DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME OF THE PROPOSED CONSTRUCTION OF THE MAHIKENG MAIN TRANSMISSION SUBSTATION AND THE 400KV PLUTO-MAHIKENG POWERLINE.

JUNE 2018



Table 1: Document Control

Title	The proposed Mahikeng Main Transmission Substation and the 400kV Pluto-Mahikeng Power line.
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LIST OF ABBREVIATIONS

CE	Consulting Engineers
C	Contractor
NEMA	National Environmental Management Act
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPR	Environmental Management Programme Report
EA	Environmental Authorisation
SS	Site Supervisor

DEA	Department of Environmental Affairs
PM	Project Manager
MTS	Main Transmission Substation
ESKOM	ESKOM Holdings SOC Limited
ELO	Environmental Liaison Officer
CELO	Contractor Environmental Liaison Officer
ELO	Environmental Liaison Officer
WM	With Mitigation
WOM	Without Mitigation

NAMES OF THE CORRIDOR ALTERNATIVES

Alternative Corridor 1 (Green Corridor)

Alternative Corridor 2a (Purple Corridor)

NAMES OF THE SUBSTATION SITE ALTERNATIVES

Site A	Site Alternative 1 (Red Site)
Site B	Site Alternative 2 (Yellow Site)
Site C	Site Alternative 3 (Green Site)

Table 2: Table of Sections Based on the National Environmental Management Act, 1998 (Act 107 Of 1998), and the 2014 EIA Regulations of 08 December 2014, as amended.

Taken from Appendix 4 of The EIA Regulations of 08 December 2014		
Section in Regulation	**Description in EIA Regulation**	**Section in This Report**
An EMPr must comply with Section 24N of the Act and include -		
(a)	**Details of -**	
(i)	The EAP who prepared the report; and	**Appendix A**
(ii)	The expertise of the EAP, including a curriculum vitae;	**Appendix A**
(b)	**A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description**	**Chapter 2**
(c)	**A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site,**	**Chapter 2**

	indicating any areas that should be avoided, including buffers;	
(d)	**A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-**	**Chapter 6**
(i)	Planning and design;	
(ii)	Pre-construction activities;	
(iii)	Construction activities;	
(iv)	Rehabilitation of the environment after construction and where applicable post closure; and	
(v)	Where relevant, operation activities;	
(e)	**(e) indicates omission from existing enactments**	
(f)	**A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved , and must, where applicable, include actions to;**	**Chapter 9**
(i)	Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
(ii)	Comply with any prescribed environmental management standards or practices;	
(iii)	Comply with any applicable provisions of the Act regarding closure, where applicable; and	
(iv)	Comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	
(g)	**The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);**	**Chapter 9**
(h)	**The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);**	**Chapter 9**
(i)	**An indication of the persons who will be responsible for the implementation of the impact management actions;**	**Chapter 9**
(j)	**The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;**	**Chapter 9**
(k)	**The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);**	**Chapter 9**
(l)	**A program for reporting on compliance, taking into account**	**Chapter 8**

	the requirements as prescribed by the Regulations;	
(m)	**An environmental awareness plan describing the manner in which—**	**Chapter 7**
(i)	The applicant intends to inform his or her employees of any environmental risk which may result from their work; and	
(ii)	Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	**Any specific information that may be required by the competent authority.**	

KEY DEFINITIONS

Auditing: A systematic process of objectively obtaining and evaluating evidence regarding the effectiveness and performance of the Environmental Management Programme.

Corrective Measures: A response required to eliminate the occurrence of non-compliance with the requirements of the EMPr.

Environmental Impact Assessment (EIA): A systematic process of identifying, assessing and reporting environmental impacts associated with an activity.

Environmental Impact Report: A report describing the process of examining the environment effects of a development proposal, the expected impacts and the proposed mitigating measures.

Environmental Method Statement: A statement that indicates how compliance with environmental specifications will be achieved, providing a framework for the setting of objectives and targets.

Impact: A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Mitigation Measures: These are the management measures that are used to mitigate negative impacts or enhance positive impacts associated with a proposed project.

Non-conformance: Non-compliance is issued when a transgression of the underlying management measures outlined in this document, relating to the construction, operation or decommissioning of the power lines occurs. A Non-conformance report must be completed setting out corrective actions, responsibilities and timeframes.

Table 3: Project Proponent/Applicant Details

PROPONENT DETAILS	
Company Name	Eskom Holdings SOC Limited
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Table 4: Details of Environmental Assessment Practitioner

ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)	
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For more details about his expertise and experience please refer to **Appendix A**.

SECTION 1: GENERAL INFORMATION

1. INTRODUCTION

ESKOM Holdings Limited (ESKOM) is mandated by the South African Government to ensure the provision of reliable and affordable power to South Africa. ESKOM currently generates approximately 95% of the electricity used in South Africa. Electricity cannot be stored and must be used as it is generated. Therefore, electricity must be generated in accordance with supply-demand requirements. ESKOM's core business is in the generation, transmission (transport), trading and retail of electricity. In terms of the Energy Policy of South Africa "energy is the lifeblood of development". Therefore, the reliable provision of electricity by ESKOM is critical for industrial development and related employment and sustainable development in South Africa.

Baagi Environmental Consultancy cc, as Independent Environmental Assessment Practitioners have been appointed by Eskom SOC Holdings to facilitate the Scoping and Environmental Impact Assessment (EIA) Processes required for the proposed construction of the proposed Mahikeng Main Transmission Substation and the 400kV Pluto-Mahikeng power line.

This Environmental Management Programme report (EMPr) is designed to assist in this objective and to ensure that proper planning is undertaken. This EMPr has also been compiled to provide recommendations and guidelines to which compliance monitoring can be done during the construction of the power line as well as to ensure that all relevant factors are considered to ensure for environmentally responsible development. The EMPr will be strictly implemented during the construction of the proposed Mahikeng Main Transmission Substation (MTS) and the 400kV Pluto-Mahikeng power line and will be reviewed regularly during the lifespan of the project until decommissioning for updating where necessary. It is important to note that this EMPr is a "living" document and must be reviewed on a regular basis.

It is important that better precautions be taken to ensure that project activities do not result in environmental damage and that any environmental impacts are minimised and managed. This will require a concerted effort from the Contractor appointed by ESKOM, as well as by ESKOM itself during operation.

1.1 Background

It is widely accepted that any stage in the project life-cycle of a development can pose various risks to the environment as well as the inhabitants of the surrounding areas. These possible risks must be taken into account during all the stage of the project life-cycle of the development. The purpose of this document is to provide management responses that will ensure that negative impacts resulting from the development are minimised and that positive impacts are enhanced. This EMPr is, therefore, a stand-alone document, which must be used onsite during each phase of the development.

The process that was followed in compiling the EMPr is in compliance with Section 24N of the National Environmental Management Act (Act 107 of 1998) and the Environmental Impact Assessment Regulation as amended. The purpose of this EMPr is to formulate mitigation measures that are legally binding to all developers, contractors and environmental personnel during the planning and construction phase as well as measures that must be implemented during the operational phase.

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

- Scoping Report and Environmental Impact Assessment Report for the proposed construction of the Mahikeng Main Transmission substation and the 400kV Pluto-Mahikeng power line;
- Environmental Authorisation (EA) issued by the Department of Environmental Affairs, (once issued);and
- The Final Walk-down Construction EMPr (once commissioned); and the
- Site-specific construction EMPr

2. PROJECT OVERVIEW

2.1 Study Area

The proposed 400kV transmission power line will be located within the Gauteng and North West Provinces, starting at Pluto MTS near Carletonville, towards North West running in a predominantly north-westerly direction towards Miga, near Mahikeng, where the site of the proposed Mahikeng MTS will be. The footprint for the proposed Mahikeng MTS will be 1km² in extent. The proposed Pluto-Mahikeng transmission line will be approximately 250km in length. Below is a locality map of the study area.

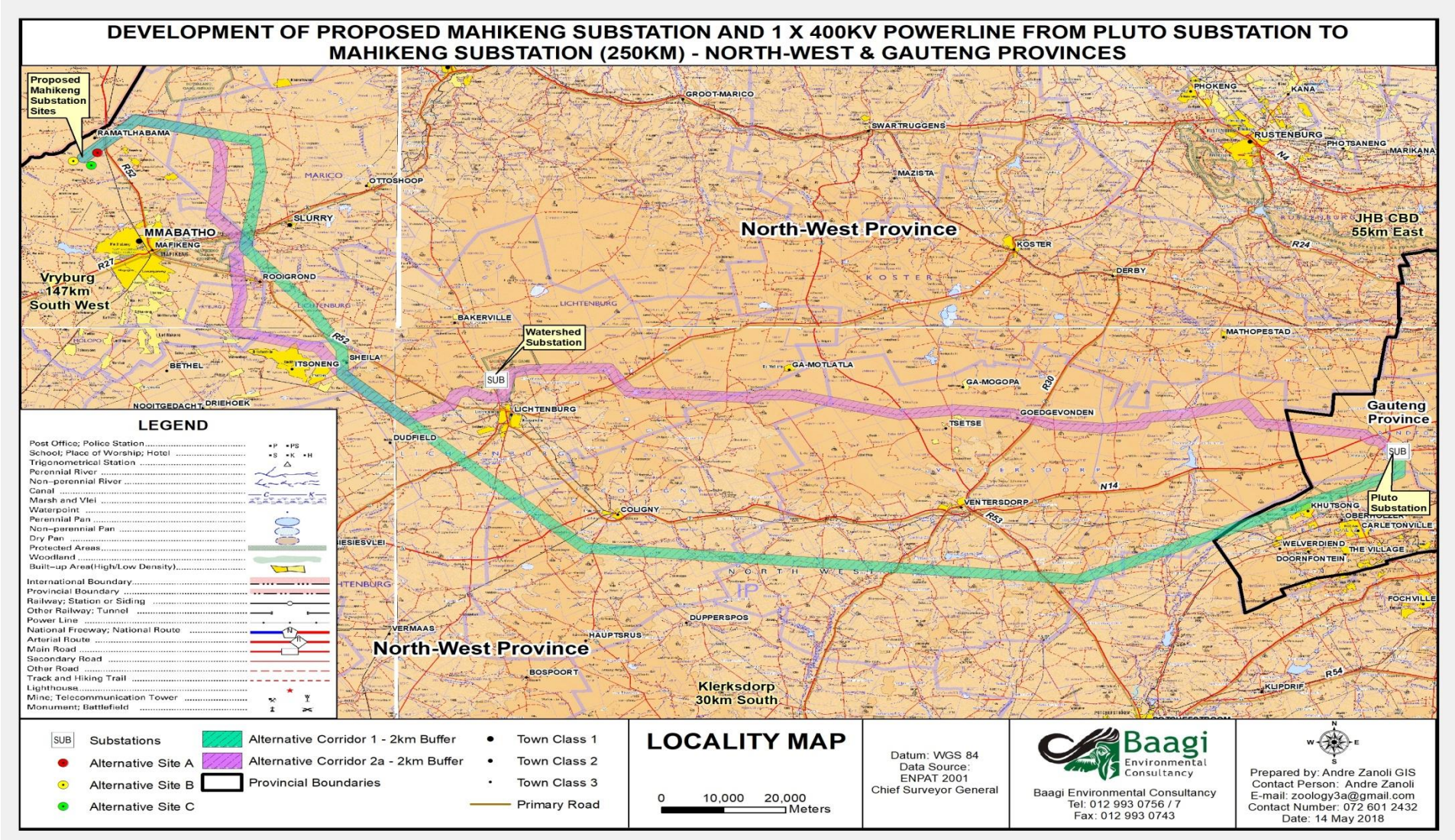

Figure 1: Locality Map of the study area showing the proposed Corridors and MTS sites.

The proposed development affects the following municipalities:

- **West Rand District Municipality**
  - Merafong Local Municipality
- **Dr. Kenneth Kaunda District Municipality**
  - JB Marks Local Municipality
- **Ngaka Modiri Molema District Municipality**
  - Ditsobotla Local Municipality
  - Mahikeng Local Municipality

2.2 Project Description

The proposed 400kV Pluto-Mahikeng Power line and MTS project entails the following:

- Establishing the Mafikeng MTS and design for an end state of 3x 500MVA 400/132kV transformers and 2 of the 500MVA transformers on commissioning;
- Designing for an end state of 8x 132kV and equip 3 of the 132kV feeder bays on commissioning;
- The erection of a communication tower at the Mahikeng Main Transmission Substation;
- The construction of access roads; and
- The establishment of an approximately 250km 400kV transmission powerline from Pluto Main Transmission Substation to the proposed Mahikeng Main Transmission Substation.

