Prior to the commencement of any construction, the contractor is to make him/herself aware of the contents of the EMP.

#### 2.1.1 Constitution

The Constitution of the Republic of South Africa, Act 108 of 1996, sets out the legal context in which environmental law in South Africa was formulated. All environmental aspects should be interpreted within the context of the Constitution, National Environmental Management Act 107 of 1998 and the Environment Conservation Act 73 of 1989. The Constitution has enhanced the status of the environment by virtue of the fact that an environmental right has been established (Section 24) and because other rights created in the Bill of Rights may impact on environmental management through, for example, access to health care, food and water and social security (Section 27). An objective of local government is to provide a safe and healthy environment (Section 152) and public administration must be accountable, transparent and encourage participation (Section 195(1) (e) to (g)).

#### 2.1.2 National Environmental Management Act 107 of 1998 (NEMA)

The objective of NEMA is to provide co-operative governance by establishing principles for decision makers on matters affecting the environment, institutions that promote co-operative governance and procedures for co-coordinating environmental functions exercised by the organs of state. Chapter 1 of the Act establishes a number of principles related to the environment in South Africa. These principles are designed to provide a general framework for environmental planning and guidelines for the interpretation, administration and



implementation of the Act. The principles include a number of internationally recognized environmental law norms and some principles peculiar to South Africa, i.e. the:

- Preventive principle
- Precautionary principle
- Polluter pays principle

Environmental management must place people and their needs at the forefront of its concerns, and serve their physical, psychological, economical, cultural and social interests equitably, must be socially, environmentally and economically sustainable. Sustainability requires the consideration of all relevant factors including the following:

- The disturbance of ecosystems and loss of biological diversity are avoided, or, minimized and remedied;
- Pollution and degradation of the environment are avoided, or, minimized and remedied
- Disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or, minimized and remedied;
- Waste is avoided, or, minimized and re-used or recycled where possible and otherwise disposed of in a responsible manner;
- Use and exploitation of non-renewable natural resources is responsible and equitable;
- The use and exploitation of renewable resources and the ecosystem of which they are part of do not exceed the level beyond which their integrity is jeopardized;
- A risk-averse and cautious approach is applied;
- Negative impacts on the environment and on the people's environmental rights are anticipated and prevented, and where they cannot be altogether prevented, are minimized and remedied.

This EMP has been designed to comply with said Act and focuses on meeting and exceeding the requirements thereof.

### **2.1.3 Environment Conservation Act 73 of 1989**

The objectives of this Act are to provide for the effective protection and controlled utilization of the environment. Following the enactment of NEMA, a number of the powers of the Act have either been repealed or may be repealed or assigned to the provinces. Nevertheless, this

EMP has been designed to comply with said Act and focuses on meeting and exceeding the requirements thereof.

#### **2.1.4 Environmental Impact Assessment Regulations, 2010**

An Environmental Management Programme (EMP) is required in terms of Regulation 31 (2) (p) of the Environmental Impact Assessment Regulations, 2010. The EMP must comply with Section 24N of NEMA and must be dealt with substantially in the form prescribed by Section 33 of the Environmental Impact Assessment Regulations, 2010. This EMP has been designed to comply with said Regulations and focuses on meeting and exceeding the requirements thereof.

#### **2.1.5 Integrated Environmental Management Information Series**

This document consists of a series of overview information documents on the concepts of, and approaches to, integrated environmental management (IEM). IEM is a key instrument of South Africa's National Environmental Management Act (NEMA). South Africa's NEMA promotes the integrated environmental management of activities that may have a significant effect (positive and negative) on the environment. IEM provides the overarching framework for the integration of environmental assessment and management principles into environmental decision-making. It includes the use of several environmental assessment and management tools that are appropriate for the various levels of decision-making. The aim of this document series is to provide general information on techniques, tools and processes for environmental assessment and management.

This EMP has been designed to comply with the Integrated Environmental Management Information Series and focuses on meeting and exceeding the requirements of said Series.

##### **2.1.5.1 Information series 0 – Overview of Integrated Environmental Management**

This document describes the concepts, principles and tools of Integrated Environmental Management (IEM). The purpose of the document is to inform all stakeholders who are involved in making decisions that could have an impact on the environment about the range of tools available to align their endeavors with the principles of sustainable development. An overview is provided of the emergence of environmental assessment and management

globally, followed by a summary of the development of IEM in South Africa. Based on this review, it is recognized that the globally applied term environmental assessment and management is comparable with the South African term integrated environmental management. IEM is shown to have evolved to be an underlying philosophy and set of principles, supported by a range of environmental assessment and management tools that are aimed at promoting sustainability. IEM provides a holistic framework that can be embraced by all sectors of society for the assessment and management of environmental impacts and aspects associated with each stage of the activity life cycle, taking into consideration a broad definition of environment and with the overall aim of promoting sustainable development. This document provides a summary of the more commonly used IEM tools. In conclusion, it is recognized that Integrated Environmental Management provides a set of underpinning principles and a suite of environmental assessment and management tools that are aimed at promoting sustainable development. IEM has the potential to play a major role in the imperative of guiding all sectors of society along a pathway to sustainability.

This EMP has been designed to comply with the Information series 0 – Overview of integrated environmental management document and focuses on meeting and exceeding the requirements of said document.

#### **2.1.5.2 Information series 12 – Environmental Management Plans**

In this document, attention is focused on the need to demonstrate that impacts can be monitored and managed. The Environmental Management Plan (EMP) is recognised as the tool that can provide the assurance that the project proponent has made suitable provisions for mitigation. The EMP is the document that provides a description of the methods and procedures for mitigating and monitoring impacts. The EMP also contains environmental objectives and targets which the project proponent or developer needs to achieve in order to reduce or eliminate negative impacts. The EMP document can be used throughout the project life cycle. It is regularly updated to be aligned with the project progress from construction, operation to decommissioning. EMPs provide a link between the impacts predicted and mitigation measures specified within the EIA report, and the implementation and operational activities of the project. EMPs outline the environmental impacts, the mitigation measures, roles and responsibilities, timescales and cost of mitigation. Three broad categories of EMPs

can be recognised in the project lifecycle. They are the construction phase EMP, the operational phase EMP and the decommissioning phase EMP. The objectives of these EMPs are all the same, namely to identify the possible environmental impacts of the proposed activity; and to develop measures to minimise, mitigate and manage these impacts. The difference between these EMPs is related to the difference in mitigation actions required for the different stages of the project cycle. The development and implementation of a successful EMP has benefits beyond merely meeting legal obligations. It contributes to environmental awareness of the workforce. It can facilitate the prevention of environmental degradation, and minimise impacts when they are unavoidable. EMPs add value to decision-making by demonstrating commitment to implementation of mitigation actions. The EMP facilitates progress towards environmental targets and provides a tool for continual improvement of a company's environmental performance.

This EMP has been designed to comply with the Information series 12 – Environmental Management Plans, and focuses on meeting and exceeding the requirements of said document.

#### **2.1.6 Air Emissions**

The control of atmospheric emissions of noxious, hazardous and nuisance causing materials is controlled by the National Environmental Management Air Quality Act, Act 39 of 2004 (the “Act”) and its amendments, including the National Environmental Management Air Quality Amendment Act, Act 20 of 2014. The object of this Act is:

- To protect the environment by providing reasonable measures for;
  - The protection and enhancement of the quality of air in the Republic;
  - The prevention of air pollution and ecological degradation; and
  - Securing ecologically sustainable development while promoting justifiable economic and social development; and
- Generally to give effect to section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people.

## **2.1.7 Water**

### **2.1.7.1 Water Supply**

The National Water Act 36 of 1998 ensures that water resources are adequately protected, used, developed, conserved and controlled. The Act deals with the strategies to facilitate the proper management of water resources, provides for the protection of the water resource and the regulation of the use of water.

