Environmental Management Programme (EMPr) for the proposed construction of the new 88kV Kashan Substation with associated power line and access road to the existing Hekpoort Substation.

Report Prepared for

Eskom Holdings SOC Ltd

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Executive Summary

The purpose of the Environmental Management Programme (EMPr) is to provide the mitigation and management measures required to ensure that social and environmental impacts, risks and liabilities identified during the Environmental Impact Assessment (EIA) process are effectively managed during the construction and operations of the proposed Kashan substation and associated power line connection to the existing Hekpoort substation. The construction of the substations will minimise the voltage and performance constraints and allow for future connections and development in the area.

Summary of principal objectives

The key objectives of this EMPr are to:

- Determine environmental and social impact mitigation and management measures to minimise the impact of the proposed substations and associated power lines;
- Formalise and disclose the programme for the environmental and social management of impacts of the proposed substations and associated power lines;
- Ensure compliance to environmental legislation and guidelines which may be local, provincial and / or national;
- Ensure sufficient resources are allocated on the project budget so that the scale of the EMPr related activities are consistent with the significance of the identified environmental and social impacts of the substations and associated power lines;
- Provide feedback for continual improvement in environmental performance; and
- Provide a framework for the implementation of environmental and social management initiatives.

Key Definitions and Abbreviations Used in this EMPr

Key definitions used in this EMPr are listed in Table 1-1.

Table 1-1: Key Definitions and Abbreviations Used in this EMPr

Term	Definition
C	Construction phase (in mitigation table).
Contractor	Any provider of services, goods or people to Eskom for the purpose of the proposed development. These may directly or indirectly include contractors, sub-contractors, hired labour agencies and consultants. All contracted are required to draft and abide by a contractor specific EMP in line with the EMPr.
DEA	Department of Environmental Affairs.
DWS	Department of Water and Sanitation
Environmental Consultant	An independent environmental consultant with experience in the assessment of environmental impacts associated with the proposed project, identification of appropriate and reasonable mitigation and management measures, and able to draft the EMPr applicable to the management of construction, operation and decommissioning and closure activities.
ECO	Environmental Control Officer: The ECO is appointed by Eskom to ensure compliance to the EMPr and conditions of the EA during construction and provides proof of compliance documentation to the Project Management Team, and authorities, where required.
EIA	Environmental Impact Assessment: The assessment of changes in the environment, whether adverse or beneficial, wholly or partly, resulting from the proposed activities associated with a project.
EA	Environmental Authorisation: allows for the organisation to commence/continue with activities applied for in the EIA process as authorised in terms of Section 24 of NEMA.

Term	Definition
Environmental management	Eskom employees that deal with environmental considerations in the management cycle of the Project, i.e. policy, planning and design, implementation (preconstruction, construction and operation), monitoring and corrective action and review.
EMPr	Environmental Management Programme.
ERP	Emergency response plan
Eskom	Eskom Holdings SOC Ltd
GDARD	Gauteng Department of Agricultural and Rural Development.
IFC	International finance corporation.
Incident	An undesired event that may result in an environmental, although can be managed through internal response and procedures.
I&APs	Interested and affected parties: Any person who is directly or indirectly affected by the proposed project.
NWREAD	North West Department of Rural, Environment and Agriculture Development.
NWPHRA	North West Provincial Heritage Resources Authority
O	Operational phase (in mitigation table).
PC	Pre-Construction phase (in mitigation table)
Project Management Team	The responsibility of the EMPr implementation resides on this team. This team may include a Project Manager and Section Leader and appointed contractors and consultants, including the ECO.
Programme	Identifies a series of interrelated measures (often contained in detailed plans) for managing the environmental effects of the proposed project. A programme provides broad direction and covers more than one project phase.
PPP	Public Participation Programme.
SAHRA	South African Heritage Resources Agency.
SHE	Safety, Health and Environment.
SHE officer	A representative from each contractor, appointed as a Safety Health and Environmental Officer, assisting the construction manager on Safety, Health and Environmental aspects of the project on the construction site.
SRK	SRK Consulting SA (Pty) Ltd.
TOPS	Threatened or Protected Species specified by the NEM: Biodiversity act (2004).