3. PURPOSE OF THE EMPr

The main driving force behind the compilation of this EMPr is to outline measures that are to be implemented during the project life-cycle of the proposed development in order to minimise undesirable direct, indirect or cumulative environmental impacts. This is done by encouraging good management practices through planning and complying with all applicable laws, regulations, standards and guidelines for the protection of the environment.

The EMPr serves as a guide for compliance officers, contractors and developers on their roles and responsibilities concerning environmental management on site. Furthermore, it provides a framework for environmental monitoring throughout the development's life cycle.

3.1 Objectives of the EMPr

The objective of this EMPr is to ensure that:

- Environmental management conditions and requirements are implemented from the start of the project,
- Precautions against environmental damage and claims arising from such damage are taken timeously;
- The completion date of the contract is not delayed due to environmental problems with the landowner, communities or regulatory authorities arising during the course of the project execution;
- The asset created conforms to environmental standard required by ISO 14001 and Transmission Policy;
- ESKOM Project manager and Contractor must take into consideration any landowner special conditions,
- Environmental conditions stipulated in the EA, which is still to be issued, are implemented;
- Implementation of this EMPr for the benefit of all involved;
- Preservation of the natural environment by limiting destructive activities on site.

4. LEGAL FRAMEWORK APPLICABLE TO THE PROPOSED PROJECT

4.1 Relevant National Legislation

The Legal Framework highlighted below focuses on the parts of the legislation that have an implication on this project.

4.1.1 The Constitution of the Republic of South Africa Act (Act 108 of 1996)

The Constitution of South Africa is the overarching legislation against which all other legislation is measured. This crucial piece of legislation includes the Bill of Rights (Section 32), which states that everyone has the right to an environment that is not harmful to his or her health or well-being and to have the environment protected for the benefit of present and future generations.

The Act therefore implies that measures must be implemented to:

1. Prevent pollution and ecological degradation.
2. Promote conservation.
3. Secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development.

Furthermore, the Bill of Rights also states that everyone has the right to access –

(a) any information held by the state; and
(b) Any information that is held by another person and that is required for the exercise or protection of any rights.

Relevance to Project

The construction of the 400kV power line and the proposed substation, in accordance with the Constitution, should not be undertaken in a manner that will result in environmental pollution and ecological degradation. Therefore, the design and planning, construction and decommissioning phases should be carried out in a sustainable manner, preventing unjust harm to the environment or human life. Furthermore, the information pertained in this report is available for public scrutiny at any given time throughout the assessment and decision making processes.

4.1.2 National Environmental Management Act, 1998 (Act 107 of 1998)

There are various elements within the National Environmental Management Act (NEMA) that are relevant to the proposed project. The 'polluter pays' concept is enforced to ensure that any party or parties, which undertake(s) any activity that may cause, causes or caused any pollution, must prevent, mitigate or remedy the effects.

Section 2 of Chapter 1 of the NEMA provides details of the environmental management principles that should be adhered to during all phases of the development. These need to be read as a whole, including the following:

- Avoidance/minimisation of the loss of biodiversity.
- Avoidance/minimisation of the disturbance of ecosystems.
- Avoidance/minimisation of pollution.
- Avoidance/minimisation of cultural and heritage sites.
- Avoidance/minimisation/recycling of waste.
- Responsible and equitable use of renewable and non-renewable resources.
- Avoidance/minimisation/mitigation of adverse impacts.

The NEMA also states that there are certain human activities that may have a significant detrimental effect on the environment. For this reason, the Act makes provision for the Minister to – from time to time – announce certain activities that need to be assessed to ascertain their potential environmental impact before these activities may be undertaken. (These activities are called "Listed Activities"). The activities triggered by the proposed Mahikeng MTS and the 400kV Pluto-Mahikeng power line are listed in Table 5 below, the table gives the Government Notice Number under which the activity is triggered, activity number, activity description in terms of NEMA, and the description of the activity itself in relation to that of the description of the activity being triggered.

Table 5: Listed Activities Applied for the Proposed Project

Relevant Notice Activity Number	Activity Description	Relevance to Project
No. 327 item 12:	The development of – (ii) Infrastructure or structures with a physical footprint of 100 square metres or more.	The proposed project will involve construction of a Substation with a physical footprint of approximately 1000000 square metres.
No. 327 item 24:	The development of a road— with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	The proposed project will involve the construction of an access road that is approximately 2 kilometres long and 9 metres wide.
No. 325 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	The proposed project will involve the construction of a 400 kilovolts transmission power line and a substation outside an urban.
No. 324 item 12 (c) (h):	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. **C. Gauteng** i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or	The construction of the proposed transmission line and proposed substation will involve the clearing of vegetation for the final preferred route and site. **C. Gauteng:** (i) According to data sourced from SANBI, vegetation types are regarded as Vulnerable (Sov Highveld Grassland, Klerksdorp Thornveld, Carleton Dolomite Grassland and Mafikeng Bushveld) with Vaal-Vet Sandy and the Western Highveld Sa Bushveld regarded as Endangered. (ii) According to Biodiversity Sector Plan, SANBI

	bioregional plans; or 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. **H. North West** ii. A protected area including municipal or provincial nature reserves as contemplated by NEMPAA or other legislation; iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; v. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or vi. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.	EGIS alternative corridor 1 is least affected by CB CBA 2, ESA 1 and ESA 2. Corridor 2a is mostly affe by the CBA 1, CBA 2, ESA 1 and ESA 2. (iii) Abe Bailey Nature Reserve falls under conservation and protected areas.

No. 324 item 3:	The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) Is to be placed on a site not previously used for this purpose; and (b) Will exceed 15 metres in height- **h. North West** (i)Outside urban areas (aa) a protected area identified in terms of NEMPAA; (bb) sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority. (dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority (ff)Areas within 5 kilometres from protected areas identified in terms of NEMPAA or a biosphere reserve.	(a) and (b) The proposed project will involve the erection of a communication tower, not higher than 55 metres in height where it will be placed on a site not previously used for this purpose. **North West:** (i)(aa) According to the South African Protected Areas Database (SAPAD Q2, 2017) Fred Coetzee Private Nature Reseerve and Somerville Private Nature Reserve fall under protected areas. (bb) The proposed project will involve sensitive area identified in an environmental management framework. According to Biodiversity Sector Plan (2015), SANBI and EGIS alternative corridor 1 is least affected by CBA 1, CBA 2, ESA 1 and ESA 2. Corridor 2a is mostly affected by the CBA 1, CBA 2, ESA 1 and ESA 2. (dd) The proposed project will involve Critical Biodiversity Areas as identified in systematic biodiversity plans. Alternative corridor 1 is least affected by CBA 1, CBA 2, ESA 1 and ESA 2. Corridor 2a is mostly affected by the CBA 1, CBA 2, ESA 1 and ESA 2. (ff) According to the South African Protected Areas Database (SAPAD Q2, 2017) Fred Coetzee

		Private Nature Reseerve and Somerville Private Nature Reserve fall under protected areas.

4.1.3 National Water Act (Act 36 of 1998)

The National Water Act (NWA) is the main legislative piece that controls both private and public water use within South Africa. Section 19 of the National Water Act provides that:

- If there is land where there is an activity or process, which causes has caused or is likely to cause pollution of water resources, the person in control must take all reasonable measures to prevent such pollution from occurring, continuing or recurring.

Pollution is defined as the altering of the physical, chemical or biological properties of water rendering it less fit for anticipated beneficial use or making it potentially harmful to humans, aquatic and non-aquatic organisms, to the resources quality or to property. In accordance with Section 21 of the National Water Act the following are considered as water uses and therefore need to be licensed:

a) Taking water from a water resource.
b) Storing water.
c) Impending or diverting the flow of water in a watercourse.
d) Engaging in a stream flow reduction activity.
e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1).
f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
g) Disposing of waste in a manner which may detrimentally impact on a water resource.
h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.
i) Altering the beds, banks, course or characteristics of a watercourse.
j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
k) Using water for recreational purposes.

Relevance to Project

The Act calls for actions that will prevent and remedy the effects of pollution generated by the operations of a water user and of those that will address emergency incidences. Water uses that are applicable to the construction of power lines and the MTS include:

- Constructing pylons within a watercourse as well as within the drainage area of a watercourse. This would cause an impediment or alteration of the watercourse.
- The taking of water from a watercourse for construction purposes.
- The accidental spillage and/or purposeful discharge of hazardous substances and/or waste generated during construction and decommissioning phases, into a watercourse or disposed in such a way it may be detrimental to a water resource.

If the abovementioned water uses are undertaken during either the construction or decommissioning phase of the development, A General Authorisation (accompanied with a risk assessment matrix) will need to be applied for at the Department of Water and Sanitation. The Department has exempted all Eskom power line projects because Eskom's mitigation measures have been found to be effective in minimising impacts.

4.1.4 National Heritage Resources Act (Act 25 of 1999)

This Act is concerned with the protection of the Heritage Resources. Section 38 of the National Heritage Resources Act specifically focuses on the management of these resources; furthermore, Section 36 of the National Heritage Resources Act states that:

> (3) Any person who discovers archaeological or paleontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.
>
> (3)(a) No person may, without a permit issued by South African Heritage Resources Agency (SAHRA) or provincial heritage resources Authority -
>
> (a) destroy, damage, alter, exhume, or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) Bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

Relevance to Project

A Heritage Resource Permit from SAHRA will be required for the disturbance, removal or destruction of any heritage site, archaeological site or paleontological site, burial ground, grave, or any public monument or memorial that may be affected by the proposed project. The use of existing old farm houses, older than 60 years, for offices or other facilities within the construction camps, may require a Heritage Resource Permit if any alterations are undertaken to the building.

4.1.5 National Environmental Management: Biodiversity Act (Act 10 of 2004)

The Biodiversity Act chapter provides for the management and conservation of South Africa's biodiversity within the framework of NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was established. The Biodiversity Act chapter 3, 7 and 8 further require landowners to manage and conserve South Africa's biodiversity for current and future generations. The National Spatial Biodiversity Assessment classifies areas as worthy of protection based on their biophysical characteristics, which are ranked according to priority levels.

Relevance to Project

The proposed power lines and substation should be aligned in a manner that avoids threatened or protected ecosystems, and should not use any plants categorised as either a weed or an invasive plant in the undertaking of mitigation, preventative or rehabilitation measures. Protected species found within the servitude and individual tower positions are to be taken into consideration and the respective Protected Trees Removal Permit and Indigenous Vegetation Clearing Permit should be applied for prior to the commencement of indigenous vegetation clearing activities.

4.1.6 National Environmental Management: Air Quality Act (Act 39 of 2004)

Chapter 4 of the National Environmental Management: Air Quality Act provides for the management of air quality in South Africa. It also works towards reforming the law regulating air quality in order to protect the environment by providing reasonable measures for the prevent of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.

Relevance to Project

The construction of the power line and the MTS will cause the generation of emissions and dust, which is governed under the regulations stipulated in the NEM: AQA. The activities that will cause dust include movement of vehicles and excavation.

4.1.7 National Environmental Management: Waste Act (Act 59 of 2008)

The National Environmental Management: Waste Act is the main legislative piece that aims to consolidate waste management within South Africa. Part 2 of the Waste Act details the general duty in respect to the management of waste by the holder of the waste. In accordance to Section 16(1) of the Waste Act, a holder of waste must, within the holder's power, take all reasonable measures to:

a) avoid the generation of waste and where such generation cannot be avoided to minimise the toxicity and amounts of waste that are generated;

b) reduce, re-use, recycle and recover waste;

c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;

d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;

e) prevent any employee or any person under his or her supervision from contravening this Act; and

f) Prevent the waste from being used for an unauthorised purpose.

Relevance to Project

The NEM: WA requires classification of the waste that will be generated from construction and decommissioning activities associated with the proposed project. Methods for reduction, re-use, recycling and recovery of the waste should be followed as well as specific requirements set out within the act for the storage, collection and transportation of waste and the use of authorised methods for the treatment, processing and disposal of the waste.

4.1.8 National Environmental Management: Protected Areas Act (Act 59 of 2003)

The main objective of this Act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. It is also for the establishment of a national register of all national, provincial and local protected areas. The act serves as a tool for management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas.

Relevance to Project

Certain parts of the proposed project will be constructed within protected areas (for e.g Sommerville Private Nature Reserve and Fred Coetzee Private Nature Reserve). The construction activities, therefore, will have to be undertaken with consideration to the any standards and regulations stipulated within the NEM: PAA.