### **2.1.7.2 Wastewater**

The National Water Act is the principal South African legislation governing wastewater management.

### **2.1.7.3 Pollution**

Section 19 of the National Water Act deals with pollution prevention and remedying effects, and in particular the situation where pollution of a water resource occurs or might occur as a result of activities on land. The party who owns controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources.

## **2.1.8 Waste**

Waste management is regulated by the: National Environmental Management Waste Act, Act 59 of 2008(as amended). The objects of this Act are:

- To protect health, well-being and the environment by providing reasonable measures for:
  - Minimizing the consumption of natural resources;
  - Avoiding and minimizing the generation of waste;
  - Reducing, re-using, recycling and recovering waste;
  - Treating and safely disposing of waste as a last resort;
  - Preventing pollution and ecological degradation;
  - Securing ecologically sustainable development while promoting justifi- able economic and social development;
  - Promoting and ensuring the effective delivery of waste services;
  - Remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and

- Achieving integrated waste management reporting and planning;
- To ensure that people are aware of the impact of waste on their health, well-being and the environment;
- To provide for compliance with the measures set out and to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

### **2.1.9 Hazardous Materials Management**

The Hazardous Substances Act 15 of 1973 governs the control of substances that may cause ill health or death in humans by reason of their toxic, corrosive, irritant, flammability or pressure effects. The Act regulates the storage, handling, labeling and sale of Group I, II, and III hazardous substances.

### **2.1.10 Heritage Management**

The National Heritage Resource Act (Act No. 25 of 1999) was introduced to ensure protection of South Africa's important heritage features. As such the act covers 4 billion years of history. The act covers the following areas of heritage value:

- Archaeology;
- Paleontology; and
- Meteorites.

All the above mentioned materials that are discovered are thus property of the state. Tools used to conserve and manage these resources are the formal regulated EIA processes as well as permits issued by the South African Heritage and Resources Agency (SAHRA) to restrict and/or regulate within a heritage environment.

### **2.1.11 Explosives Management**

The Explosives Act (Act No. 26 of 1956) aims to consolidate the laws relating to the manufacture, storage, sale, transport, importation and the use of explosives. It falls within the responsibility of the Minister of Safety and Security.

### **2.1.12 Occupational Health and Safety**

The Occupational Health and Safety Act of 1993 is South Africa's principle legislation concerning health and safety of employees. It also aims to protect persons who are not at work against hazard to health and safety arising out of or in connection with the activities of a person at work.

### **2.1.13 Other**

In addition to the requirements of this EMP, South African Legislation concerning the natural environment, pollution and the built environment must be strictly complied with. This legislation includes but is not limited to:

- The National Building Regulations and Building Standards Act (No 103 of 1977);
- Conservation of Agricultural Resources Act (No 43 of 1983) and the regulations dealing with declared weeds and invader plants as amended from time to time;
- Nature and Environment Conservation Ordinance (No 19 of 1974) and any subsequent legislation which is promulgated;
- Greater Tubatse Municipality Community Fire Safety Bylaws;
- Greater Tubatse Municipality Drainage and Sewage Bylaws; and
- Greater Tubatse Municipality Environmental Health Bylaws.

## **2.2 Environmental Audit Report**

The Applicant must submit an Environmental Audit Report (EAR) to the DEA annually until construction of all infrastructure and buildings has been completed. The audit report must indicate the progress of construction, detail compliance with the conditions of the Environmental Authorization and the status of rehabilitation programs.

## CHAPTER THREE – ORGANISATION AND MANAGEMENT STRUCTURE

### 3.1 Introduction

This section deals with the organisation and management structure pertaining to the implementation of the EMP. In order to ensure the sound and effective implementation of the EMP, it is necessary to identify and define the responsibilities and authority of the various persons and organizations. The following key roles are provided for during the implementation of the EMP:

- Applicant;
- Environmental Control Officer (ECO);
- Contractors; and
- Sub Contractors.

The following sections describe the roles and responsibilities for the implementation of and adherence to the EMP. The role and responsibilities of the key individuals described below are not exhaustive and may be modified and expanded and additional roles added as necessary.

### 3.2 Applicant

Ultimately, the Applicant is responsible for the implementation of the EMP and, where relevant, ensuring that the conditions in the Environmental Authorization are satisfied. The Applicant must therefore ensure that the environmental management requirements are met. All decisions regarding environmental procedures and protocol must be approved by the Applicant, who also has the authority to stop any construction activity that is in contravention of the EMP. Where construction or operation activities commences, the liability associated with non-compliance of the EMP rests with the Applicant.

An important part of the role of the Applicant is to:

- Undertake regular site visits and site inspections to ensure that environmental requirements are implemented;



- Be familiar with the contents of the EMP;
- Assume responsibility for compliance to all environmental regulatory and good management practice requirements for all aspects and for the duration of construction as well as during the operational phase, in order to ensure effective minimization of all environmental impacts caused directly or indirectly by any project activity;
- Ensure that the EMP is included in the tender documentation issued to prospective contractors;
- Establish and maintain regular and proactive communications with the Contractor and ECO;
- Communicate instructions to contractors, sub-contractors, and employees on the site, and ensure that they are conversant and comply with all relevant measures contained within the EMP;
- Review and comment on environmental assessments and/or reports produced by the Contractor and ECO;
- Issue site instructions giving effect to the ECO requirements where applicable;
- Communicate to the ECO, verbally and in writing, at least 10 working days in advance, any proposed actions which may have significant negative impacts on the environment;
- Undertake damage assessments where incidents, accidents and serious infringements have occurred on/off site;
- Report any significant environmental incident or impact to the relevant environmental authority and ECO;
- Inspect and approve all areas that have been rehabilitated by the Contractor;
- Act as the contact person for any public complaints or issues raised, jointly with the ECO;
- Review complaints received and issue instructions as necessary;
- Discuss with the ECO the application of penalties for the infringement of the Environmental Specifications, and other possible enforcement measures when necessary;
- Issue penalties as and when necessary;
- Implement Temporary Work Stoppages where serious environmental infringements and noncompliance's have occurred;

- Establish and maintain regular and proactive communications with the ECO;
- Review and comment on environmental assessments and/or reports produced by the ECO; and
- Ensure the EMP is fully implemented as well as revised and updated as and when required.

### **3.3 Environmental Control Officer**

The Applicant must appoint an Environmental Control Officer (ECO) for the proposed Development. As such, the ECO provides feedback to the Applicant regarding all environmental matters. Contractors, sub-contractors, and employees are answerable to the ECO and the Applicant for non-compliance with the requirements stated in the EMP. The responsibilities of the ECO include the following:

- Maintenance, update and review of the EMP;
- Liaison between the APPLICANT, owners, contractors, authorities and other lead stakeholders on all environmental issues;
- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective;
- Assisting in the resolution of conflicts;
- Communication of all modifications to the EMP to the relevant stakeholders; and
- Conducting regular audits to ensure that the system for implementing the EMP is operating effectively.

### **3.4 Contractor**

The Applicant will ensure that all Contractors appointed to work on the site are contractually required to undertake their activities in an environmentally responsible manner, as described in the EMP. Each Contractor affected by the EMP is also responsible for the on-site implementation of the EMP. The Contractor must ensure that he/she is suitably qualified to perform the necessary tasks and that he/she can interact effectively with other site contractors, laborers, the ECO and the public. The Contractor ensures that all sub-contractors working under the Contractor abide by the requirements of the EMP. The Contractor is answerable to the Applicant and the ECO for all environmental issues associated with the project.

Contractor performance will, amongst others, be assessed on health, safety and environmental management criteria.