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1 Introduction

1.1 Background

Eskom is in the process of expanding their power supply grid by supplying additional substations to areas in need of additional capacity and supplying electricity to areas with increasing electricity demand in the North West and Gauteng Province.

The proposed project includes the construction of a new substation in Kashan and a power line of approximately 13 km to the existing Hekpoort Substation. The proposed Kashan Substation falls within the Gauteng Province, north-west of Krugersdorp and it is intended to alleviate the power supply demands experienced by Eskom in the area and to provide electrical infrastructure for future development.

The proposed Kashan Substation will occupy a footprint of approximately 1.2 ha and will be connected to the existing Hekpoort Substation via an 88 kV power line which runs approximately 13 km in a north easterly direction from Kashan (Gauteng Province) into the North West Province. There are two proposed alternative routes for the power line which are indicated in Figure 1 below.

It is for this reason that Eskom propose to construct the following infrastructure the detail can be seen in Figure 1-1:

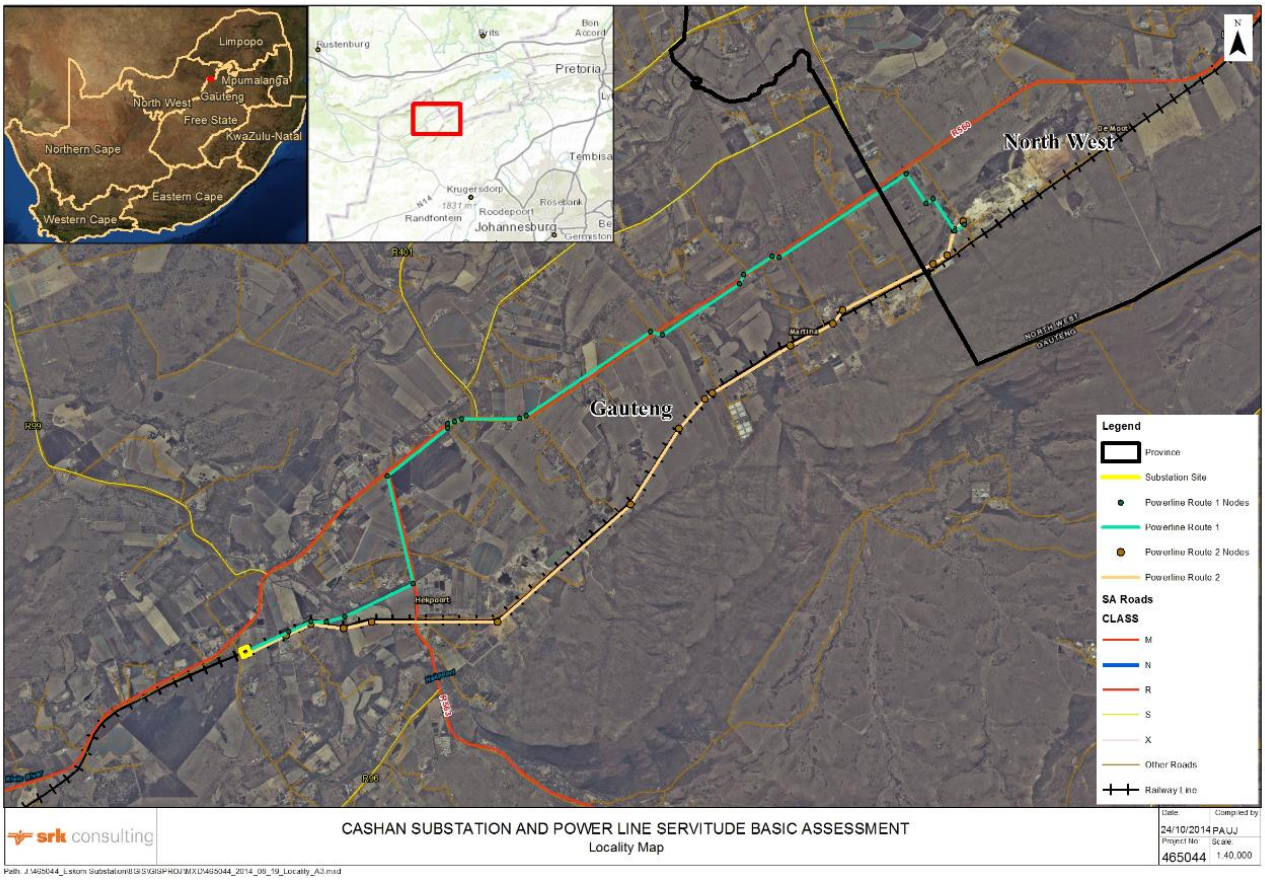

Figure 1-1: The locality of the proposed Kashan substation and associated Powerline alternatives

The purpose of the EMPr is to provide the mitigation and management measures to ensure that social and environmental impacts, risks and liabilities identified during the Environmental Impact Assessment (EIA) process are effectively managed during the construction, operations and closure of the proposed Kashan substation and associated power line. The construction of the substations will minimise the voltage and performance constraints and allow for future connections and development in the area.

The EMPr specifies the mitigation and management measures to which Eskom is committed, should the Environmental Authorisation (EA) be granted, and shows how Eskom will mobilise organisational capacity and resources to implement these measures. The EMPr also shows how management measures aimed at mitigation and enhancement will be scheduled.

1.2 Objectives of the Management Programme for the Substations and Power lines

The key objectives of the EMPr are to:

- Formalise and disclose the programme for environmental and social management;
- Ensure compliance to national and provincial environmental legislation and guidelines.
- Ensure sufficient resources are allocated on the project budget so that the scale of the EMPr related activities are consistent with the significance of project impacts;
- Provide feedback for continual improvement in environmental performance; and
- Provide a framework for the implementation of environmental and social management initiatives.