4.1.9 Conservation of Agricultural Resources Act, 1983 (Act No. 84 of 1983)

The Act provides for the utilisation of natural agricultural resources in the Republic of South Africa in order to promote the conservation of soil, water resources, vegetation and the combating of weeds and invader plants.

Relevance to Project

This act ensures that no plants categorised as either a weed or an invasive plant in the undertaking of mitigation, preventative or rehabilitation measures that are associated with construction and/or decommissioning activities.

4.1.10 National Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)

The National Minerals and Petroleum Resources Development Act (MPRDA) make provision for equitable access to and sustainable development of the mineral and petroleum resources within South Africa.

Relevance to Project.

The proposed project will be constructed within Afrisam and PPC operations. The MPRDA regulates the construction of any infrastructure within mining areas and therefore certain requirements, stipulated within the Act will need to be taken into consideration.

4.2 Other Relevant Legislation or Policies Applicable to Eskom

4.2.1 Eskom Act, 1987 (Act No. 40 of 1987)

The Act sets out the objectives of Eskom, being the provision of a system by which the electricity needs of the consumers must be satisfied in the most cost effective manner, subject to resource constraints and the national interest. The National Energy Regulator of South Africa (NERSA) exercises control over the performance of Eskom's functions and the execution of its powers and duties. The functions, powers, and duties of Eskom are set out in Section 12 of the Act.

4.2.3 National Energy Act, 2008 (Act No. 34 of 2008)

The aim of this Act is to ensure that the diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors; to provide for energy planning, increased generation and consumption of renewable energies, contingency energy supply, holding of strategic energy feedstock and carriers, adequate investment in, appropriate upkeep and access to energy infrastructure; to provide measures for the furnishing of certain data and information regarding energy demand, supply and generation; to establish an institution responsible for promotion of efficient generation and consumption of energy and energy research; and to provide for all matters connected herewith.

4.2.5 Fencing Act, 1963 (Act No. 31 of 1963, as amended by Act 108 of 1991)

The Act regulates matters with regard to boundary fences of farms and makes provisions for the erection, alteration, maintenance, damage and repairs. It also spells out the rights of owners or lease holders where the land is subject to certain servitudes and outlines procedures for settling of disputes due to wilful actions including leaving gates opened and unauthorised entry to private land.

4.3 Municipal Development and Planning Frameworks

It is important to note that there are other documents that provide the Environmental Assessment Practitioner (EAP) with guidance when conducting an EIA. These include the Integrated Development Plans (IDPs) of the various municipalities and Eskom Transmission Development Plans (TDPs).

5. PROJECT RESPONSIBILITIES

ESKOM Holdings SOC Limited

The ESKOM Team is responsible for ensuring that the development is implemented according to the requirements of the EMPr. Although the ESKOM Team appoints specific role players to perform functions on their behalf, this responsibility is delegated. The ESKOM Team is responsible for ensuring that sufficient resources (time, finances, human, equipment, etc.) are available to the other role players (e.g. the ECO, CELO and contractor) to efficiently perform their tasks in terms of the EMPr. The ESKOM Team is liable for restoring the environment in the event of negligence leading to damage to the environment.

The ESKOM Team must ensure that the EMPr is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMPr. The ESKOM Team must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental and social aspects relating to the development.

Contractor

Eskom will appoint a contractor who will have to implement the conditions the EMPr conditions. The contractor must be thoroughly familiarised with the EMPr requirements before coming onto site and must request clarification on any aspect of this document, should they be unclear.

The contractor must ensure they have provided sufficient budget for complying with all EMPr conditions at the tender stage. The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site engineer in terms of the EMPr.

Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the ESKOM Holdings SOC Limited as an independent monitor of the implementation of the EMPr and monitor environmental compliance. The ECO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMPr and other licences and/or permits and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management;
- Undertaking routine monitoring and identifying a competent person/institution to be responsible for specialist monitoring, if necessary; and
- The ECO has the right to enter the site and undertake monitoring and auditing at any time, including ensuring compliance with health and safety requirements that are applicable to the site (e.g. wearing of safety boots and protective head gear).

The ECO will be also be responsible for conducting the environmental induction-training course in order to provide the site Employees with an understanding of ESKOM's policies regarding safety, health and environmental issues. This will include the overall objective of the EMPr and its roles and responsibilities. The typical environmental induction-training course must include:

- A site induction;
- Emergency incident and response training;
- Familiarisation with site environmental controls;
- Specific environmental training for relevant Employees; and
- Convey areas of environmental sensitivity to the attention of Employees and also procedure with regard to these areas.

Liaison with Authorities

The ECO will be responsible for liaising with the National Department of Environment (DEA). The ECO must submit monthly environmental reports and quarterly audit reports to the authorities. These environmental and audit reports must contain information on the contractor and ESKOM's levels of compliance with the EMPr.

The audit report must also include a description of the general state of the site, with specific reference to non-compliance. The ECO is to recommend corrective action measures to eliminate the occurrence of the non-compliance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to Appendix B) must be kept on a continual basis.

Liaison with Contractors

The ESKOM's EO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors with the necessary corrective action to be taken.

Contractor Environmental Liaison Officer (CELO)

The contractor must appoint an Environmental Liaison Officer (CELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the CELO for the contractors' attention and subsequently, CELO liaise with the main contractor for his or her attention. The CELO must be permanently on site during the construction phase to ensure daily environmental compliance with the EMPr and must ideally be a senior and respected member of the construction crew.

6. THE PROJECT PROCESS AND PHASES

The detailed and overall process that is undertaken for the planning, construction and operation of the proposed project is as follows:

1. *Scoping Phase:* The Scoping Report has been submitted to the Department of Environmental Affairs for the acceptance of the Scoping study of the proposed project.

2. *Environmental Impact Assessment:* The EMPr is further submitted together with the EIAR to the Department of Environmental Affairs. After approval and the issuing of an EA, the EMPr will be refined through development of a site-specific construction EMPr.

The point of departure for this EMPr is to take a practical approach, through addressing potential problems before they occur, thereby providing corrective measures that will be required during the construction and operational phases of the development. In particular, this EMPr deals with the following phases, as detailed below:

- **Planning and Design Phase**

This section provides guidelines on the mitigation of impacts identified. The impacts that were identified because of the proposed development need to be managed and mitigated as per the recommendations of this EMPr.

- **Pre-Construction Phase**

This section usually provides guidelines on pre-construction activities including site establishment and clearance; environmental induction and training and awareness, site access and health and safety;

1. *Negotiations for the servitude:* ESKOM will initiate a negotiation process with various landowners situated within the project area to discuss issues pertaining to servitude acquisition. During the negotiation process, special landowner conditions will be discussed and agreed to with the property owners. These special landowner conditions will be detailed in the site-specific construction EMPr, which is a product of the walk down process.

2. *Preliminary placement of the Corridor profile:* Once the agreements to register the servitude with the respective landowners are successful, the Surveyors will prepare a preliminary corridor profile.

3. *Walk-down Process:* The walk down process is a pre- requisite activity for the design and negotiation process, whereby specialists are appointed to undertake detailed surveys of the proposed 400kV power line corridor. The Specialist team will comprise of an Avi-fauna and Fauna; Floral; Watercourse; Heritage practitioners.

4. *Final profiles for construction:* The information generated from the walk-down process will be issued to the design engineers to generate a final profile of the power line equipment.

5. *Erection of campsites for the Contractors' workforce:* The appointed Contractor will have to negotiate with respective landowners in order to acquire land for the establishment of the campsite. The campsite will be used for the duration of the construction phase and thereafter it has to be cleaned and rehabilitated and the land evacuated.

6. *Negotiations for and construction of access roads to the servitude:* ESKOM and the respective landowners will agree on the access roads including the access points to be used by ESKOM to gain entry to the servitude through the landowner's properties.

7. *Servitude gate installation to facilitate access to the servitude:* Gates will be installed at the agreed upon points of entry at each property.

8. *Bush clearing: to facilitate access, construction and the safe operation of the MTS and power line:* Vegetation cover will have to be removed to facilitate access, construction and the safe operation of the MTS and the approximately 250km long 400kV power line.

- **Construction Phase**

The final outcome of this EMPr, after the issuing of an EA, is to provide a broad-strokes guideline as a point of departure for the subsequent compilation of the site-specific construction Environmental Management Plan (CEMPr). The bulk of the impacts during the construction phase will have immediate effects (e.g. noise, dust and water pollution). If the

site is monitored on a continual basis during this phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated accordingly in conjunction with a commitment to sound environmental management from the ESKOM Team.

1. *Transportation of equipment, materials and personnel:* The equipment and materials to be used for construction are transported. The personnel will also be transported to the construction camp site.

2. *Installation of towers:* Soil types and trial pits at each foundation point will be done to determine foundation requirements. Thereafter, the foundations will be excavated to the required depth and steel reinforcement and concrete will be used to reinforce and stabilise them.

3. *Final inspection of main transmission substation and power line:* Once the construction of the MTS and power line is completed it will be tested to ensure it functions correctly.

4. *Rehabilitation of disturbed areas:* Excess material and equipment is removed from the project area and the campsites. The disturbed environment is returned to a condition close to its original state.

5. *Signing off Landowners:* ESKOM's internal procedures prescribe that landowners sign off a release form confirming that the land was rehabilitated accordingly. There is a one-year guarantee on contractors' work during which all rehabilitation work must be completed.

6. *Handing and taking over of the servitude:* The ESKOM Transmission head offices will check if the structures are operating properly and that all rehabilitation works implemented are done accordingly.

- **Operational Phase**

The section of the EMPr usually provides guidelines on the operational phase of the development. By taking pro-active measures during the construction phases, potential environmental impacts emanating during the operational phase will be minimised. This,

in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

1. *Operation and maintenance of the MTS and power lines:* On-going maintenance will be performed periodically throughout the operational life span of the MTS and power line.

- **Decommissioning phase**

This section is included in this EMPr in the event that the proposed activity requires decommissioning.

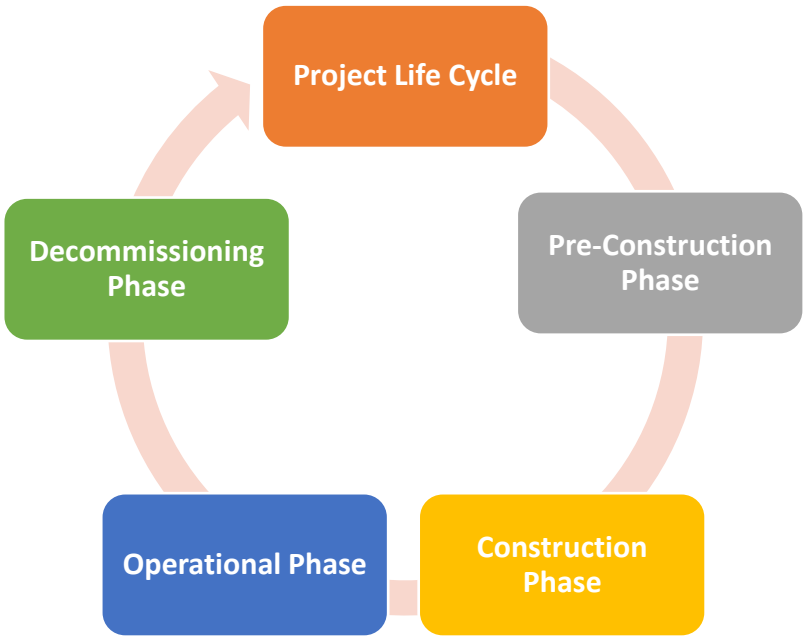

Figure 2: Project Life Cycle

7. ENVIRONMENTAL MONITORING AND AUDITING

A monitoring programme must be in place to not only ensure compliance with the EMPr through the contract / work instruction specifications, but also to monitor any environmental issues and impacts, which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required.

As part of the contract or work instruction, the developer will stipulate the period and the frequency of monitoring required. This will be determined from applicable permits and authorisations from authorities. The PM will ensure that the monitoring is carried out. The monitoring programme will include:

- Environmental audits will be conducted by the ECO during the construction and operational phases of the proposed MTS and the 400kV power line.
- Compilation of an audit report with a rating of the compliance with the EMPr. This report will be submitted to the relevant environmental authority. The ECO must keep a photographic record of the proposed MTS and the 400kV power line before and after construction.