The Applicant must inform the Contractor of the Environmental Authorization and EMP obligations. Contractors must communicate these obligations to their Sub-contractors and ensure that there is compliance. The Contractor or Sub-contractors will be required, where specified, to provide Method Statements setting out in detail how the management actions contained in an EMP will be implemented in order to ensure that the environmental management objectives are achieved. If separate Method Statements are provided by different Sub-contractors, these may need to be consolidated by the Contractor in order to ensure consistency and optimize overall environmental performance and use of resources. The Method Statements must be reviewed and approved by the Applicant and the ECO.

Specific to the EMP, the role and responsibilities of all Contractors working on site will be to:

- Be familiar with the contents of the EMP;
- Implement, manage and maintain the EMP for the duration of the contract;
- Appoint a suitably qualified Senior Manager, or act in his personal capacity, as Environmental Officer (EO) whose responsibility includes ongoing monitoring and control of all construction activities concerning minimization of environmental impact and adherence to the EMP for the duration of the construction phase;
- Ensure that all sub-contractors and other workers appointed by the Contractor are aware of their environmental responsibilities while on site or during the provision of their services at the site;
- Provide appropriate resources - budgets, equipment, personnel and training - for the effective control and management of the environmental risks associated with the construction activity;
- Comply with the Environmental Specifications contained in the EMP and subsequent revisions;
- Conform to legislative requirements for the construction works, and to ensure that appropriate permissions and permits have been obtained before commencing activities;

- Prepare Method Statements, if required, including drawings and programme of activities for submission to the Applicant and ECO;
- Undertake bi-monthly site inspections (with the Applicant and ECO) to monitor environmental performance and conformance with the Environmental Specifications;
- Review the ECO reports and take cognizance of the information/recommendations contained therein;
- Notify the ECO and Applicant, verbally and in writing, immediately in the event of any accidental infringements of the Environmental Specifications and ensure appropriate remedial action is taken;
- Notify the ECO and Applicant, verbally and in writing, at least 10 working days in advance of any activity he has reason to believe may have significant adverse environmental impacts, so that mitigatory measures may be implemented timorously;
- Ensure environmental awareness among his employees, sub-contractors and workforce so that they are fully aware of, and understand the Environmental Specifications and the need for them;
- Maintain a register of environmental training for site staff and sub-contractor's staff for the duration of the contract;
- Undertake rehabilitation of all areas affected by construction activities to restore them to their original states, as determined by the Applicant and the ECO;
- Undertake the required works within the designated working areas;
- Rehabilitating services, utilities, private/public property and other areas adversely affected by construction activities in accordance with the Applicant and ECO's instructions; and
- Communicate and liaise frequently and promptly with the ECO and the Applicant to ensure effective, proactive environmental management with the overall objective of preventing or reducing negative environmental impacts while enhancing positive environmental impacts.

The Contractor will also set up his own management system to ensure and monitor the application of the EMP and associated Environmental Specifications. This system shall, at a minimum, provide for:

- The preparation of Method Statements, if required, by the ECO;

- The effective and accountable management of construction activities relative to the Environmental Specifications;
- Reporting on a regular basis and as required to the Applicant and the ECO on environmental issues;
- Report in writing, all communication/correspondence with any party on environmental issues, to the Applicant and the ECO;
- The development of emergency and contingency plans for the key range of accidents and emergencies that may be associated with the construction; and
- Regular, constructive and proactive liaison with the ECO and the Applicant.

### **3.5 Sub-Contractors**

Sub-contractors will be appointed from time to time by the Contractor to perform certain services and/or provide certain products in association with the construction. Sub-contractors shall comply with the Environmental Specifications in the EMP and associated instructions issued by the Contractors to ensure compliance. Sub-contractors and their staff will be required to take part in the environmental awareness training as instructed by the Contractor. Sub-contractors will receive instructions from the Contractor.

### **3.6 Compliance with the EMP**

#### **3.6.1 Tolerances**

Environmental management is concerned not only with the final results of the Contractor's operations to carry out the Works, but also with the control of how those operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operation required to complete the Works. It is thus required that the Contractor shall comply with the environmental requirements on an ongoing basis and any failure on his part to do so will entitle the Applicant and the ECO to certify the imposition of a penalty subject to the details set out.

#### **3.6.2 Transgressions and Non-compliance**

The Applicant will take actions against the Contractor for transgressions and non-compliances where the Contractor inflicts damage upon the environment or fails to comply with any of the environmental specifications. The Applicant may take such Action per

incident at the discretion of the Applicant and the ECO and enforcement shall be at the discretion of the Applicant. Such actions shall be taken in addition to any remedial costs incurred as a result of noncompliance with the EMP. The Applicant will inform the Contractor of the contravention and if the issue of non-compliance is not addressed to the satisfaction of the ECO and Applicant within the specified timeframes, an independent firm will be appointed to undertake the rehabilitative works. The cost of this work will be recovered from the Contractor. The Applicant and ECO shall be the judge as to what constitutes a transgression in terms of this clause. The actions referred to aforesaid shall not absolve the Contractor from being liable from prosecution in terms of any law. The Contractor is deemed not to have complied with this Environmental Specification if:

- There is evidence of contravention of the Environmental Specification within the boundaries of the site, and/or haul/ access roads;
- Environmental damage ensues due to negligence; and
- The Contractor fails to comply with corrective or other instructions issued by the Applicant within a specific time.

### **3.6.3 Typical Incidents for which Actions can be taken**

- Failure to submit Method Statements timorously;
- Failure to demarcate working servitudes and/or maintain demarcation tape;
- Working or parking vehicles outside of the demarcated works areas and/or within the boundaries of a no-go area;
- Failure to strip topsoil with intact vegetation;
- Failure to stockpile topsoil correctly;
- Failure to stockpile materials in designated areas;
- Pollution of water bodies - including increased suspended solid loads;
- Failure to provide adequate sanitation, waste disposal facilities or services;
- Failure to demarcate 'No-go' Areas before commencing construction clearance and other activities;
- Insufficient education of staff regarding environmental matters and site housekeeping practices;
- Use of soil in an unspecified manner;
- Stockpile of soils and materials outside demarcated areas;

- Inappropriate mixing of cement/concrete and poor management of cement slurry;
- Untidiness and litter at camp;
- Unauthorized removal of indigenous trees, medicinal or other plants;
- Failure to erect temporary fences as required;
- Failure to reinstate disturbed areas within the specified timeframe;
- Costs of runaway fires will be borne by the Contractor, should he/she be proven responsible for such fires;
- Failure to provide equipment for emergency situations;
- Animal poaching;
- Removing or damaging natural or heritage features that may be found on site;
- Failure to maintain basic safety measures on site;
- Persistent and un-repaired oil leaks from machinery;
- The use of inappropriate methods of refueling;
- Failure to provide drip trays and/or empty them frequently;
- Inappropriate use of bins and poor waste management on site;
- Deliberate lighting of illegal fires on site;
- Individual not making use of the site ablution facilities;
- Excess dust or excess noise on or emanating from the site;
- Inappropriate use of adjacent watercourses and water bodies such as for unapproved water abstraction, washing of vehicles, wastewater disposal and use by staff for washing;
- Any person, vehicle, item of plant, or anything related to the Contractor's operations causing a public nuisance;
- Improper use of plant or equipment;
- Construction vehicles not adhering to speed limits;
- Failure to maintain a register of incidents on site;
- Failure to remove all temporary features and leftovers from the construction site and works areas upon completion of the works; and
- Any contravention of the Method Statement.

### **3.7 Removal from Site, and Suspension of the Works**

Non-compliance with the conditions of the EMP constitutes a breach of Contract. The Applicant, at the request of the ECO or of its own conviction, has the power to remove from Site any person who is in contravention of the EMP, and if necessary, the ECO in conjunction with the Applicant can suspend part or the whole of the works, as required.