Good practice , guided by the principals set out in the NEMA (Act 107 of 1998) section 2, require that every reasonable effort be made to reduce and preferably to prevent negative impacts, while enhancing positive benefits, especially within the communities most directly affected by the proposed development. These principles have been guided the EIA process.

The EMPr has been compiled on the basis of the outcome of work undertaken during the EIA process and represents legally binding management commitments of Eskom, should the Environmental Authorisation (EA) be issued by the competent Authorities. The EIA process has involved concurrent and on-going data collection and public consultation activities to date.

Work underpinning the EMPr, which has been compiled in adherence to the EIA regulatory requirements, as prescribed by GN R. 543 dated June 2010, includes the following:

- Public participation programme (PPP) as stipulated in Regulation 54 – 57 of GN R. 543; and
- Preparation of a draft BAR in accordance with Regulation 22 and this EMPr in accordance with Regulation 33 of GN R. 543, for review and comment by Interested and Affected Parties (I&APs).

The EMPr covers information on the management and/or mitigation measures that will be taken into consideration to address identified biophysical, social, and cultural impacts in respect of:

- Pre-construction and Construction activities; and
- Operation; and
- Closure and rehabilitation, where relevant.

It should be noted that the EMPr is a dynamic document that will be periodically reviewed and updated. It will also be necessary to update the version presented in the final BAR during the detailed design phase, prior to the commencement of construction. As part of on-going implementation, this EMPr will also be publicly disclosed during the PPP. An opportunity will be offered to participating stakeholders to comment on it.

1.3 Expertise of Authors of the EMPr

This EMPr was prepared by Fiona Evans and Linda Poll-Jonker under technical guidance of Manda Hinsch, and reviewed by Andy Smithen.

Fiona Evans is an Environmental Consultant with SRK Consulting (Pty) Ltd (SRK). She has an Honours degree in Ecology, Environment and Conservation obtained from the University of the Witwatersrand, and has one years of project experience in environmental management. Fiona has both personally prepared and given input to various EMPrs.

Linda Poll-Jonker is a Senior Environmental Consultant at SRK with over 7 years' experience. Linda has been involved with management and compilation of documentation required for the application processes for Environmental Authorisation under NEMA. She has compiled EIAs and EMPrs in terms of the MPRDA and compiled a number of integrated water use licences applications and integrated water and waste management plans in terms of the NWA.