7.1. Compliance with the EMPr

- A copy of the EMPr must be kept on site during the construction period at all times. The EMPr will be made binding to all construction related activities and must be included as Contractual Clauses in any contractual agreement between the proponent and Contractor. It must be noted that in terms of the National Environmental Act 1998 (Act No. 107 of 1998), (Section 28) those responsible for Environmental Damage must make provision for any costs associated with remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health (“polluter pays principle”).
- All persons employed by the contractor will abide by the requirements of the EMPr.
- Contract conditions to include measures (punitive and/or remedial) to be taken in the event of construction employees found to be in breach of any of the specifications contained within the EMPr.

- The Contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMPr.
- In the event where the Contractor might contravene any of the specifications contained in the EMPr, the proponent's PM will, in writing, inform the Contractor of the incident of non-compliance, promulgate corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty or indicate that work must be suspended in the event where non-compliance continues.
- In the event where non-compliance continues, further written notification will be forwarded to the Contractor of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties or instruct that work be suspended.
- The ECO must notify the DEA in writing, within 24 hours (or as the EA may specify) thereof if any condition of the EA is not adhered to.

7.2. Non-Conformance and Corrective Action

The Contractor is deemed not to have complied with the EMPr if:

- There is evidence of contravention of clauses within the boundaries of the site, site extensions and haul/access roads;
- Environmental damage ensues due to negligence.
- The contractor fails to comply with corrective or other instructions issued by the proponents Environmental Officer within a specified time.
- The Contractor fails to respond adequately to complaints from the public, and or stakeholders.

The Developer is deemed not to have complied with the EMPr if:

- There is evidence of contravention of clauses within the boundaries of the site.
- Environmental damage ensues due to negligence.
- The developer fails to respond adequately to complaints from the public.

7.3. Penalties for Non-Compliance

The penalty imposed will be per incident unless stated otherwise in the project specification, the penalties imposed per incident or violation will be determined in consultation with DEA and depending on the severity and/or regularity of the incidence occurring. The following incidents will be finable:

- Failure to demarcate working servitudes.
- Working outside of the demarcated servitude.
- Failure to stockpile materials in designated areas.
- Pollution of water bodies (including increased suspended solid loads).
- Failure to control Stormwater runoff.
- Failure to provide adequate sanitation.
- Failure to remove waste off site to a registered waste disposal facility, and retain Waste Manifests for the same.
- Failure to reinstate disturbed areas within the specified time-frame.
- Any other contravention of a project specific specification.
- Poor housekeeping including water wastage, untidy site.

7.4. Training and Environmental Awareness

It is important to ensure that the contractor has the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm.

Training needs must be identified based on the available and existing capacity of site personnel (including the contractors) to undertake the required EMPr management actions and monitoring activities. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard

The environmental training is aimed at:

- Promoting environmental awareness;
- Informing the contractor of all environmental procedures, policies and programmes applicable;

- Providing generic training on the implementation of environmental management specifications; and
- Providing job-specific environmental training in order to understand the key environmental features of the construction site and the surrounding environment.

Training must be done in a verbally with slide presentations. The training will be a once- off event; however the contractor must make provision for weekly training or Toolbox Talks. In addition to training, general environmental awareness must be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This ensures that environmental accidents are minimised and environmental compliance maximized.

8. REPORTING PROCEDURES

8.1 Documentation

The following documentation must be kept on site in order to record compliance with the EMPr. An Environmental File which includes:

- Copy of the EMPr;
- Copy of the Environmental Authorisation;
- Copy of relevant legislation;
- Environmental Policy of the contractor
- Environmental Method statements compiled by the contractor
- Non- conformance Reports;
- Environmental register, which must include:
  - Communications Register- including records of complaints, and, minutes and, attendance registers of all environmental meetings.
  - Monitoring Results- including environmental monitoring reports, register of audits, Non-Conformance Reports (NCR)
  - Incident book- including copies of notification of emergencies and incidents, this must be accompanied by a photographic record.
  - Waste manifests.
- Material Safety Data Sheets for all hazardous substances;
- Notification of Emergencies and Incidents.

8.2 Environmental Register

The proponent must put in place an Environmental Register; the contractor will ensure that the following information is recorded for all complaints/ incidents:

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

- Additional corrective or remedial action taken and /or to be taken to address and to prevent re-occurrence the complaint/incident.
- Procedures to be undertaken and/ or penalties to be applied if corrective or remedial actions are not implemented.
- Copies of all correspondence received regarding complaints/incidents.

The above mentioned records will form part of integral part of the contractor's records. These records will be kept with the EMPr, and will be made available for security requested by the proponent.

8.3 Environmental Emergency Response

The Contactor's environmental emergency procedures must ensure appropriate responses to unexpected/ accidental actions/ incidents that could cause environmental impacts. Such incidents must include:

- Accidental discharges to water (i.e. into the water course) and land
- Accidental spillage of hazardous substances (typically petrol, oil, and diesel)
- Specific environmental and ecosystem effects from accidental releases or incidents.

The Environmental Emergency Response Plan is separate to the Health and Safety Plan as it is aimed at responding specifically to environmental incidents and must ensure and include the following:

- Construction employees must be adequately trained in terms of incidents and emergency situations;
- Details of the organisation (i.e. manpower) and responsibilities, accountability and liability of personnel;
- A list of key personnel and contact numbers;
- Details of emergency services (e.g. the fire department / on-site fire detail, spill clean-up services) must be listed;
- Internal and external communication plans, including prescribed reporting procedures;
- Actions to be taken in the event of different types of emergencies;
- Incident recording, progress reporting and remediation measures to be implemented; and

- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

The contractor must comply with the environmental emergency preparedness and incident and accident-reporting requirements as per the relevant legal requirements.

8.4 Method Statements

It is a statutory requirement to ensure the wellbeing of employees and the environment. To allow the mitigation measures in this document to be implemented, task-specific method statements must be developed for each set of tasks.

A Method Statement details how and when a process will be carried out, detailing possible dangers/risks, and the methods of control required:

- Type of construction activity;
- Timing and location of the activity;
- Construction procedures;
- Materials and equipment to be used;
- Transportation of the equipment to / from site;
- How equipment/material will be moved while on site;
- Location and extent of construction site office and storage areas;
- Identification of impacts that might result from the construction activity;
- Methodology and/ or specifications for impact prevention / containment;
- Methodology for environmental monitoring
- Emergency/ disaster incident and reaction procedures (required to be demonstrated); and
- Rehabilitation procedures and continued maintenance of the impacted environment.

The Contractor will be accountable for all actions taken in non-compliance of the approved Method Statements. The contractor must keep all the Method Statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

As a minimum the following Method Statements will be required to be generated:

- Dust;
- Environmental awareness course(s);
- Environmental monitoring;
- Erosion control;
- Personnel and public safety;
- Solid and liquid waste management;
- Rehabilitation of modified environment(s)

8.5 Responsibility of the Role Players

Developer

The Developer is responsible for ensuring that the development is implemented according to the requirements of the EMPr. Although the ESKOM Team appoints specific role players to perform functions on their behalf, this responsibility is delegated. The Team is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the contractor) to efficiently perform their tasks in terms of the EMPr. The Team is liable for restoring the environment in the event of negligence leading to damage to the environment.

Contractor

The contractor, is ESKOM's agent on site, and therefore is bound to the EMPr conditions through its contract, and is responsible for ensuring that it adheres to all the conditions of the EMPr. The contractor must be thoroughly familiarised with the EMPr requirements before coming onto site and must request clarification on any aspect of these documents, should they be unclear. The contractor must ensure they have provided sufficient budget for complying with all EMPr conditions at the tender stage. The contractor must comply with all orders (whether verbal or written) given by the ECO, PM or site engineer in terms of the EMPr.

Environmental Consultant Officer

The ECO's duties must include, inter alia, the following:

- Reviewing Method Statements;
- Advising the Contractor and / or supervisor on environmental issues within defined areas;

- Undertaking periodic site visits to ensure compliance with the EMPr and verifying that environmental impacts are kept to a minimum throughout the activity;
- Completing environmental checklists during site visits;
- Keeping a photographic record of progress on site from an environmental perspective;
- Assisting the Contractor in finding environmentally acceptable solutions to problems;
- Recommending additional environmental protection measures should this be necessary;
- Assisting the Engineer or Supervisor in ensuring that the necessary environmental authorisations and permits have been obtained;
- Ensuring that DEA is informed of work progress on site;
- Reporting any incidents that may or have caused damage to the environment or breaches of the EMPr to DEA;
- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the EMPr;
- Advising on the removal of person(s) and/or equipment not complying with the specifications ; and

The ECO must visit the site before and after proposed activities. Thus to ensure an adequate evaluation and or audit is done to reflect the contractors performance towards compliance of the EMPr.

SECTION 2

9. ENVIRONMENTAL MANAGEMENT PROGRAMME

The following tables form the core of this EMPr for the construction and operational phases of the development. These tables must be used as checklists on site, especially during the construction phase. Compliance to this EMPr must be audited monthly and once immediately following completion of construction. This must be followed up with annual audits for a period of two years during the operational phase.

Table 6: Environmental Management Programme for the Proposed Construction of MTS and the 400kV Power Line (Construction Phase)

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
Appointment and Duties of ECO	• The Developer must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the EMPr.	• Developer	• Monitor monthly.
	• The Developer must provide the contractor and sub-contractors with a copy of the EMPr.	• Developer	• Once-off
	• The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMPr.	• ECO	• Continuous
	• The ECO must form part of the project management team and where possible attend all relevant project meetings.	• ECO	• Continuous
	• The contractor must ensure that the contractors and sub-contractors attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.	• Contractor, ECO	• Once-off
EMPR	• This EMPr must be made binding to the main contractor as well as individual sub-contractors and must be included in tender documentation for the construction contract.	• Developer	• Once-off

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
Environmental Awareness Training	• The Contractor must ensure that the construction team and all sub-contractor/s are familiar with the EMPr requirements and have a basic level of Environmental Awareness Training. • The Contractor must undertake Environmental Awareness. • Induction Training prior to the start of any construction activities on site. • Topics to be covered by the training must include: o Explanation of what is meant by "environment" and why the environment needs to be protected and conserved o Awareness of emergency and hazardous spills response provisions; o Prevention of pollution and litter control and the minimization of disturbance to sensitive areas; o Social responsibility during construction. This entails being considerate of local land owners; o Construction Workers need to be made aware that they are not to make excessive noise (e.g. shouting/hooting); o The need for a "clean site" policy also needs to be conveyed to construction workers; • Worker conduct on site which encompasses a general regard for the social and ecological wellbeing of the site and adjacent areas. o No alcohol / drugs to be present on site and no firearms permitted on site or in vehicles transporting staff to / from site, (unless used by security personnel); o Prevention of noise and unsocial behaviour; o Bringing pets on site is forbidden; o No harvesting of fruit or firewood from the site or from areas adjacent to it; o Workers are to make use of facilities provided for them, as opposed to ad-hoc alternatives (e.g. the use of surrounding bush as a toilet facility is forbidden; fires for warmth or cooking are for bidden); o Trespassing on private / commercial properties bordering the • site is forbidden; and o Other than pre-approved security staff, no workers must be • permitted to live on site unless deemed necessary due to the • specific project	• Developer, Contractor, • ECO	• Continuous

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
Sanitation	• The Contractor must install mobile chemical toilets on the site. • Staff must be sensitised to the fact that they must use these facilities at all times. No indiscriminate sanitary activities on site must be allowed. • Pollution of ground and surface water must be avoided • Project workers are not to use rivers for washing or bathing • Ablution facilities must be within 100m from workplaces but not closer than 50m from any natural water bodies or boreholes. There must be enough toilets available to accommodate the workforce. • The ablution facilities must be clearly marked to distinguish between males and females and toilet paper must be provided thereto. • Mobile toilets must be emptied at regular intervals by suitably qualified contractors, according to appropriate health and safety standards. • Mobile toilets must be secured to prevent them blowing over during periods of high winds	• Developer, Contractor	• Continuous
Environmental incidents	• The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves.	• ECO, Contractor	• Continuous
Emergency Preparedness	• If chemicals in sufficient quantity and toxicity have the potential to be released on the construction sites, emergency contingency plans must be prepared as safety measures (Bunded areas). These safety measures must be communicated to the relevant personnel on the construction site. All hazardous installations require a Risk Assessment in terms of the Occupational Health and Safety Act, (Act No.85 of 1993) for construction sites.	• Engineer, Developer, ECO	• Once off