## CHAPTER FOUR – CONSTRUCTION

### 4.1 Introduction

This section of the EMP deals with the construction of the substation and power lines with associated infra structure. The developed areas include the substation and power lines. The overseeing of construction activities will be the responsibility of the Applicant and the ECO.

### 4.2 Eskom Vegetation Guidelines

The following Guidelines issued by the Applicant shall be read with this EMP and the requirements thereof will be adhere to at all times:

#### 4.2.1 Eskom’s Vegetation Management and Maintenance within Eskom Land, Servitudes and Rights of Way (Ref. No. 240-70172585)

This deals with vegetation management in Eskom land including servitudes and rights of way, specifying general requirements and servitude widths to assist in the development of Scope of Work for servitude maintenance. It sets out the manner in which all initial servitude route clearing, and any subsequent vegetation maintenance is to be performed on Eskom servitudes. It sets the minimum standards for vegetation clearing and maintenance of Eskom land.

#### 4.2.2 Eskom Servitude Life Cycle Management Plan (Ref. No. TRMBPAAB8)

The life Cycle Management Plan (LCMP) for Transmission servitudes spans activities from the planning of new transmission lines, through the EIA, acquisition, negotiation and construction phases.

### 4.3 Site Establishment and Preliminary Activities

		<b><u>Monitor</u></b>	<b><u>Frequency</u></b>
<b>Access to site</b> Sound environmental principles must be followed whilst establishing access to the site	<b>Site Access</b> a) The contractor will make use of the 750m access road	Applicant/Contractor	Prior to moving onto site
	b) The location of all underground services and	Applicant/Contractor	Prior to moving onto site

	servitudes must be identified and confirmed		
<b>Setting up Construction Camp</b>	<p><b>Layout</b></p> <p>a) Refrain from using open grass areas as these are used for grazing by life stock. Encroached areas to be utilized as these can be rehabilitated to increase grazing capacity at the conclusion of construction</p>	Applicant/Contractor/ECO	During surveys and preliminary investigations and before moving onto site
	b) The construction camp may not be situated close to any drainage lines, water bodies or on slopes greater than 1:3	Contractor	During site set up
	<p>c) On-site accommodation may be required. The construction camp can thus be comprised of:</p> <ul style="list-style-type: none"> <li>• site office</li> <li>• ablution facilities</li> <li>• designated first aid area</li> <li>• eating areas</li> <li>• staff lockers and showers (where water and waterborne sewers are available or septic tanks have been constructed)</li> <li>• storage areas</li> <li>• cement mixing areas</li> <li>• refueling area (if required)</li> <li>• maintenance areas (if required)</li> <li>• Accommodation</li> </ul>	Contractor/ ECO	During site setup
	d) The Contractor must attend to drainage of the camp site to avoid standing water and/or erosion	Contractor/ECO	Ongoing, on a weekly basis
	<p><b>Ablutions</b></p> <p>a) Where waterborne sewerage is not available, temporary chemical toilets</p>	Contractor/ECO	During site set up and Ongoing

	<p>must be provided by a company that has been approved by the Applicant. Such toilets must be available for all site staff, both at the site camp and on site, as agreed by the Applicant. Toilets should be no closer than 50m from any water bodies or storm water inlets</p>		
	b) The construction of “long drop” toilets is forbidden	Contractor/ECO	Ongoing
	c) Under no circumstances may open areas or the surrounding bush be used as toilet facilities.	Contractor/ECO	During site set up and ongoing
	<p><b>Provision for Camp Waste Disposal</b></p> <p>a) Bins and / or skips shall be provided at convenient intervals for disposal of waste within construction camps.</p>	Contractor	Ongoing
	b) Bins should have liner bags for efficient control and safe disposal of waste.	Contractor	During site set up and ongoing
	c) Recycling and the provision of separate waste receptacles for different types of waste should be encouraged.	Contractor	During site set up and ongoing
<p><b>Establishing Storage Areas</b></p> <p>Storage areas can be hazardous, unsightly and can cause environmental pollution if not designed and managed carefully.</p>	<p><b>General Substances and Materials</b></p> <p>a) Choice of location for storage areas must take into account prevailing winds, distance to water bodies, stormwater drainage inlets, neighbors and general on-site topography</p>	Contractor/ECO	During site set up
	b) Storage areas must be designated, demarcated and fenced if necessary.	Contractor/ECO	During site set up
	c) Storage areas should be secure so as to minimize the risk of crime. They should be	Contractor/ECO	During site set up

	safe from access by children / animals etc.		
	d) Fire prevention facilities must be present at all storage facilities.	Contractor/ECO	During site set up
	<p><b>Hazardous substances and materials</b></p> <p>Definition of hazardous substances/materials is those that are potentially poisonous, flammable, carcinogenic or toxic. Some examples of hazardous substances/materials are:</p> <ul style="list-style-type: none"> <li>• diesel, petroleum, oil, bituminous products</li> <li>• cement</li> <li>• solvent based paints</li> <li>• lubricants</li> <li>• explosives</li> <li>• drilling fluids</li> <li>• hydraulic fluids</li> <li>• pesticides, herbicides</li> <li>• LPG</li> </ul> <p>a) Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes.</p>	Contractor/ECO	During site set up
	b) All hazardous substances are to be stored on an impermeable surface while on site to prevent contamination of soil in the case of a spill or leak.	Contractor	Ongoing
	c) Storage areas containing hazardous substances /	Contractor/ECO	During site set up/when

	materials must be clearly signed.		bringing Hazardous substances onto site
	d) Staff dealing with these materials/substances must be aware of their potential impacts and follow the appropriate safety measures.	Contractor	During staff induction and ongoing as necessary
<b>Materials Management – Sourcing</b> Materials must be sourced in a legal and sustainable way to prevent off – site environmental degradation	<b>Source of Materials</b> a) Contractors must be able to provide proof of sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners, etc.) if requested by the ECO or relevant authorities.	Contractor	On award of contract
	b) Where possible, a signed document from supplier of natural materials should be obtained confirming that they have been obtained in a sustainable manner in compliance with the relevant legislation.	Contractor	On receipt of natural materials
<b>Education of Site Staff on General and Environmental Conduct</b> These points need to be made clear to all staff on site before the Project begins.	<b>Environmental Education and Awareness</b> a) Ensure that all site personnel have a basic level of environmental awareness training. The Contractor must submit a proposal for this training to the ECO for approval. Topics covered should include: <ul style="list-style-type: none"> <li>• What is meant by environment</li> <li>• Why the environment needs to be protected</li> </ul>	Contractor/ECO	During staff induction and ongoing

	<p>and conserved</p> <ul style="list-style-type: none"> <li>• How construction activities can impact on the environment</li> <li>• What can be done to mitigate against such impacts</li> <li>• Awareness of emergency and spill response provisions.</li> <li>• Social responsibility during construction e.g. being considerate to local residents</li> </ul>		
	<p>b) It is the ECO responsibility to provide the contractor with no less than one hour's environmental training and ensure that the foreman has sufficient understanding to pass this information onto the construction staff.</p>	ECO	Prior to moving on site
	<p>c) The Applicant/ECO should be on hand to explain more difficult / technical issues and to answer questions.</p>	Applicant/ECO	Ongoing
	<p>d) The use of pictures and real - life examples is encouraged as these tend to be more easily remembered.</p>	Applicant/ECO	Ongoing
	<p>e) Construction workers should be made aware that they are not to make excessive noise (e.g. shouting / hooting) as the site is near to residential areas.</p>	Contractor/ECO	During staff induction, followed by ongoing monitoring
	<p>f) The need for a "clean site" policy also needs to be explained to construction workers.</p>	Contractor/ECO	During staff induction, followed by ongoing monitoring