Manda Hinsch is an Associate Partner and Principal Environmental Scientist with SRK and has 31 years of experience in water quality management, waste management, project management and water and environmental legislation. Manda is a member of the Professional Natural Scientists South Africa and FWISA.

Andy Smithen is a Partner Andy Smithen has been involved in the field of environmental engineering for the past 26 years. His expertise includes: compilation of EIAs and Environmental Management Plans for numerous mines, closure planning and costing, assessment of environmental risk for operating mines and redundant operations, environmental due diligence and liability assessments and environmental auditing. Andy has also been involved in the development of risk based decision-making methodologies and has assisted in the development of water management plans.

The project team collectively possesses the core competence required to prepare the EMPr for the proposed project. For more information pertaining to the qualifications and expertise of the project team, refer to Appendix A.

1.4 Approach to Environmental Impact Management

The responsibility for the implementation of the EMPr will ultimately reside in the Eskom project management team for the proposed substations and associated power lines as representatives of the holder of the Environmental Authorisation (EA). There will be links with other fundamental units such as Safety, Health and Environmental (SHE) officers of Eskom, operational and maintenance services.

The sections that follow outline the management cycle and responsibilities of the Project Management Team. Table 1-1: illustrates the range of approaches to be undertaken to appropriately mitigate and manage potential environmental impacts that have been identified during the EIA Phase of the project, for the construction, operation and decommissioning and closure phases of the proposed substations and associated power lines.

Table 1-1: Approach to Impact Management

Avoidance	Avoiding activities that could result in adverse impacts and/or resources or areas considered sensitive.
Prevention	Preventing the occurrence of negative environmental impacts and/or preventing such an occurrence having negative impacts.
Preservation	The process of working to protect something valuable so that it is not damaged or destroyed i.e. environmental resources)
Minimization	Limiting or reducing the degree, extent, magnitude or duration of adverse impacts through scaling down, relocating, redesigning and/or realigning elements of the project.

Mitigation	Measures taken to minimise adverse impacts on the environmental and social aspects.
Enhancement	Magnifying and/or improving the positive effects or benefits of a project.
Rehabilitation	Repairing affected resources to their original state.
Restoration	Restoring affected resources to an earlier (possibly more stable and productive) state, typically 'background' condition, where identified to be appropriate and reasonable. These resources may include soils and biodiversity.

2 Organizational Structure and Responsibilities

2.1 The Project Management Team

The project management team consists of the project manager, the contractor, the environmental control officer (ECO) and the SHE officer of Eskom. The roles of these team members are discussed under separate sub headings below.

2.1.1 Project Manager

The project manager, assisted by the ECO, will be responsible for the co-ordination of the project management team. With the assistance of the ECO he/she will be required to:

- Familiarise themselves with the EMPr for the substations and associated power lines, and the conditions set out in the EA, and relevant environmental legislation as identified in the Final Basic Assessment Report (BAR). Information packs will be distributed to the Project Management Team by the ECO and transmittal notes will be kept on file.
- Ensure that the contractors are aware of the specifications, legal constraints and Eskom standards and procedures pertaining to activities taking place regarding the proposed substations and associated power lines, by reference to the conditions of the EMPr and EA that have been inserted into their service contract by Eskom;
- Ensure that all commitments/conditions in the EMPr are communicated and adhered to by relevant Eskom employees and contractors involved with the proposed development, by making the documents available to relevant employees and contractors and including the requirements into the induction programme for the proposed substations and associated power lines.

2.1.2 The Contractor (Including Sub-Contractors)

The contractor and sub –consultants will be responsible for the implementation of the contractor specific EMP the Safety Health and Environment (SHE) Plan and Eskom's Emergency Response Plan (ERP) attached in Appendix B. The contractor specific EMP should be guided by a Risk Register informed by Risk Assessments of hazards identified by the contractor to be associated with the day to day tasks during the construction programme.. The contractor specific EMP must be guided by a Risk Register informed by Risk Assessments of hazards identified by the contractor to be associated with the day to day tasks during the construction programme. The SHE Plan and the ERP must be associated with the day to day tasks by the project team and the ECO. The ERP must be appropriate for any potential emergency.