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
Permits and Permissions	• The Developer must ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and ensure that they are strictly enforced /adhered to. • The Contractor must maintain a database of all pertinent permits ○ and permissions required for the contract as a whole and for critical activities for the duration of the contract.	• Contractor, Developer	• Continuous
Waste	• Waste bins onsite must be labelled and waste be disposed as per the labelling thereof. • Waste must be disposed at the licensed municipal waste disposal site.	• Contractor	• Continuous
General	• Prior to establishment of the site camp(s), the Contractor must produce a plan showing the positions of all buildings, laydown yards, and other infrastructure for approval by the ECO/EO.	• Contractor, ECO,EO	• Once-off
	• On completion of Works, the Contractor must clear away and remove from the site all construction paint, surplus materials, foundations, plumbing and other fixtures, rubbish and temporary works of every kind.	• Contractor, ECO/EO	• Continuous
	• All persons employed by the Contractor or his or her subcontractors must abide by the requirements of these General Environmental Protection Specifications. Any employees of the Contractor or his or her subcontractors found to be in breach of any of the General Environmental Protection Specifications must be ordered by the ECO to leave the site forthwith. The order must be given orally or in writing. Confirmation of an oral order will be given as soon as practicable but lack of confirmation in writing must not be a cause for the offender to remain on site. No extension of time will be granted for any delay or impediment to the Contractor brought about by a person ordered to leave the site.	• Contractor, ECO,EO	• Continuous
	• No uncontrolled discharges from the site/working area. All discharge points will require approval from the ECO. Discharges include concrete mixing, vehicle washing etc.	• Contractor, ECO	• Continuous
	• Construction equipment must not move outside the area defined as the site.	• Contractor, ECO	• Continuous

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
	• The site must be responsibly managed to reduce risks to groundwater.	• Contractor	• Continuous
Erosion, sedimentation and flooding	• Construction equipment and machinery must be kept in a demarcated area. The loss of oils and fuel onto the ground must be limited and contained. Where oils have leaked onto the soil, this soil must be removed and either; • Disposed of at an approved dumping site at the end of the construction phase or as required by the ECO. Drip trays must be used to collect oil leaks.; or • Rehabilitated on-site with appropriate rehabilitation chemicals and mixes	• Contractor, ECO	• Continuous
Work area	• The gravel access roads to various points along the proposed route must be no more than 6m wide. • Soil and vegetation to be stripped only from project footprint area. No-go areas (if any) to be clearly fenced off. • Construction camp to be clearly demarcated including all Contractors' buildings lay down areas, etc. • All identified protected tree species must be marked within the project footprint. • All employees must be educated on identifying protected tree species.	• Contractor, Engineer, ECO	• As necessary
Effects of construction camp	• The contactor appointed for the construction of the power line and MTS must set up one site camp. Alternatively the contractor must use a fully serviced site in another location. • The visual impact can be minimized by the creation of a visual barrier. The construction area will be cleared as soon as construction of the infrastructure is finished.	• Contractor, ECO	• Once-off
Crime, safety and security	• Security fence is to be inspected daily to ensure no illegal entry points are created.	• Developer, Contractor	• Daily
	• Do not allow the movement of public within the development site by posting notices at the entrance gates, and where necessary on the boundary fence.	• Developer, Contractor	• Continuous
	• The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993)	• Contractor	• Daily

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
	• Ensure that the handling of equipment and materials is supervised and adequately instructed.	• Contractor	• Continuous
	• Appropriate notification signs must be erected, warning the residents and visitors about the hazards around the construction site and presence of heavy vehicles • Vehicular traffic during construction activities must be limited to a maximum speed limit of 30 km/hr.	• Contractor	• Continuous
Noise pollution	• The development must comply with the local by-laws regarding health and noise.	• Contractor	• Daily
	• Institute noise control measures during construction for all applicable activities and maintain machinery in good working order.	• Contractor	• Daily
	• Construction equipment must only operate between the hours of 07H00 and 17H00 weekdays and Saturdays. Operation is permissible on Sundays and public holidays as per the Contractor's schedule. • Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above.	• Developer, Contractor	• Once off
Atmospheric pollution	• Dust production must be controlled by regular watering of roads and works area, should the need arise.	• Contractor	• As necessary
	• No refuse wastes are burnt on the premises or on surrounding premises.	• Contractor	• Daily
	• All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 30 km/h must be adhered to.	• Contractor	• As necessary
	• Vehicles to be used during the construction phase are to be kept in good working condition so as not to be the source of excessive fumes and nuisance.	• Contractor	• Daily
Visual impact	• Rubble and litter must be removed on a weekly basis and be disposed of at a suitably registered landfill	• Construction crew	• Weekly
	• Advertising on site must be in accordance with South African Manual for Outdoor Advertising Control (SAMOAC).	• Developer	• Continuous
	• The construction camp must be contained to prevent any visual intrusion and be kept in a clean and orderly state at all times.	• Contractors	• Continuous

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
	• The visual impact can be minimized by the creation of a visual barrier. The construction area will be cleared as soon as construction of the infrastructure is finished.	• Contractors	• As required
	• The visual impact of borrow pits can be minimized by the creation of a visual barrier. The Borrow pits can be rehabilitated to further reduce the visual impact.	• Contractors	• As required
Waste	• Rubble must be removed from the construction site and disposed of at a registered Municipal dumping site	• Contractor	• Continuous
	• Sufficient and covered containers must be on the construction site to handle the amount of litter, wastes, and rubbish, debris and builders wastes generated on the site. • All waste skips must be clearly marked. (For example paper, glass and plastic).	• Contractor	• Continuous
	• Containers must be emptied frequently to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard to adjacent properties.	• Contractor	• Continuous
	• No waste must remain on the construction site for more than a month; however, if the waste is in minimal amounts, it must be permissible for the waste to be onsite for longer.	• Contractor	• Continuous
Waste (Liquid)	• All liquid effluent must be disposed of in a manner approved by the Local Authority • Ablution facilities must be available to all workers	• Contractor	• Continuous
Adequacy of waste disposal facilities	• All contracts with subcontractors must contain a clause to the effect that the disposal of all construction-generated refuse/waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMPr.	• Developer, sub-contractors	• Once-off, monitor weekly
	• All solid and chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site.	• Contractor	• Continuous

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
	• Chemical containers and packaging brought onto the site must be removed for disposal at a suitable site. Proof of service must be filed onsite.	• Contractor	• As necessary
	• Burning of waste is not permitted.	• Contractor	• Continuously

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY

Storm Water Management	• Litter blocking storm water system must be removed.
	• Adequate Stormwater Management must be implemented as part of the proposed activity to prevent erosion and sedimentation of the surrounding wetlands, floodplains and rivers:
	  ○ Sheet runoff from access roads must be curtailed; and
	  ○ Runoff from exposed surfaces must be slowed down by strategic placement of berms.
	• The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants.
	• Silt fences must be used to prevent any soil entering the storm water drains.
	• Promote water saving mind set with construction workers in order to ensure less water wastage.
	• New storm water infrastructure construction must be developed strictly according to specifications from ECO in order to ensure efficiency.
	• To prevent Stormwater damage, the increase in Stormwater runoff resulting from construction activities must be estimated and the drainage system assessed accordingly.
	• Hazardous substances must be stored at least 20m away from the buffer area surrounding any water bodies on site to avoid pollution.
	• The installation of the storm water system must take place, to attenuate storm water from the construction as well as the operational phase.
	• Earth, stone and rubble is to be properly disposed of so as not to obstruct natural water path ways over the site. (I.e. these materials must not be placed in storm water channels, drainage lines or rivers).
	• There must be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.
		• Developer and Contractor	• Bi-weekly
			• Continuous

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
Storm Water Management	• If a batching plant is necessary, run-off must be managed effectively to avoid contamination of other areas of the site. Runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. • Cement mixing and batching must be undertaken so not to impact the natural water resources on site. Appropriate measures to prevent runoff escaping from the mixing/batching area must therefore be taken. • Cement must be mixed on an appropriately lined surface. • Waste water from batching operations or ready mix trucks must be discharged into a lined pond or watertight container provided for this purpose. The pond is to be de-sludged regularly, and the cement residue removed from site and disposed of at an appropriately licensed disposal facility. • No water contaminated with cement must be allowed to enter any natural water course or drainage line. • Workers are not to use rivers for washing or bathing. • No human waste will be allowed to enter any water courses or natural drainage lines. • Earth, stone and rubble must not be placed in Stormwater channels, drainage lines or rivers, nor is such material to be excavated. • Further principles that must be followed in terms of temporary Stormwater management on site include: • The avoidance of the use of high velocity Stormwater pipe lines in favour of open, high friction, semi-permeable channels wherever feasible; • The construction of a number of smaller Stormwater outfall points instead of a few large outfall points; • The design of Stormwater outfalls must facilitate reduced flow velocity and minimize and avoid stream banks and soil erosion through design features such as Reno mattresses or splitter blocks.		

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
Storm Water Management	• Similarly, un-channelled flow must be controlled to avoid erosion (i.e. brush packing). • In situations where the surface run-off is concentrated, flow must be attenuated by contouring with hay bales/berms. These must channel concentrated flow into detention/attenuation ponds or areas protected with hay bales for flow minimisation and sediment trapping. Furthermore, physical measures that must be taken to prevent Stormwater pollution include: • Where necessary, rock pitched diversion ditches or berms are to be used to divert water runoff away from exposed soil or construction areas. Silt fences must also be used; - Separate Stormwater collection areas and interceptors at fuel storage areas, batching plants and other potentially polluting activities must be constructed; • The use and storage of all materials, fuels and chemicals, which could leach into the ground, must be controlled. • Any residue from spillages must be removed from site by appropriate contractors. Handling, storage and disposal of excess or containers of potentially hazardous materials must be in accordance with the requirements of the adjudicating authority or any other relevant department. • Erosion gullies and rills within the construction site must be rehabilitated immediately and the root cause of the erosion dealt with immediately.		

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
Excavation	• The topsoil cleared must be retained. The topsoil contains most of the inorganic matter, decomposed organisms and nutrients, thus the removal of the topsoil constitutes a major loss in terms of ecosystem function. In order to ensure that the minimal amount of soil is removed with vegetation clearance, it is strongly advised that vegetation be harvested as close to ground level as possible before earthworks machinery is utilised. Soil removed in this manner will contain the existing seed bank, stolons, rhizomes and runners as well as an additional supply of organic matter that will be beneficial during the early stages of vegetation reinstatement. Harvested grass must be retained and used as a mulch to combat erosion. • Topsoil and subsoil must be placed on opposite sides of the trench and must be kept separate throughout construction and rehabilitation. • Topsoil must not be stockpiled for an extensive period (> 3 months). This is to prevent the redundancy of the existing seed bank as well as the alteration of the soil characteristics • Erect signs and/or danger tape around the exposed excavations to warn the public of the inherent dangers.	• ECO, Contractor	• Once off, monitor weekly
Stockpiling soil	• Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas of the site and not in any storm water run-off channels or any other areas where it is likely to cause erosion or where water would naturally accumulate. • The areas where excavated soil will be stockpiled must be bordered by berms to prevent soil loss caused by rain. • Soil stockpiles must not be higher than 2m	• ECO, Contractor • ECO, Contractor	• Once off • Once off, monitor weekly

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
Groundwater quality	• All areas where hazardous goods are stored must be lined with impermeable plastic sheets underneath to prevent percolation and seepage of the hazardous materials into the groundwater systems. • Drip trays must be used at all vehicle servicing points. • Portable ablutions must be well maintained regularly.	• Developer, Engineer	• As necessary
Hazardous Substances /Materials Management	• The selection of the site for the storage of materials needs to consider the prevailing winds, distance to water bodies and general on-site topography. These areas need to be designated in the Construction Camp layout plan and demarcated and fenced, if necessary. • Hazardous substance storage areas must be secured and safe from access from unauthorised personnel, children and animals. They must be located 100m from any watercourse / wetland and outside of the 1:100 year floodline. • A number of general requirements relating to the use of construction materials must be adhered to, these include: o The mixing of all concrete must occur on a designated, impermeable surface or mixing board; o Lime and other powders must not be mixed during very windy conditions; o Similarly the spraying of herbicides or pesticides must not occur under windy conditions and must comply with OSHA regulations and other chemical handling laws; o All substances required for vehicle maintenance and repair must be stored in sealed containers until they can be disposed of/removed from the site; and o Hazardous substances / materials are to be transported in sealed containers or bags.	• ECO, Contractor	• Continuous
Flow of information	• All communication with the public is to be handled by Councillor or Community Liaison Officer.	• Developer	• As necessary