	<p><b>Worker Conduct on Site</b> A general regard for the social and ecological well being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules:</p> <p>a) No alcohol / drugs to be present on the site</p>	Contractor/ECO	During staff induction, followed by ongoing monitoring
	b) No firearms allowed on site or in vehicles transporting staff to and from site, unless used by security personnel.	Contractor	Ongoing
	c) Prevent excessive noise.	Contractor	Ongoing
	d) Prevent unsocial behavior	Contractor	Ongoing
	e) Bringing pets onto the site is forbidden	Contractor	Ongoing
	f) No harvesting of firewood from the site or from the areas adjacent to it.	Contractor	Ongoing
	g) Construction staff are to make use of the facilities provided for them, as opposed to ad hoc alternatives (e.g. fires for cooking, the use of surrounding bush for toilet facilities)	Contractor	Ongoing
	h) Trespassing on private/commercial properties adjoining the site.	Contractor	Ongoing
	i) Driving under the influence of alcohol is prohibited.	Contractor	Ongoing
<p><b>Dust / Air Pollution</b> Establishment of the camp site, and related temporary works can reduce air quality</p>	a) Camp construction / haulage road construction areas that have been stripped of vegetation must be dampened periodically to avoid excessive dust.	Contractor/ECO	Ongoing - more frequently during dry and windy conditions

	b) The Contractor must make alternative arrangements (other than fires) for cooking and / or heating requirements. LPG cookers may be used, provided that all safety regulations are followed.	Contractor/ ECO	Ongoing
<b>Soil Erosion</b> The stripping of vegetation during preliminary activities on site greatly increases the risk of erosion	a) The time that stripped areas are left open to exposure should be minimized wherever possible.	Contractor/ECO	Throughout the duration of the project
	b) Wind screening and storm water control should be undertaken to prevent soil loss from the site.	Contractor/ECO	During the site set up
	c) Procedures that are in place to conserve topsoil during the construction phase of the project are to be applied to the set up phase, i.e. topsoil is to be conserved while providing access to the site and setting up the camp.	Contractor/ECO	Daily monitoring during the site set up.
<b>Storm water</b> Serious financial and Environmental impacts can be caused by unmanaged stormwater	a) To prevent storm water damage, the increase in stormwater run off resulting from construction activities must be estimated and the drainage system assessed accordingly. A drainage plan must be compiled by the APPLICANT and submitted to the ECO for approval.	Applicant/ECO	During surveys and preliminary investigations
	b) Temporary cut off drains and berms may be required to capture storm water and promote infiltration.	Contractor	During site set up
<b>Water Quality</b> Incorrect disposal of substances and materials and	a) Storage areas that contain hazardous substances must be bunded with an impermeable	Contractor	During site set up



polluted runoff can have serious negative effects on groundwater quality	liner.		
	b) Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimize pollution risk and reduced bunding capacity	Contractor/ECO	During site set up
	c) Sewerage conservancy tank on site is to be used to contain grey water generated from vehicle washing and maintenance (if needed). Materials caught in this bunded area must be disposed of to a suitable waste site.	Contractor/ECO	During site set up
	d) If applicable, provision should be made during set up for all polluted runoff to be treated to the ECO's approval before being discharged into the storm water system. (This will be required for the duration of the project).	Contractor/ECO	During site set up, to be monitored weekly.
<p><b>Conservation of Natural Environment</b></p> <p>Alien plant encroachment is particularly damaging to natural habitats and is often associated with disturbance to the soil during construction activities. Care must be taken to conserve existing plant and animal life on and surrounding the site</p>	<p><b>Fauna and Flora</b></p> <p>a) Vegetation clearance to be done in accordance with the Applicant's prescribed guidelines, e.g., Vegetation Management and Maintenance within Eskom Land, Servitudes and Rights of Way (Ref. No. 240-70172585)</p>	ECO	During site set up and ongoing
	b) Trees that are not to be	Contractor/ECO	During site set

	cleared should be marked beforehand		up
	c) 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).	Contractor	Ongoing in camp site, haulage areas
	d) No poaching of fauna is allowed and the disturbance of birds, animals and reptiles and their habitats should be minimized wherever possible.	Contractor/ECO	During surveys and preliminary investigations and ongoing
	e) In situations where the threatened and protected plants must be removed, Eskom may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development of a rescue and recovery program is suggested for the protection of these species. This is particularly important in the case of rare and threatened species e.g. <i>Searsia batophylla</i> and <i>Orbea</i> species. Small aloes and bulbous geophytes, not interfering with the construction and operation of the development e.g. the clearing distance of the power line, should not be removed or should be replanted where possible.	Contractor/ECO	During surveys and preliminary investigations and ongoing
<b>Set up of Waste Management</b>	a) The excavation and use of rubbish pits on site is	ECO	Ongoing

<b>Procedures</b>	forbidden. No waste is to be buried on site		
	b) Burning of waste is forbidden.	ECO	Ongoing
	c) A fenced area must be allocated for waste sorting.	ECO	During site set up
	d) Individual skips for different types of waste (e.g. “household” type refuse, building rubble, etc.) should be provided. Building rubble or any other waste is not to be stockpiled outside the property boundaries.	ECO	During site set up
<b>Social Impacts – Visual and Noise</b> It is important to take notice of the needs and wishes of those living and working adjacent to the site. Failure to do so can cause disruption to work and increase costs in the form of delays.	<b>Public</b> a) The contractor must be aware of neighboring land owners during the construction process	Contractor/ECO	Ongoing
	<b>Noise Impacts</b> a) Construction vehicles’ silencers (mufflers) must be operational and in good working order prior to the beginning of construction.	Contractor/ECO	Prior to moving onto the site and ongoing
	<b>Visual Impacts</b> a) Storage facilities, elevated tanks and other temporary structures should be located such that they have as little visual impact on local residents as	Contractor/ECO	During surveys and preliminary investigations and site set up.

	possible.		
	b) Special attention should be given to the screening of highly reflective materials on site.	Contractor/ECO	During site set up
<b>Cultural Environment</b>	Prior to commencement of construction, all staff need to know what possible archaeological or historical objects of value may look like, and to notify the Contractor/ECO should such item be uncovered.	Contractor/ECO	During site set up and ongoing.
<b>Security and Safety</b>	<b>Fencing</b> a) Secure the site in order to reduce the opportunity for criminal activity in the locality of the construction site.	Contractor	During site set up
	b) Potentially hazardous areas such as trenches are to be demarcated and clearly marked.	Contractor	During site set up
	<b>Lighting</b> Lighting on site is to be set out to provide maximum security and to enable easier policing of the site, without creating a visual nuisance to local residents or businesses.	Contractor	During site set up
	<b>Risks Associated with Material on Site</b> a) Material stockpiles or stacks must be stable and well secured to avoid collapse and possible injury to site workers /local residents	Contractor/ECO	Ongoing
	b) Flammable materials should be stored as far as possible from adjacent residents	Contractor/ECO	Ongoing
	c) Firefighting equipment should be present on site at all times as per OHSA	ECO	Ongoing

	d) Obstruction to driver's line of sight due to stockpiles and stacked materials must be avoided, especially at intersections and sharp corners	Contractor/ECO	Ongoing
	e) No materials are to be stored in unstable or high-risk areas, such as on steep slopes.	Contractor/ECO	Ongoing