The contractor and all sub-contractors will be responsible for:

- Complying with the EMPr commitments and any other legislative requirements as applicable to the contractors appointment for the proposed substations and associated power lines;
- Drafting a method statement (contractor specific EMP) appropriate to the day to day activities under his direct control. The method statement must abide by the EMPr. The Contractor specific EMP must be agreed upon, by the Project Team representatives and the ECO, for the activities to be undertaken by the contractor;

- the Risk Assessments are agreed to be appropriate for the tasks by the Project Team representatives and the ECO, as appropriate;
- Adhering to any instructions issued by the Project Manager, and/or other designated lead agent administering the contract, on advice of the Eskom environmental specialist and ECO;
- Submitting an environmental report at identified site meetings on the environmental incidents that have occurred within the period between site meetings, and reporting on action to address any incidents previously identified by the contractor or the Project Team, the ECO or Eskom representatives;
- Ensuring that all employees of the contractors, and Eskom employees as may be involved in the construction programme, receive appropriate training prior to the commencement of construction, taking cognisance of this EMPr and the conditions of the EA.

2.1.3 The Environmental Control Officer

An ECO will be appointed to provide ECO inputs during the construction phase of the proposed substations and associated power lines. During the operational phase these functions will be taken over by the SHE Department of Eskom. The ECO will be appointed by Eskom and not the contractor and will report directly to Eskom.

The ECO will:

- Fully understand the commitments in the EMPr and EA for the proposed substations and associated power lines.
- Familiarise him / herself and ensure compliance with the relevant legislation applicable to the project ESKOM SHE Policy and procedures;
- Communicate the contents of the EMPr to the contractor and sub-contractor staff members;
- Monitor the implementation of the EMPr throughout the project, by means of site inspections, reporting to Eskom and the Project Team at progress meetings;
- Undertake site inspections, on a weekly basis, to assess compliance with the EMPr and conditions in the EA and to advise on appropriate action to rectify non – compliances;
- Recommend to Eskom the removal of personnel and / or equipment should they contravene the specifications of the EMPr;
- Liaise with environmental statutory bodies, including Gauteng Department of Agricultural and Rural Development (GDARD), North West Department of Rural, Environment and Agricultural Development (NWREAD), Department of Environmental Affairs (DEA), and Department of Water and Sanitation (DWS), where this is deemed necessary in association with the Project Team and/or Eskom personnel;
- Compile monthly progress reports for submission to the Project Manager; and
- Advise the Project Management Team on environmental issues and recommendations for the proposed substations and power lines construction activities.

2.1.4 The Safety, Health and Environmental Officer of Eskom

The SHE Officer will:

- Monitor to ensure that all aspects of the construction and operation of the proposed substations and power lines comply with the requirements of the SHE plan of Eskom;
- Be responsible for ECO duties during the operation;
- Ensure corrective actions required to address identified impacts are followed up and closed out.

3 The Proposed Substations and Associated Power Lines

3.1 Planning and Design

No impacts have been identified during this phase therefore no management and mitigation measures have been considered for this phase of the proposed development.

3.2 Pre-construction and Construction

The EMPr provides for mitigation and management measures to avoid or minimise negative impacts and optimise the benefits arising from the positive impacts during construction activities. The primary focus on project management for the construction phase will include:

- Communicating the construction programme and activities to Stakeholders prior to activities commencing, particularly community members as they may be affected by the construction activities.
- Delineation of servitudes for the power line route.
- Establishment of contractor camps for site offices, change-rooms, local workshops, vehicle parking, ablutions, materials storage, waste storage, and communications etc.
- Establishment of security measures for the construction activities and the substations and power line routes, including, but not limited to, the construction of palisade fencing for the substations, and fencing and lighting of contractor's operational areas (camp/s and materials storage areas etc.).
- Transportation of equipment and machinery to the construction site locations.
- Stripping and removal of surface vegetation from the substation sites and the designated route of the power line.
- Stripping and stockpiling of topsoil and sub soil from the substation sites and the designated route of the power line to a stockpile/s for later use for rehabilitation and landscaping.
- Grading and earthworks that will be conducted at the substation sites and along the power line construction footprint.
- Sourcing of construction material.
- Construction and commissioning of the substations and power lines according to the agreed programme.
- Development of construction environmental management procedures.
- Transportation of equipment, material, and people.
- Construction of watercourse crossings.
- Erosion control and pollution control.
- Site rehabilitation following the construction phase, of areas that have been disturbed and are not part of the on-going operational phase of the proposed substations and associated power lines.
- Stripping and stockpiling of topsoil and sub soil from the substation sites and the designated route of the power line to a stockpile/s for later use for rehabilitation and landscaping.
- Monitoring and maintenance of rehabilitated areas.