ACTIVITY / ISSUE	MITIGATION MEASURES	RESPONSIBLE PARTY	FREQUENCY
	• Site inspections are to be conducted by the Developer and contractor as necessary during the course of the works or as agreed by the parties involved. • Operation inspections must occur annually.	• Developer, Contractor	• As necessary
	• The inspections must refer to the implementation of the above-mentioned actions as well as any other matters of concern. • Monthly audits, during the construction phase, must be undertaken to ensure that the EMPr is implemented and sound environmental management occurs in the operational phase. This must be done by the ECO.	• ECO, Representative • Developer • Any relevant party	• Monthly
	• Adjacent land users must be informed in advance of construction activities commencing in vicinity of their properties	• Developer	• As necessary

SOCIAL

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Prior construction of power line and substation	• Engagement with respective owners especially those who have the game farms. This would be to gain their requirements and recommendations that may be specific to the site with regard to the management of the area in the construction phase. • Identification of any unskilled job opportunities that could be advertised in the local settings to benefit people who live in the area. • The formation of an intended time table of which area would undergo construction with respective dates so that could be shared with directly affected stakeholders ahead of the construction phase. • Drafting a Code of Conduct for the Behaviour of employees that would be living in the construction camp for the period of the construction phase. It could address elements of having no guests	• Developer and Contractor	• Once off

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	staying over in the construction camp at any point in time; the effective waste management within the camp, for example.		
Construction of Substation	• An awareness program that could take the form of posters or a meeting could be run in the Miga community educating the adults about the dangers of the substation even if it is enclosed with fencing, as to make the community aware of it. The message could be passed down onto the children by the parents. • The medium used to close in the substation site could be checked that no small bodied person could get through it and that it ensures the protection of the site.	• Developer, Contractor and ECO	• Once-off
Impact on pivot type agriculture within the corridor	• Compensation for the respective farmers from Eskom for the respective servitude. • Deviation within the corridor for the pivots those are able to be deviated.	• Developer, Contractor	• Once-off
Impact on field type agriculture	• Farmers who would lose land due to the servitude would be compensated by Eskom. • Use the space in the corridor that is investigated as a part of the corridor that is not part of the farm, to deviate from the farming activity.	• Developer	• Once-off
Impact on chicken farming	• Use the space in the corridor that is investigated as a part of the corridor that is not part of the chicken farm, to deviate from the chicken farm. • Plans can be put into place to manage to traffic by means of schedules.	• Developer, Contractor	• As required
Impact on Game Farming	• Separate areas where tourists can visit that is a different area to where the power line lines are being set up. This can allow the tourists to see the unaffected parts of the reserve. • Set clear times for access into the property that would allow for there not to be continuous movement in the property. • The areas close to the boundary where the power line section is being constructed would need to be fenced off such that there is	• Developer, Contractor	• As required

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	no loss of game during the construction phase. • Set a designated area where construction workers can work in for the duration of the process.		
Impact of Gatsrand rifle range	• Workers should only be allowed to work during the week on this section and not during the weekend.	• Contractor	• Daily
Impact on the Mafikeng Game Reserve	• Fencing can be put up that separates the area where the workers would be working during the construction phase to allow for the game to be kept in the park. • Dangerous game such as the rhinos could be moved to the central region of the park if necessary. • Workers could be prohibited from moving into the Game Reserve.	• Developer, Contractor and ECO	• As required
Impact on the tourism experience of the Abe Bailey Nature Reserve	• Regulate the areas to which the workers can be in the reserve to try and limit the footprint of the people during the construction phase. • The core seasons where the reserve experiences the most tourists can be accurately identified and an attempt can be made to keep construction out of the high tourism seasons such as school holidays. • Construction would also likely only take place over weekdays which means there would be a lesser effect on the reserve over the weekend period.	• Developer, Contractor and ECO	• As required
Impact on the livelihood of the Khutsong community	• The workers could be prohibited from going near the green belt.	• Contractor	• As required, monitoring
Impact on the Miga community	• It could feature in the code of conduct of the workers working on the project of the power line to stay away from the communities during their working hours as to keep the workers in their areas of work.	• Contractor	• Continuous
Impact on quality of life of Khutsong community residents	• The workers partaking in putting the power line up could be designated to certain areas of the reserve that are away from community members. • It could be a part of the code of conduct of the workers not to go	• Contractor, ECO	• As required, monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	near the community of Khutsong as to respect the community.		
Impact on quality of life of Goedgevonden residents	• Keep the power line as far as possible from the community within the parameters of the 2 km radius that was studied.	• Developer, Contractor and ECO	• Once-off

FLORA

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Ecological Control	• An independent Ecological Control Officer (ECO) should be appointed to oversee construction.	• Contractor	• Once-off, continuous monitoring
Removal of Vegetation	• Areas designated for vegetation clearing should be identified and visibly marked off. • Vegetation clearing in natural areas should be kept to a minimum and restricted to the proposed development footprint only, i.e. the confirmed servitude and access road • Place construction camps in already transformed areas such as cultivated fields or revamping derelict homesteads or other abandoned infrastructure. • New borrow pits must be kept to the minimum; existing one must rather be used than new ones created, if existing borrow pits are not suitable, and new ones are required an application must be lodged with DMR for permitting of such borrow pit. • The visual impact can be minimized by the creation of a visual barrier. The Borrow pits can be rehabilitated to further reduce the visual impact. • No activities should take place during rainy events and at least 2 days afterwards.	• Contractor and ECO	• As required
Harvesting of medicinal plants and wood	• Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the	• Contractor and ECO	• Daily

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	local authority. • Gas and electrical cooking facilities must be provided • Open fires must be discouraged and only used under controlled circumstance, as the area is prone to large fires on a regular basis • Medicinal plants rescued instead of being destroyed and rare or threatened species moved to nurseries for replanting after construction		
Alien vegetation	• Alien invasive species that were identified within the study area and in specific along the final route alignment should be removed prior to construction-related soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. • All alien seedlings and saplings must be removed as they become evident for the duration of construction. • Manual / mechanical removal is preferred to chemical control. • All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.	• Contractor and ECO	• Bi-Weekly, monitoring
Positive impact by removing alien invasive plants	• Compile and implement an alien invasive monitoring plan to remove alien invasive plant species along the chosen route alignments, prior to construction. • Rehabilitate all areas cleared of invasive plants as soon as practically possible, utilising specified methods and species. • Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after construction is complete.	• Contractor	• Prior construction, monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	• Follow manufacturer's instruction when using chemical methods, especially in terms of quantities, time of application etc. • Ensure that only properly trained people handle and make use of chemicals.		
Construction of access roads	• A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs. • Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. • Where possible, existing routes into rugged terrain must be used and enhanced. • If the access roads are required to cross green fields (untransformed) areas, it is strongly recommended that the plants present be surveyed, and collected for documentation. Medicinal plants rescued instead of being destroyed and rare or threatened species moved to nurseries for replanting after construction or used for rehabilitation in areas where construction activities had resulted in the significant loss of natural vegetation. • Formalise access roads and make use of existing roads including farm roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.	• Developer and Contractor	• Once-off, monitoring
Exposure to erosion	• Re-alignment of some of the routes should be considered – especially where routes traverse riverine/wetland vegetation. • Do not allow erosion to develop on a large scale before taking action. • Make use of existing roads and tracks where feasible, rather than creating new routes through grassland areas. • Retain vegetation and soil in position for as long as possible,	• Contractor and ECO	• Continuous Monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	removing it immediately ahead of construction / earthworks in that area. • Runoff from roads must be managed to avoid erosion and pollution problems. • Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed. • Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.		
Destruction of listed and or protected plant species	• The plants of conservation concern should be removed by a suitably qualified specialist prior to construction. This can only be done if authorised by the local conservation authority (GDARD and NWREAD) by means of a permit. Once construction is complete, the plants should be reused as part of rehabilitation of the disturbed areas and replanted from where they were removed. The survival of these plants should be monitored for at least 3 years after rehabilitation. • Where possible, construction activities must be restricted to previously disturbed areas. • Implement a Plant Rescue and Rehabilitation Plan: Where the plants of conservation concern are deemed to be under threat from the construction activity, the plants should be removed by a suitably qualified specialist and replanted as part of vegetation	• Developer, Contractor and ECO	• Prior Construction

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	rehabilitation after the construction (Note, these plants may only be removed with the permission of the provincial authority - permit). • Route deviations that take place after this report should be checked by an ecologist / botanist for presence of plants of conservation concern. • Construction workers may not tamper or remove these plants and neither may anyone collect seed from the plants without permission from the local authority. • Cordon off the sensitive vegetation that house the protected plant species and the plants of conservation concern and protect from construction activities and vehicles. • Slight deviations of access road / pylon alignments must be permitted, so as to avoid plant populations of conservation concern (DWAF, 2005).		
Vegetation Rehabilitation Plan	• A vegetation rehabilitation plan should be implemented. • Grass can be removed as sods and stored within transformed vegetation – remove alien invasive vegetation prior to storing grasslands sods in transformed areas. • Smaller shrubs and bulbs should also be removed and used for rehabilitation. • The plants must preferably be removed during the winter months and be replanted by latest springtime. • The grass sods should not be stacked on top of each other. • Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks.	• Contractor and ECO	• As required

WATERCOURSES

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Loss of watercourse habitat	• Pylon footprints, construction camps, access tracks or quarries should not be constructed within 30m of delineated watercourses, specifically delineated natural watercourses as far as possible. • The proposed Main Transmission Substation should not be located within a 100m of delineated watercourses. • An EMP Walk Down should be undertaken by a wetland specialist once the final route has been selected. The boundaries and types of wetland and other watercourse should be verified and refined during the walk down to help ensure that impacts can be avoided in as many of these features as possible. • The smallest possible footprint should be utilized and positioned as close to the boundary of the affected watercourse as possible, in cases where pylon construction in a watercourse is unavoidable (e.g. in the event of unavoidable long watercourse crossings). • Pylon construction activities in these areas should be completed in the shortest possible time and preferably during the dry season. • Pylons should under no circumstance be located within channels, such as river channels, channels in valley bottom and floodplain wetlands, and drainage lines with clearly defined channels.	• Contractor and ECO	• As required
Changes to the hydrological regime due to infrastructure construction in watercourses	• Restrict the construction of infrastructure in watercourses as far as possible. • Pylon construction in watercourses and their surrounding 0 or 100m buffer zones should only be allowed in exceptional circumstances where these areas cannot be spanned. • The proposed Main Transmission Substation should not be located within a 100m of delineated watercourses.	• Contractor and ECO	• Once-off, monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	• Watercourses and their buffers affected by unavoidable construction activities should be rehabilitated soon after construction. Emphasis should be placed on the reinstatement of the topography to a similar profile as was present pre-construction. • No furrows or drains should be made to channel water from infrastructure. Where this is unavoidable, these furrows and drains need to be closed and re-vegetated as soon as possible. • Construction and access tracks roads should be located outside of watercourses as far as practically possible. • Avoid driving in watercourses during construction phase to prevent vehicle track incision and the potential for channel initiation. Where this is unavoidable in watercourses with channels or wetlands with temporary seasonal or permanent zones of wetness, crossing structures should be in place within affected wetlands and other watercourses. These crossing structures can include the following: • A wearing course (wear surface) should be added as a surface layer on top of geotextile fabrics, which forms base for surface capping of watercourse that are deemed to require a formal crossing structure. • A wearing course (surface cap) of good quality clastic or gravel material also has the potential to reduce surface scour by creating a mix that will easily bind together and minimise detachment of particles. • It may be best not to introduce new material for track creation into certain watercourses, such as indistinct watercourses that lack an entrenched channel or wetlands with only a marginal temporary wetness zone. Site specific recommendations should be made as part of the EMP Walk Down phase, which would also be used to verify the presence and extend of wetlands along the final selected power line route and the proposed substation		