#### 4.4 Management of Construction Activities

		<b><u>Monitor</u></b>	<b><u>Frequency</u></b>
<b>Access to Site</b>	<b>Maintenance of Access</b> a) If necessary, staff must be employed to clean surfaced roads adjacent to construction sites where materials have been spilt.	Contractor/ECO	When necessary
	b) Unnecessary compaction of soils by heavy vehicles must be avoided; construction vehicles must be restricted to demarcated access, haulage routes and turning areas.	Contractor/ECO	Ongoing
<b>Maintenance Of Construction Camp</b>	<b>Surfaces</b> a) The Contractor must monitor and manage drainage of the camp site to avoid standing water and soil erosion	Contractor	Ongoing
	b) Run off from the site camp must not be discharged into neighboring properties.	Contractor/ECO	Ongoing
	<b>Ablutions</b> a) An adequate number of self-contained chemical toilets must be established	ECO	Weekly inspections

	on site i.e. at least one toilet for every 30 workers.		
	b) Chemical toilets are to be maintained in a clean state (serviced by a registered chemical waste company) and should be moved if required to ensure that they adequately service the work areas	Contractor/ECO	Ongoing
	c) Contractors must ensure that no spillage occurs when chemical toilets are cleaned, and that the contents are properly stored and removed off-site	Contractor/ECO	Weekly inspection
	d) The Contractor is to ensure that open areas or the surrounding bush are not being used as a toilet facility	Contractor/ECO	Ongoing
	<b>Camp Waste Disposal</b> a) The Contractor shall ensure that all litter is collected from the work and camp areas daily	Contractor	Weekly
	b) Bins and / skips should be emptied regularly and waste should be disposed of at a registered landfill site. Waybills for such disposals are to be kept by the Contractor for review by the ECO	Contractor/ECO	Ongoing
	<b>Eating Areas</b> a) Eating areas should be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness.	Contractor	Ongoing
	b) All litter throughout the site should be picked up	Contractor	Ongoing

	and placed in the bins provided.		
	<b>Housekeeping</b> The Contractor shall ensure that his camp and working areas are kept clean and tidy at all times	Contractor/ECO	Weekly monitoring
<b>Staff Conduct</b>	<b>Environmental Education and Awareness</b> The Contractor must monitor the performance of construction workers to ensure that the points relayed during their induction have been properly understood and are being followed. If necessary, the ECO and / or a translator should be called to the site to further explain certain aspects of environmental or social behavior that are unclear.	Contractor	Ongoing monitoring
	<b>Worker Conduct on Site</b> The rules that are explained in the worker conduct section must be followed at all times during the construction phase of the development.	Contractor/ECO	Ongoing
<b>Dust/Air Pollution</b>	a) Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilized immediately.	Contractor/ECO	Throughout the Bulk Earthworks Phase / Ongoing
	b) Excavation, handling and transport of erodible materials, especially	Contractor/ECO	As directed by ECO

	adjacent to public roads, must be avoided under high wind conditions.		
	c) Soil stockpiles must be located in sheltered areas (where possible) where they are not exposed to the erosive effects of the wind.	Contractor	Ongoing
	d) Stockpiles may cause dust and must be managed in such a way to ensure minimal dust pollution under the circumstances.	Contractor	Ongoing
	e) Access and other cleared surfaces must be Dampened whenever possible and especially in dry and windy conditions to avoid excessive dust.	Contractor	Ongoing
	f) Where dust is unavoidable adjacent to residential or commercial areas, screening will be required utilizing wooden supports and shade cloth.	Contractor	As directed by PM
	g) Vehicles and machinery are to be kept in good working order and to meet manufacturer's specifications for safety, fuel consumption etc.	Contractor	Ongoing
	h) Should excessive emissions be observed, the Contractor is to have the equipment seen to as soon as possible.	Contractor	As directed by PM
<b>Soil Erosion</b> Given the erosion & sensitive soils on the site, exposed soil of a high gradient will	<b>Topsoil Stripping and Stockpiling</b> a) Strategic vegetation clearance must be ensured, i.e. in a staged approach to	Contractor/ECO	Ongoing



present a significant erosion hazard	maximize the time soil remains protected by vegetation cover. The time the stripped areas are exposed must be minimized where possible.		
	b) Once an area has been cleared of vegetation, the top layer (nominally 150mm) of soil should be removed and stockpiled in a designated area.	ECO	Ongoing
	<b>Exposed surfaces</b> a) Top soiling and re-vegetation shall commence immediately after the completion of an activity to reduce the risk of soil erosion.	Contractor/ECO	As each activity is completed
	b) Side tipping of spoil and excavated materials shall not be permitted - all soil material shall be disposed of as directed by the ECO.	Contractor/ECO	Ongoing
	c) Battering of all banks shall be such that cut and fill embankments are no steeper than previous natural slopes, unless otherwise agreed between the Contractor and ECO. Cut and fill embankments steeper than previous ground levels shall be re-vegetated immediately on completion of trimming or shall be protected against erosion using bioengineered stabilization measures.	Contractor/ECO	As the cut and fill activity is completed
	d) All embankments, unless otherwise directed by the	Contractor	Immediately after the creation

	Applicant, shall be protected by a cut off drain to prevent water from cascading down the face of the embankment and causing erosion.		of the embankment / stripping of vegetation.
<b>Storm water</b> Construction activities frequently result in diversions of natural water flow resulting in concentration of flow and an increase in the erosive potential of the water. Measures in this section are aimed at reducing the erosive potential of stormwater	<b>General Principles</b> a) Where applicable, earth berms, constructed to the satisfaction of the engineer and Applicant must be put in place to intercept and detain all potential storm water runoff. Spillway areas to be lined in such a way as to prevent erosion (e.g., with pipes and or plastic sheeting).	Contractor/ECO	During planning and Ongoing
	b) Earth, stone and rubble is to be properly disposed of as not to obstruct natural water pathways over the site.	Contractor	Monitoring throughout the duration of the project.
	c) There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.	Contractor/ECO	Monthly checking
	d) The use of high velocity storm water pipelines should be avoided in favor of open, high friction, semi-permeable channels wherever feasible.	Contractor/ECO	As directed by the Applicant
	<b>Un-channeled Flow</b> a) During construction, un-channeled flow must be controlled to avoid soil	Contractor/ECO	As surfaces become exposed

	erosion. Where applicable and where large areas of soil are left exposed, rows of straw/hay/sand bags/bundles of cut vegetation, etc., should be dug into the soil in contours to slow surface wash and capture eroded soil. The spacing between rows will be dependent on slope.		
	b) Where surface run-off is concentrated (e.g. along exposed roadways/ tracks), flow should be slowed by contouring with hay bales or bundled vegetation generated during site clearance operation.	Contractor/ECO	Ongoing
<p><b>Water Quality</b> Water quality is affected by the incorrect handling of substances and materials. Soil erosion and sediment is also detrimental to water quality. Mismanagement of polluted runoff from vehicle and plant washing and wind dispersal of dry materials into rivers and watercourses are detrimental to water quality.</p>	<p><b>To protect the soil surface, groundwater, streams and watercourses from possible contamination from hazardous substances and sediment from soil erosion, a number of mitigatory steps can be taken.</b></p> <p>a) Mixing/decanting of all chemicals and hazardous substances must take place either on a tray or on an impermeable surface. Waste from these should then be disposed of to a suitable waste site.</p>	Contractor/ECO	Regular monitoring
	b) Every effort should be made to ensure that any chemicals or hazardous	Contractor/ECO	Regular monitoring

	substances do not contaminate the soil or ground water on site		
	c) Care must be taken to ensure that run off from vehicle or plant washing does not enter the ground water.	Contractor/ECO	Regular monitoring
	d) Site staff shall not be permitted to use any nearby stream, river, other open water body or natural water source adjacent to the designated site for the purposes of bathing, washing of clothing, or for any construction or related activities. Municipal water (or another source approved by the Municipality' Environmental Officer) should instead be used for all activities such as washing of equipment, or disposal of any type of waste, dust suppression, concrete mixing, compaction, etc.	Contractor/ECO	Daily monitoring
	e) Emergency contact numbers in case of spillages of potentially polluting and / or hazardous chemicals should be in the possession of the APPLICANT and should be displayed in the site office.	Contractor/ECO	From start of project
<b>Conservation of Natural Environment</b> Although the	<b>Fauna and Flora</b> a) No indigenous vegetation within the site area is to be removed or	ECO	Ongoing