Some potential impacts are difficult to monitor quantitatively, such as soil erosion and waste management. However this on–going, but pragmatic, inspection regime must be developed, and will be updated once the detailed project programme is confirmed. The finalised version must allow for potential environmental transgressions to be identified proactively so that mitigation can be quickly and effectively implemented to an appropriate level.

3.3 Operation

The primary operation of the proposed substations and associated power lines will be to supply and distribute electricity to the Hekpoort area. The primary focus on project management for the operational phase will include:

- Development of operational phase environmental management procedures.
- Operation of the substations and power lines for 24 hours a day under normal circumstances, adjusted according to the operation and maintenance programme for Eskom, and maintenance programme for the substations and power lines.
- Fortnightly inspections of the substations and power lines for anomalies, spillage, vandalisms, copper wire theft etc. as these may affect the operation of the substations and power lines.
- Maintenance and repair of the substations, power lines and associated infrastructure will be undertaken throughout the operational phase according to a designated maintenance programme, as informed by the specifications of the electrical technology supplier, as well as Eskom's existing maintenance and servicing regimes.

3.4 Closure

Due to the permanent nature of the proposed development, a closure and rehabilitation phase is not envisaged. In the event where closure and decommissioning is necessary, rehabilitation must be done in accordance with the relevant guidelines and legislation.

4 Auditing and Corrective Action

Auditing and implementing corrective action, should it be required, forms an important component of the EMPr management cycle. These ensure that:

- The required EMPr management conditions are being implemented, and reported appropriately;
- The desired outcomes are being achieved;
- On–going inspections of operational controls and general state of operation are undertaken and reported appropriately;
- Two internal audits must be undertaken during construction to assess the compliance to the EMPr or to focus on particular performance issues in relation to the conditions of the EA.
- One external audit by an independent practitioner must be undertaken four months after the commencement the construction phase to assess the compliance to the EMPr or to focus on particular performance issues in relation to the conditions of the EA.
- Annual internal audits during the operational phase must be conducted internally in order to assess the compliance to the conditions in the EMPr and the EA.

As noted above, some potential impacts are difficult to monitor quantitatively, such as soil erosion and waste management. However an on–going, but pragmatic, inspection regime has been developed, and will be updated once the detailed project programme is confirmed, that must allow for potential environmental transgressions to be identified proactively so that mitigation can be quickly and effectively implemented to an appropriate level.

There are several mechanisms for implementing corrective action both during construction and operational phases. The main instruments used to address non-compliances are the following:

- Verbal instructions – Minor transgressions to the EA and EMPr by the ECO and Project Management Team;
- Written instructions – To support and formalise verbal instructions by the ECO and Project Management Team;

- Contract Notice – Following a material breach in contract issued by the Project Management Team;
- Directive from Regulating Authority – Following a material non-compliance with the conditions of the EA and the EMPr

5 Site Documentation and Reporting

All non-conformances will be recorded by the ECO and reported to the Project Manager on a monthly basis during the construction phase. Monthly inspections will be undertaken under taken by the Environmental Advisor from SHEQS and the Technical Operator of the infrastructure.

The following documentation will be required to be kept at Eskom:

- Project EA;
- Project EMPr;
- Project Programme;
- Project Risk Register;
- Project SHE Plan;
- Complaints register;
- Environmental Incident Register;
- Audit reports of compliance and non – compliance to EMPr and EA conditions;
- Written corrective action instructions;
- Proof that incidents and non – compliances have been closed out appropriately.