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	footprint. • Geotextiles provide four important functions in temporary road and trail surface construction that includes separation, drainage, reinforcement, and stabilisation. • Geotextiles work as separation fabrics when they are placed between gravel caps and underlying soils to prevent the materials from mixing.		
Decrease in surface water quality	• No refuelling of construction vehicles should occur within 50 m of delineated watercourses. • Hydrocarbons should not be stored within 50m of delineated watercourses. • Use stormwater control measures around construction works where areas have been cleared within watercourses or their buffers, as well as around stockpiles. Sediment traps, such as hay bales or silt traps can be used, but require maintenance throughout the construction phase. • Construction phase stormwater control measures should be applied to pylon construction, vehicle access tracks and the proposed power line and the substation.	• Contractor, ECO	• Continuous
Watercourse erosion	• New headcut and channel features that have resulted during construction should be stabilised once observed. • The implementation of erosion protection measures, such as energy dissipaters, at new formalised vehicle tracks the contain pipes or culverts. • New access tracks should be designed and implemented • During rehabilitation at the end of the construction phase emphasis should be placed on the reinstatement of the topography to a similar profile as was present pre-construction and to create stable and well vegetated surfaces. The separate removal and storage of top soils, as well as the correct reintroduction of top soil (after subsoil has been reintroduced) is	• Contractor, ECO	• Continuous, monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	also important to help create stable surfaces in areas affected by construction.		
Encroachment of alien plant species into watercourses	• Proposed power line infrastructure (e.g. pylons and the Main Transmission Substation) should be located outside of delineated watercourses and their respective buffers to avoid edge effects and opportunity for the encroachment of invasive alien plant species. • Restrict the clearing of watercourse vegetation as far as possible. Areas that have been cleared should be re-vegetated with indigenous species after construction. • Compile and implement an alien plant control program during the operational phase of the project.	• Contractor, ECO	• Continuous, monitoring
Increased sedimentation and erosion	• If the construction of a crossing is unavoidable make sure that substrate continuity in the watercourse is maintained within upstream and downstream portions of the channel bed • Permanent crossing structures across channelled watercourses can include unvented fords that are constructed of riprap, gabions, or concrete to provide a stream crossing without the use of pipes. Water will periodically flow over the crossing • Storm water must be diverted away from the road early and often, so as to reduce the catchment area of the road • Towers in wetlands or other watercourses must not be located on steep slopes, channels or other surfaces with visible erosion features • Road crossings must make provision for dispersed flow and energy dissipation • Management of roadside drainage is the most effective way of controlling sediment runoff from unsealed roads • To minimise sediment load, an unsealed road network must have an emphasis on slowing drainage flows and dispersing them more frequently	• Contractor and ECO	• Continuous

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Encroachment of Invasive alien vegetation watercourses	• Distribution line infrastructure (e.g. towers) must be located outside of demarcated watercourses with a buffer of 50m to avoid edge effects and opportunity for the encroachment of invasive alien plant species • Compile and implement an alien plant control program during the operational phase of the project • Restrict the clearing of watercourse vegetation as far as possible. Areas that have been cleared must be re-vegetated with indigenous species after construction • The contractor must be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion. • The spread of exotic species occurring throughout the site must be controlled. • Early detection and eradication of alien vegetation species through on-going monitoring and eradication programme. • Weeds and alien invasive vegetation must be removed and prevented from spreading into newly disturbed areas or areas recently cleared of vegetation. • Exotic tree species must be replaced with suitable indigenous tree or shrub species. • Materials must not be delivered to the site prematurely which could result in additional areas being cleared or affected. • No vegetation to be used for firewood. • All alien invasive species including species surrounding the site must be removed to prevent further invasion and replaced with indigenous tree, grass and plant species. • Control and manage the removal of vegetation. Vegetation removal to be undertaken in consultation with the ECO • Encroachment of alien vegetation must be monitored regularly	• Contractor, ECO	• Continuous

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	and controlled; the area must be kept clear of all invader plants as per the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983). Rehabilitation measures must be employed until such a time as indigenous species are established. If herbicides are used then correct licenses and permits must be acquired prior to use. • Best practice measures that must be undertaken during clearing include the following: • Cut plants as low to ground as possible. • All alien plants must be removed carefully and exposed soil must be covered with cut vegetation or leaf litter that is free of weed seeds to ensure that regrowth will not occur. • Press any loosened soil down carefully and firmly and mulch with plant material where possible. • All alien seeds, fruit bulbs, tubers and stems must be collected and placed in a sealable container/plastic bag for disposal at a landfill site. • The roots system of mature trees including alien invasive play an important role in stabilising soil and therefore the up-rooting of large mature specimen of trees is not advocated. It is better to fell the trees and paint the stump with the relevant herbicides. • The following must be adhered to: ➢ Hand pulling/ hoeing, hand pulling is most effective with small (30cm), immature or shallow rooted plants. Shake the excess sandy material from the plant, this makes the plant easier to stockpile and lighter to transport. However make sure there is no seed on the plant first to eliminate the spread of seed while shaking. ➢ Chopping/ cutting/ slashing, this method is most effective for plants in the immature stage, or for plants that have relatively woody stems/ trunks. This is an effective method for non-re-sprouters or in the case of re-sprouts (coppicing) it		

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	must be done in conjunction with chemical treatment of the cut stumps. ➢ Cut/slash, the stem of the plant as near as possible to ground level. Paint re-sprouting plants (i.e. Black Wattle, Lantana and Port Jackson willow) with an appropriate herbicide immediately after they have been cut. • Felling, De-branch trees and where possible remove all material. Where possible large trees that are to be felled such that they fall uphill. Cut the tree down as low as possible to the ground. Apply herbicide immediately (no later than 30mins) to the cambium layer. Ensure all the cuts in the cambium layer are treated. • Ring barking, Remove bark in a 30-40cm centimetre band and leave the tree to die. Can be used with or without chemicals but is more successful when herbicide is used. • Rehabilitation ➢ Re-vegetation and rehabilitation Manual must be prepared for use of contractors. Where herbicides are used to clear vegetation, specimen specific chemicals must be applied to individual plants only. ➢ Where the removal of alien species leaves soil exposed, alternative indigenous species must be established before eradication takes place. Individual property owners must be encouraged to plant indigenous non-invasive plants. ➢ All damaged areas must be rehabilitated upon completion of the contract in accordance with ECO satisfaction. • Extra seed must be sown on disturbed areas as directed by the ECO. • Other methods of rehabilitating disturbed sites must also be used at the discretion of the PM to comply with the conditions of the EMPR, e.g. stone pitching, logging, etc. Contour banks must be spaced according to the slopes. The type of soil must also be taken into consideration.		

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	• A mixture of vegetation seed can be used, provided the mixture is carefully selected to ensure the following: • Annual and perennial species are chosen. • Pioneer species are included. • All the species must not be edible. • Species chosen will grow in the area under natural conditions. • Root systems must have a binding effect on the soil. • The final product must not cause an ecological imbalance in the area. • All natural areas impacted during construction must be rehabilitated with locally indigenous grasses typical of the representative botanical unit. • Fragmentation must be kept to a minimum. • Rehabilitation must take place as soon as construction is complete to avoid the edge effect, the infiltration of alien species and soil erosion within the servitude. • Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re seeding.		

FAUNA

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
General	• Where possible, the substation should be positioned in such a way that proposed power lines will be at least 200-300m away from any pan or depression.	• Developer and Constructor	• Once-off
Loss of sensitive habitats units	• A sensitivity map must be used as a decision making tool to guide the layout design of the proposed development - all wetland areas (including man-made areas), upland primary grassland, ridges and outcrops (irrespective of their surface	• Contractor	• Weekly Monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	area) are regarded as sensitive habitat units • Quartzite and dolerite grassland must be avoided to prevent unnecessary damage or disturbances • All recommendations and mitigation measures provided in the Ecological report must be adhered to.		
Disturbances caused during the construction phase	• Extent of the construction sites and access roads must be demarcated on site layout plans and must be restricted to disturbed areas or those identified with low conservation importance • The construction of "new" access roads must be limited, and existing roads must be used during the construction phase • Construction activities must be limited to daylight hours	• Contractor and ECO	• Once-off, monitoring
Increased hunting, poaching and removal of fire-wood	• Harvesting of firewood or any plant material (for medicinal or cultural purpose) during the construction phase is strictly prohibited • Open fires is strictly prohibited and only allowed at designated areas • Hunting/snaring is strictly prohibited • Intentional killing of any faunal species (in particular invertebrates and snakes) must be avoided by means of awareness programmes presented to the labour force • If any subterranean/fossorial reptile, scorpion or mammal species is recovered during the construction phase, this species must be relocated to the nearest area or natural open space with suitable habitat	• Contractor and ECO	• Daily
Loss of conservation important faunal species	• A sensitivity map must be used as a decision making tool to guide the layout design of the proposed development - all wetland areas (including man-made areas), upland primary grassland, ridges and outcrops (irrespective of their surface	• Contractor and ECO	• Weekly, monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	area) are regarded as sensitive habitat units • Quartzite and dolerite grassland must be avoided to prevent unnecessary damage or disturbances • Hunting/snaring is strictly prohibited • Intentional killing of any faunal species (in particular invertebrates and snakes) must be avoided by means of awareness programmes presented to the labour force • If any subterranean/fossorial reptile, scorpion or mammal species is recovered during the construction phase, this species must be relocated to the nearest area or natural open space with suitable habitat.		

AVI-FAUNA

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Loss of habitat and disturbances	• All construction sites must be confined to disturbed areas or those identified with low conservation importance. All construction sites must be demarcated on site layout plans (preferably), and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the construction sites that are not part of the demarcated development area should be considered as "no-go" areas for employees, machinery or even visitors; • A natural buffer zone (to be announced by the wetland specialist) should be allowed between the line	• Contractor and ECO	• Bi-Weekly, monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	servitude and any wetland/river/stream; • All road networks must be planned with care to minimize dissection or fragmentation of important avifaunal habitat type. Where possible, the use of existing roads is encouraged. Access must be determined during the "walk- through" process; • The breeding and roosting status of threatened and near threatened species corresponding to the servitude, in particular birds of prey, vultures, bustards, African Grass-owl and White-bellied Korhaan, should be evaluated prior to construction/decommissioning. If breeding is confirmed, the nest site must be barricaded and appropriately buffered (by at least 200 m or as proposed by the specialist). Construction/decommissioning activities shall only commence once the fledglings are successfully reared and has left the nesting site; • It is recommended that the "cross-rope suspension" type tower be used for the proposed transmission line; • Open fires is strictly prohibited and only allowed at designated areas; and • Killing or poaching of any bird species should be avoided by means of awareness programs presented to the labour force. The labour force should be made aware of the conservation issues pertaining to the bird taxa occurring on the study area. Any person found deliberately harassing any bird species in any way should face disciplinary measures, following the possible dismissal from the site.		
Poaching and trade of	• Killing or poaching of any bird species (in particular cranes)	• Contractor and	• Daily, monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
birds	must be avoided by means of awareness programmes presented to the labour force	ECO	
Collisions	• Areas where bird collisions are likely to be high could be ameliorated by marking the lines with bird devices such as “bird diverters” and “flappers” to increase the visibility of the lines. • It is proposed that all river and dam crossings, including spans proximal to arable land and open bushveld and grassland areas be fitted with "Double Loop Bird Flight Diverters" • Areas with a high probability of providing foraging habitat for flamingos should be marked with nocturnal LED solar-charged devices such the ‘overhead warning light’ produced by Preformed Line Products	• Developer, Contractor	• As required, monitoring
Electrocution	• It is recommended that the “Cross-rope Suspension” tower, a bird-friendly design, be used since it does not provide a suitable roosting or nesting substrate birds, and discourages birds from breeding or roosting on the tower • The use of other towers that do offer perching or nesting habitat, for example the “Self-supporting” (which is commonly used at bend points) and “Guyed-Suspension” towers should be limited and fitted with bird guards • The risk of electrocution is also predicted to become greater at the Mahikeng main substation during the future planning of power lines (especially distribution lines) feeding into the substation.	• Contractor, Developer	• Once-off, monitoring

AGRICULTURE

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Impact on stock farming activities and impact on agricul and irrigation activities	• ESKOM must discuss the construction schedule and activities with the affected farmers to enable them to plan their farming activities and animal movement accordingly • Placement of the line and towers must preferably not impact on income generating activities • Sensitivities with regards to farming practices must be considered • This planning should take into account the presence of irrigation areas and infrastructure. • The development footprint of a transmission line is such that only small areas of land surface are sterilised and it is therefore practically feasible to limit the impacts through proper pylon placement.	• Developer, Contractor and ECO	• Once, monthly monitoring

VISUAL

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Impact on sense of place	• Avoid placing the proposed distribution line within nature reserves and conservation areas • Avoid tourism nodes where possible	• Developer	• Once-off
Visual Intrusion and reduction of open space	• Avoid placing the proposed distribution line within nature reserves and conservation areas • Careful consideration must be given to the type of towers to be used to ensure the least intrusive technology	• Developer and Contractor	• Once-off

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	possible		
Deposition of litter	• No litter, refuse, waste, rubble and builder's waste generated on the premises are to be placed, dumped or deposited on adjacent/surrounding properties including road verges, roads or public places and open spaces during or after the construction period of the proposed development. Refuse must be disposed of at a dumping site approved by the Council. Site cleaning and screening of storm water outlets is essential to prevent large debris from impacting on stream banks downstream of the site. Dustbins must be provided at strategic places within the construction area, and cleared at regular intervals as required to avoid overflow	• Contractor and ECO	• Weekly
Night light	• Security lights in the construction camp are to be angled downwards and into the centre of the site to avoid disturbance to adjoining residents. No tall lighting masts are to be erected or operated during the construction or operational phases	• Contractor	• Continuous