proposed location of the building site has been chosen, with the intention to limit the impact on environmentally sensitive areas, a certain amount of disturbance to fauna and flora is unavoidable	damaged other than that which has been agreed upon with the Contractor and ECO and has been indicated on the approved site plan. Any contraventions of this principle will make the contractor liable to make good at their expense.		
	b) Gathering of firewood, fruit, muthi plants, crops or any other natural material on site or in areas adjacent to the site is prohibited.	ECO	Ongoing
	c) The hunting of birds and animals and setting of snares and traps on site and in surrounding areas is forbidden. Education, monitoring and fines should be used as deterrents	ECO	Ongoing monitoring
	d) Immediate re-vegetation of stripped areas and removal of alien plants by weeding must take place. This significantly reduces the amount of time and money that must be spent on alien plant management during rehabilitation.	ECO	Ongoing
	e) Alien vegetation encroachment onto site as a result of construction activities must be controlled during construction.	ECO	Twice monthly Monitoring
	f) In situations where the threatened and protected plants must be removed,	Contractor/ECO	Ongoing

	<p>Eskom may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development of a rescue and recovery program is suggested for the protection of these species. This is particularly important in the case of rare and threatened species e.g. <i>Searsia batophylla</i> and <i>Orbea</i> species. Small aloes and bulbous geophytes, not interfering with the construction and operation of the development e.g. the clearing distance of the power line, should not be removed or should be replanted where possible.</p>		
<p><b>Materials Management</b> Stockpiling of soil can result in the loss of nutrients (leaching) loss of structure, compaction and colonization by invasive plants. Careful management is therefore needed</p>	<p><b>Stockpile Management</b> a) Stockpiles should not be situated such that they obstruct water pathways i.e. they shouldn't extend outside the properties boundaries and impact adjacent storm water inlet drains.</p>	Contractor/ECO	Location as discussed by Contractor & ECO
	<p>b) Stockpiles should not exceed 2m in height unless otherwise agreed with the ECO.</p>	Contractor/ECO	As this becomes necessary
	<p>c) If stockpiles are exposed to windy conditions or</p>	Contractor/ECO	Ongoing

	heavy rain, they should be covered either by vegetation, or sheeting, depending on the duration of the project. Stockpiles may be further protected by the construction of berms or low brick walls around their bases d) Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding.		
	<b>Handling of Hazardous Materials</b> a) All concrete mixing must take place on a designated, impermeable surface, sufficiently large to trap spillages.	Contractor/ECO	Ongoing
	b) No vehicles transporting concrete to the site must be washed on the site.	Contractor/ECO	Ongoing
	c) No vehicles transporting, placing or compacting asphalt or any other bituminous product may be washed on site.	Contractor/ECO	Ongoing
	d) Lime and other powders must not be mixed during excessively windy conditions.	Contractor	Ongoing
	e) All substances required for vehicle maintenance and repair must be stored in sealed containers until they can be disposed of / removed from the site.	Contractor/ECO	Ongoing
	f) Hazardous substances / materials are to be transported in sealed containers or bags.	Contractor/ECO	Ongoing
	g) Spraying of herbicides /	Contractor/ECO	Ongoing

	pesticides should not take place under windy conditions and must comply with OHSA specs and other chemical handling laws.		
	h) Hazardous Materials must be stored in designated and appropriately constructed areas within a secured area/site camp within the footprint.	Contractor/ECO	As required
	i) The Contractors must identify fuels and hazardous substances to be stored on the site, and must ensure that they know the effects of these substances on their staff and the environment. A copy of the fuels and hazardous substance inventory (MSDS Sheets) must be kept by the Contractor.	Contractor/ECO	Ongoing
	j) All fuels, oils and chemicals which are stored in tanks or drums must be located within a brickwork bund to prevent liquids from escaping in the event of a spill or leak. The volume of the bund must be 110% of the volume of the storage tanks.	Contractor/ECO	Prior to hazardous substances being stored on site
	k) The integrity of the hazardous materials storage vessels and bunding must be checked on a regular basis (quarterly) using approved methodologies.	Contractor/ECO	Quarterly
	l) Hazardous material	ECO	Ongoing



	storage areas must be kept a considerable distance away from all storm water inlets, therefore reducing the risk of hydrological contamination.		
	<p><b>Spill and Leak Procedure-Contingency Plan</b></p> <p>a) The accidental or negligent spillage of any fuels or potentially hazardous substances must be cleaned up immediately using the appropriate methodologies, equipment and materials.</p>	ECO	In the case of a Spill
	b) The contractor must ensure that the necessary materials, equipment and chemicals are available on the site to deal with spills of any of the hazardous substances/materials present.	ECO	Prior to hazardous substances being stored on site
	c) Construction workers and staff on site must be trained to carry out a spill contingency plan should such an event occur.	Contractor/ECO	Prior to hazardous substances being stored on site
	d) Any contaminated soil or water must be removed and stored in a skip until it can be disposed of at a permitted disposal site.	Contractor/ECO	Ongoing
<b>Waste management</b>	<p><b>On - site Waste Management</b></p> <p>a) Refuse must be placed in designated skips / bins which must be regularly emptied. These should remain within demarcated</p>	Contractor	Ongoing

	areas and should be designed to prevent refuse from being blown out by wind.		
	b) In addition to the waste facilities within the construction camp, provision must be made for waste receptacles to be placed at intervals along the work front.	Contractor/ECO	Ongoing
	c) Littering on the site is forbidden and the site shall be cleared of all litter at the end of each working day.	Contractor/ECO	Ongoing
	d) Recycling is to be encouraged by providing separate receptacles for different types of waste and making sure that staff are aware of their uses.	Contractor/ECO	Ongoing
	<p><b>Waste disposal</b></p> <p><b>Non - hazardous waste:</b> All waste and construction rubble must be removed from the site and transported to an approved landfill site.</p> <p>a) Waybills proving disposal at each site shall be kept by the Contractor for inspection.</p>	Contractor	As required
	b) Waste from chemical toilets should be disposed of regularly and in a responsible manner by a registered waste contractor. Care must be taken to avoid contamination of soils and water, pollution and nuisance to adjoining areas.	Contractor/ECO	Checked at each site meeting
		Contractor	Monitored weekly and at the start of the builders holidays

	<p><b>Hazardous Wastes:</b> a) Hazardous waste disposal must be carried out by an approved waste contractor to an approved hazardous waste disposal site.</p>	Contractor	Ongoing
	<p>b) A sump (earth or other) must be created for concrete waste. This is to be de-sludged regularly and the cement waste is to be removed to an approved waste disposal site</p>	Contractor/ECO	As required
<p><b>Social Impacts</b> A system should be established to ensure that public complaints / queries / comments are recorded and addressed appropriately for the duration of the project.</p>	<p><b>Disruption of Infrastructure and Services</b> <b>General:</b> a) Contractor's activities and movement of staff to be restricted to designated construction areas.</p>	Contractor	Ongoing
	<p>b) Should construction staff be approached by members of the public, they should assist them in locating the Applicant, or provide a number on which they may contact the Applicant</p>	Contractor/ECO	Ongoing
	<p>c) The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous at all times. Failure to adhere to this requirement may result in the removal of staff from the site by the Applicant</p>	Contractor	Ongoing

	d) Disruption of access for local residents must be minimized and must be monitored by the Contractor	Contractor	Ongoing
	e) The contractor is to inform neighbors in writing of disruptive activities at least 24 hours beforehand. This can take place by way of leaflets at their residences	Contractor/ECO	At least 24 hours prior to the activity taking place Ongoing
	<b>Traffic:</b> a) Traffic must have the right of way at all times	Contractor	Ongoing
	<b>Visual Impacts:</b> a) Lighting on the construction site should be pointed downwards and away from oncoming traffic and nearby houses.	Contractor/ECO	Ongoing
	b) The site must be kept clean to minimize the visual impact of the site.	Contractor/ECO	Ongoing/ weekly monitoring
	c) If screening is being used, this must be moved and re-erected as required as work progresses.	Contractor/ECO	Ongoing
	<b>Noise:</b> a) Machinery and vehicles are to be kept in good working order for the duration of the project to minimize noise nuisance to neighbors.	Contractor/ECO	Ongoing
	b) Notice of particularly noisy activities must be given to residents / businesses adjacent to the construction site. Examples of these include: Noise generated by jackhammers,	Contractor/ECO	At least 24hrs prior to the activity taking place