HERITAGE

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Impact on heritage resources	• Given the sensitivity of sub-surface materials (both archaeological and paleontological), a walk down survey must be conducted once the final route selection is concluded • The digging of pylons in the sensitive area should be monitored by Eskom Environmental Practitioner and if any archaeological or paleontological remains are uncovered work must cease immediately and the	• Developer, Contractor and ECO	• Monthly, continuous monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	project archaeologist and SAHRA must be duly informed. • It is also advised that the Archaeology, Palaeontology and Eskom Meteorites Unit are alerted when site work begins. • Strict and clear reporting procedures for chance findings must be followed by Eskom and its contractors throughout the whole period of construction. • Impacts of power lines on heritage can easily be avoided through spanning the electrical cables or conductors over the identified heritage resources • The contractors and workers must be notified that heritage resources might be exposed during the construction work. • In the event where any heritage resources be exposed during excavation, work on the area where the heritage resources were discovered, must cease immediately and the Environmental Control Officer must be notified as soon as possible. • No construction camps, power line towers, access roads or borrow pits must be constructed on a heritage resources without the appropriate permits		

Table 7: Environmental Management Plan for the proposed construction of MTS and the 400kV Power Lines (Operational Phase)

ACTIVITY/ISSUE	ACTION REQUIRED	RESPONSIBLE PARTY	FREQUENCY
Development Maintenance	• All maintenance work must be done in terms of the Occupational Health and Safety Act, (Act No.85 of 1993)	• Developer	• As Required
Dust Impact	• All forms of dust/air pollution must be managed in terms of the NEMA Air Quality Act (AQA) 2004, (Act 39 of 2004); this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions. Under no circumstances must heavy smoke be released into the air • Dust production must be controlled by regular watering of roads and works area, should the need arise. • Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods. • During the transfer of material to stockpiles, drop heights must be minimised to control dispersion of materials being transferred. Stockpiles must be maintained for as short a time as possible and a water spray system implemented to contain windblown particles. Wind breaks could also be used at stockpiles to reduce the erosive forces of the wind. • While being transported, by either road or rail the concentrates must be covered to prevent the spread of dust and particulate matter.	• Developer, Contractor, ECO	• Continuous
Fire Outbreaks	• No open fires must be permitted on site to prevent loss of habitat and risks to fauna. A fire action plan must be in place. All contractors will be informed on the fire fighting strategy.	• Developer, Contractor, ECO	• Continuous

Soil Erosion and Contamination	• Restriction of movement of vehicles, workers or fauna on, or over stockpiles. • To prevent diesel and oil spills, all vehicles and equipment will be kept in good working condition and all leaks repaired immediately. • All generators and vehicles will be placed on drip trays to catch all spills and leaks, while all maintenance work on equipment, vehicles, machinery, etc. will be done over a plastic tarpaulin or steel drip trays. • Maintenance of machinery, vehicles and reticular system must be done regularly. • A drum for the collection of spilled oils and fuels, together with a plastic tarpaulin to catch spills and leaks before they can contaminate soil and underlying groundwater, must be available on-site at all times.	• Developer, Contractor, ECO	• Continuous
Ground water contamination	• Ensure contaminated run-off does not come into contact with surface water or groundwater resources.	• Developer, Contractor, ECO	• Continuous
Noise impact	• All activities on the site must abide by the local noise by-laws. • Construction operations must be limited to daylight (working hours), 07h00 to 17h00. • Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above. • Prior to blasting (if required), the contractor must inform the adjacent landowners at least five days in advance.	• Developer, Contractor, ECO	• Continuous
Visual and aesthetic	• Maintain perimeter fencing in order to ensure that they do not deteriorate and result in an aesthetically unpleasing development. • Prevent unnecessary removal of vegetation outside the width of the working area by clearly demarcating the working area.	• Developer • Contractor	• Continuous • Continuous
	• The proposed project must be kept clean through the	• Developer	• Weekly

	removal of litter on a daily basis. This must be included in a maintenance plan for the development.	• Developer	• Daily
	• Ensure that the garbage is collected on a regular basis.	• Developer	• Regularly

SOCIAL

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Employment opportunities	• Employment opportunities for general maintenance should be prioritized for local people in the area in the respective skill category where it is available. • A database list of people to contact at which sites should be compiled so if there is a component of the power line that would need to be repaired, there is knowledge of the respective stakeholder that would need to be engaged with.	• Contractor	• As required

FLORAL

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Vegetation Rehabilitation Plan	• A vegetation rehabilitation plan should be implemented. • Grass can be removed as sods and stored within transformed vegetation – remove alien invasive vegetation prior to storing grasslands sods in transformed areas. • Smaller shrubs and bulbs should also be removed and used for rehabilitation. • The plants must preferably be removed during the winter months and be replanted by latest springtime. • The grass sods should not be stacked on top of each other. • Once construction is completed, these sods should be used to	• Contractor and ECO	• As required

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks.		

WATERCOURSE

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Watercourse Erosion	• During rehabilitation at the end of the construction phase emphasis should be placed on the reinstatement of the topography to a similar profile as was present pre-construction and to create stable and well vegetated surfaces. The separate removal and storage of top soils, as well as the correct reintroduction of top soil (after subsoil has been reintroduced) is also important to help create stable surfaces in areas affected by construction.	• Contractor, ECO	• Once-off

FAUNA

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Maintenance of the vegetation on the power line servitude	• Where possible, the servitude below the line must be left natural and is not allowed to be burned on an annual basis • Inspections must be carried out at regular intervals to identify areas where erosion is occurring. Appropriate remedial action, including the rehabilitation of eroded areas must be undertaken	• Developer	• As required
Disturbances associated maintenance procedures	• Quartzite and dolerite grassland must be avoided to prevent unnecessary damage or disturbances	• Developer	• As required

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	• Where possible, the servitude below the line must be left natural and is not allowed to be burned on an annual basis • Inspections must be carried out at regular intervals to identify areas where erosion is occurring. Appropriate remedial action, including the rehabilitation of eroded areas must be undertaken		

AVI-FAUNA

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Collisions	• Areas where bird collisions are likely to be high could be ameliorated by marking the lines with bird devices such as “bird diverters” and “flappers” to increase the visibility of the lines. • It is proposed that all river and dam crossings, including spans proximal to arable land and open bushveld and grassland areas be fitted with "Double Loop Bird Flight Diverters" • Areas with a high probability of providing foraging habitat for flamingos should be marked with nocturnal LED solar-charged devices such the ‘overhead warning light’ produced by Preformed Line Products	• Developer, Contractor	• As required, monitoring
Electrocution	• It is recommended that the “Cross-rope Suspension” tower, a bird-friendly design, be used since it does not provide a suitable roosting or nesting substrate birds, and discourages birds from breeding or roosting on the tower • The use of other towers that do offer perching or nesting	• Contractor, Developer	• Once-off, monitoring

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	habitat, for example the "Self-supporting" (which is commonly used at bend points) and "Guyed-Suspension" towers should be limited and fitted with bird guards • The risk of electrocution is also predicted to become greater at the proposed main substation during the future planning of power lines (especially distribution lines) feeding into the substation.		

AGRICULTURE

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Impact on stock farming activities and impact on agricultural and irrig activities	• Farming, agricultural and irrigation activities can continue when the power line is in operational phase.	• Developer, Contractor and ECO	• Once, monthly monitoring

VISUAL

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Impact on sense of place and reduction of open space	• Avoid placing the proposed distribution line within nature reserves and conservation areas • Avoid tourism nodes where possible	• Developer, Contractor	• Once-off

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
	• Careful consideration must be given to the type of towers to be used to ensure the least intrusive technology possible		

HERITAGE

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Impact on heritage resources	• Sensitive area should be monitored by Eskom Environmental Practitioner and if any archaeological or paleontological remains are uncovered work must cease immediately and the project archaeologist and SAHRA must be duly informed. • It is also advised that the Archaeology, Palaeontology and Eskom Meteorites Unit are alerted when site work begins.	• Developer, Contractor, EO and ECO	• Monthly, Continuous monitoring

Table 8: Environmental Management Plan for the proposed construction of MTS and the 400kV Power Lines (Decommissioning Phase)

ENVIRONMENTAL IMPACT	MITIGATION REQUIREMENTS	RESPONSIBLE PARTY	FREQUENCY
Construction Camp	• The implementation of the Environmental Management Plan (EMP) would be critical in the success of the removal of the construction camp in an effective and sustainable manner.	• Contractor, ECO	• As required
Impact on heritage resources	• Sensitive area should be monitored by Eskom Environmental Practitioner and if any archaeological or paleontological remains are uncovered work must cease immediately and the project archaeologist and SAHRA must be duly informed. • It is also advised that the Archaeology, Palaeontology and Eskom Meteorites Unit are alerted when site work begins.	• Developer, Contractor, EO and ECO	• Monthly, Continuous monitoring
Impact on stock farming activities and impact on agricul and irrigation activities	• ESKOM must discuss the decommission schedule and activities with the affected farmers to enable them to plan their farming activities and animal movement accordingly • Sensitivities with regards to farming practices must be considered • This planning should take into account the presence of irrigation areas and infrastructure.	• Developer, ECO, Contractor	• As required
Visual Impact	• The visual impact can be minimized by the creation of a visual barrier. The decommissioning area must be cleared as soon as dismantling of the infrastructure is finished.	• Contractor	• As required

SECTION 3: CONCLUSION

This Environmental Management Programme must be used as an on-site reference document during all phases of this development, and auditing must take place in order to determine compliance with this EMPR. Parties responsible for transgression of this EMPR must be held responsible for any rehabilitation that must be undertaken. Parties responsible for environmental degradation through irresponsible behaviour / negligence must receive penalties.

The EIA process facilitated the identification of relevant and practical mitigation measures, which must be used by the construction team and ESKOM to draw up and respond to Tender documentation. It is thus key to this process that this document be included during tendering to allow all potential bidders for this work to seriously consider and cost for such mitigation. This will ensure that the document receives the necessary buy in that it requires from the outset of the project.

In order to have records of environmental incidences and the handling thereof, it is suggested that incidence logs (refer to **Appendix B**) be filled in by the Environmental Control Officer or Environmental Liaison Officer. The contract manager needs to be informed of such incidences and further actions need to be taken, must the need arise.

APPENDIX A: EAP'S CV

APPENDIX B: EMERGENCY INCIDENTS PLAN

ENVIRONMENTAL INCIDENT LOG				
Date	**Environmental Condition**	**Comments** *(Include any possible explanation for current conditions and possible responsible parties. Include photographs, records etc.)*	**Corrective Action Taken** *(Give details and attach documentation as far as possible)*	**Signature**

APPENDIX C: METHOD OF STATEMENTS

METHOD STATEMENT: Solid Waste Management (SAMPLE)

CONTRACT:…… **DATE**:…….

WHAT WORK IS TO BE UNDERTAKEN? [Give a brief description of the works to be undertaken on site that will generate waste (hazardous and non-hazardous wastes)]: * Note: please attach extra pages if more space is required.

***Insert additional pages as required**

WHERE ARE THE WORKS TO BE UNDERTAKEN? (Where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: …….. **End Date:**…….

HOW IS WASTE TO BE MANAGED ON SITE? (Provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement **Solid Waste Management (contd.)** **(SAMPLE)**

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed) _____ (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed) _____ (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement must be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed) _____ (Print name)

Dated: _____

APPENDIX D: REPORTING AND CORRECTING NON-CONFORMITY

COMPLAINTS RECORD SHEET	
DATE:	**FILE REFERENCE NUMBER:**
COMPLAINT RAISED BY:	
CAPACITY OF COMPLAINANT:	
COMPLAINT RECORDED BY:	
COMPLAINT:	
COMPLAINT RAISED BY:	
•	
ECO'S PROPOSED REMEDIAL ACTION	
•	
•	
ECO **Signature: …….** **Date:……..**	**SITE MANAGER** **Signature: …….** **Date:……**

APPENDIX E: DECLARATION OF UNDERSTANDING BY DEVELOPER, ENGINEER AND CONTRACTOR

DECLARATION OF UNDERSTANDING BY THE DEVELOPERI,

Representing _____

Declare that I have read and understood the contents of the Environmental Management Program for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____