	Drilling, Blasting.		
	c) Noisy activities must be restricted to the times agreed with the Local Authorities and neighboring residents.	Contractor	Ongoing
	<b>Communication with public:</b> a) The Applicant is responsible for addressing queries, comments and complaints from the general public.	Contractor/ECO	Ongoing
	b) A complaints register should be housed at the site office, with numbered pages. Any missing pages must be accounted for.	ECO	Ongoing
	c) Queries and complaints are to be handled by: <ul style="list-style-type: none"> <li>• Documenting details of such communications in the complaints register</li> <li>• Taking remedial action in consultation with the ECO as required.</li> </ul>	Contractor/ECO	Ongoing
<b>Cultural Environment</b>	Although the site is very unlikely to contain any artifacts, excavations may unearth items of historical or archaeological value i.e. old stone foundations, tools, clayware, jewellery, remains, fossils, etc. In the remote chance that this does occur, SAHRA must be informed and all	Contractor/ECO	Ongoing

	construction must be halted until the necessary approval has been obtained from them.		
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#### 4.5 Post Construction Activities

		<b>Monitor</b>	<b>Frequency</b>
<b>Construction Camp</b>	a) All structures comprising the construction camp are to be removed from the site and surrounding areas.	Contractor	Project completion
	b) The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, diesel, etc. and these should be cleaned up.	Contractor	Project completion
	c) All hardened surfaces within the construction camp area should be ripped, all imported materials removed, and the area shall be top soiled and regressed according to the re-vegetation specifications provided by the ECO	Contractor	Project completion
	d) The Contractor must arrange the cancellation of any temporary services.	Contractor	Project completion
<b>Vegetation</b>	a) All areas that have	Contractor	Project

	been disturbed by construction activities (including the construction camp area) must be cleared of alien vegetation		completion
	b) All vegetation that has been cleared during construction is to be removed from site or used as mulch, (except for seeding alien vegetation)	Contractor	Project completion
<b>Land Rehabilitation</b>	a) All surfaces hardened due to construction activities are to be ripped and imported materials thereon removed.	Contractor	Project completion
	b) All rubble is to be removed from the site to an approved disposal site. Burying rubble on the site is prohibited.	Contractor	Project completion
	c) The site and surrounding areas is to be cleared of all litter.	Contractor	Project completion
	d) Surfaces are to be checked for waste products from activities such as concreting or asphaltting.	Contractor/ECO	Project completion
	e) All embankments are to be trimmed, shaped and replanted to the satisfaction of the ECO.	Contractor/ECO	Project completion
	f) The Contractor is to check that all	Contractor/ECO	Project completion

	watercourses are free from building rubble, spoil materials and waste materials.		
<b>Materials and Infrastructure</b>	a) All residual stockpiles must be removed to spoil or spread on site as directed by the Applicant.	Contractor/ECO	On completion of construction
	b) All leftover building materials must be returned to the depot or removed from the site.	Contractor/ECO	On completion of construction
	c) The Contractor must repair any damage that the construction works has caused to neighboring properties.	Contractor/ECO	On completion of construction
	d) Fences, barriers and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the Applicant.	Contractor/ECO	On completion of construction
<b>General</b>	a) A meeting is to be held on site between the Contractor, Applicant and ECO to approve all remediation activities and ensure that the site has been restored to a condition acceptable to the ECO and Applicant	Applicant/Contractor/ECO	On completion of construction
	b) All areas where	Contractor/ECO	On completion of



	temporary services were installed are to be rehabilitated to the satisfaction of the ECO.		construction
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## CHAPTER 5 – BIODIVERSITY MANAGEMENT

No recommendations are made pertaining to the operational phase of the proposed Development other than the principles of Biodiversity Management contained in this Chapter. The main objective of Biodiversity Management (BM) is to ensure that the natural environment at any site of development is negatively impacted as little as possible, and where negative impacts are unavoidable, that mitigation measures should be instituted and monitored to limit the adverse influence of the impacts on natural biota and habitats as far as possible. The guiding principle of sound BM is to follow recognized conservation practices so as to limit habitat and species loss associated with any form of development by following the mitigation hierarchy of “AVOID, MINIMISE, MITIGATE”. Since BM is most often called for once a development is approved, total avoidance of impacts is unlikely. Therefore the least that BM must aim to achieve is to minimize or mitigate the effects of the approved development on the natural environment. The above principles and objectives are applied in the rationale of the EMP presented herein with an overall intention to compensate for the residual, unavoidable harm caused by development projects, so as to aspire to no net loss in biodiversity.

The ECO will make recommendations to the Applicant to ensure that the biodiversity is well cared for during the operational phase of the proposed development, in particular with regards to the following:

- Suitable Indigenous Plant Species - Given the conditions of the site, growth of plants will naturally be slow. In addition, many of the naturally occurring plant species are not ornamental in nature. Sourcing of suitable indigenous plant species are to be conducted at local nurseries.
- Rehabilitation Programme - Apart from the footprint of the buildings and other facilities, there will be no need for rehabilitation or re-vegetation.
- Re-Vegetation - Re-vegetation should be conducted by a skilled contractor in conjunction with a trained horticulturalist to ensure that the correct mix of plants is used to simulate natural communities in the few corridors that there will be. Only approved plants and plants that have been rescued from the site should be used in the re-vegetation program.

- Waste Management - No dumping of garden or general refuse is allowed within the proposed development and the necessary rubbish bins be placed for disposal of refuse.
- Safety – Measures be put in place to ensure the safety of the general public.
- Public Complaints - All complaints from the public must be addressed to the Applicant.
- Long-Term Alien Plant Monitoring – A program must be in place whereby alien vegetation clearing is monitored and destroyed.
- Monitoring the EMP - The EMP must be continuously monitored to determine its effectiveness and efficiency.
- Monitoring of Activities Dealt With in the EMP - Records of all activities discussed in the EMP should be kept. These records should include any exceptions that may have been made, problems that were experienced, methods used to rectify problems as well as the final outcome. This information can then be used to determine flaws in the EMP. These flaws would be guidelines or recommendations that are ineffective and inefficient. They would then need to be removed or changed/adapted until they are effective and efficient.
- Monitoring Compliance with the EMP - The same records used for monitoring activities can be used to monitor compliance with the EMP. Records of non-compliance must be kept. These records must include details of the offence, offender and penalty.
- Evaluation and Revising the EMP - It is important to monitor the implementation of this document to determine whether or not the principles and guidelines set out in the EMP are realistic, effective and efficient. The EMP should be revised every five years to accommodate for an ever changing environment. It is the responsibility of the Applicant to ensure that revisions of the EMP is drafted and submitted to the DEA.

In addition, the Applicant will at all times comply with the requirements of the following Eskom Vegetation Guidelines:

- Vegetation Management and Maintenance within Eskom Land, Servitudes and Rights of Way (Ref. No. 240-70172585); and
- Eskom Servitude Life Cycle Management Plan (Ref. No. TRMBPAAB8)