The findings of all inspections and internal audits will be structured into instructive reporting provided to the Project Manager. Corrective actions must be clearly defined as appropriate and reasonable, where required.

Emergency procedures for the management of the proposed development during all phases of operation must be in line with Eskom's relevant ERP.

Within the reporting function a structured review component will be required from the Project Management Team. This review function will assist in prescribing appropriate and reasonable corrective actions, and ensuring their timeous implementation.

6 Monitoring

During the construction phase, the ECO will be responsible for monitoring and inspecting contractors' written records to illustrate compliance with the EMPr. This falls under the inspection role of the ECO.

The aim of the compliance monitoring is to verify that the responsible parties are adhering to the procedures, management conditions, and specifications contained in this EMPr and the conditions set out in the EA. A monthly inspection report will be submitted to the project manager during the construction phase.

The ECO will regularly monitor their programme implementation for the proposed development. This will include the regular monitoring of:

- Control of alien vegetation associated with the cleared power line routes by the contractor;
- The contractors waste management programmes used to manage the generation of waste requiring disposal; and
- Rehabilitation of the construction sites, post construction.

7 Environmental Awareness Plan

On-site training must be provided for all contractors and personnel working on site during Construction and operation. No personnel may be allowed onto site without having been instructed on the requirements of the approved EMPr.

The training must deal specifically with triggers that would require the implementation of mitigation measures contained in the EMPr. These include, but are not limited to:

- Identification of TOPS listed species, both fauna and flora
- Identification of potential heritage resources
- Identification and avoidance of demarcated no-go areas
- Substation site access and security.

8 General Requirements

- Monthly meetings to be held to ensure proper and continuous liaison between Eskom and the contractors to make certain everyone is informed at all times;
- Eskom will compile and implement a physical access plan and the contractor shall adhere to this plan at all times, unless agreed with the Project Manager;
- The contractor must adhere to all conditions of the EMPr that are applicable to the construction phase activities that are the express responsibility of the contractor;
- Eskom must adhere to all conditions of the EMPr that are applicable to the construction phase activities that are the express responsibility of Eskom;
- The contractor will implement Eskom's existing ERP focusing on environmental emergencies including: major hydrocarbon spills, watercourse pollution, extensive erosion, flooding and rehabilitation of no – go areas disturbed as a result of construction phase activities of the proposed substations and associated power lines;
- Implementation of good housekeeping principles;
- Documentation and record keeping of all complaints / incidents and actions taken in line with EMPr requirements;
- Fortnightly site inspections throughout the construction period; and
- The contractor shall not be released from site until the Project Manager in consultation with the ECO has signed off the release documentation and is satisfied with the contractor's adherence to the EMPr.

The general environmental management requirements, with responsibilities and time frames, are provided in Table 9-1.

9 Management Review

The purpose of the management review is for the Project Manager and the Project Management Team to review the EMPr, and to propose measures for improving the performance in the spirit of continuous improvement, and as issues and aspects are identified during the operational phase.

Table 9-1: Environmental Management Programme for the proposed Substations and associated Power line route.

Ref no	Measure, criteria or principles	Monitoring Partner	Time frame	Phase
	General			
1.	An ECO will be appointed who will have responsibility for ensuring compliance with the EMPr throughout the life of the operations.	Eskom Project Manager	Prior to the start of the project	PC
2.	Annual audits will be conducted to ascertain compliance with the EMPr and Environmental Authorisation should it be granted.	ECO	Annually	All
3.	Existing management practices for Eskom's operations must be applied to each proposed substation and associated power line.	ECO	On-going	All
4.	Informal fires by construction or Eskom personnel during any phase of the project will be prohibited.	ECO	On-going	All
5.	Emergency firefighting equipment must be made available at the proposed substations.	ECO	On-going	C/O
	Soil and Land Use			
6.	Soil must only be stripped from areas to be disturbed during construction or maintenance.	Eskom/contractors	When applicable	C/O
7.	It will be ensured that erosion controls are included in the designs of linear infrastructure.	Eskom	During design	PC
8.	Vehicles must be restricted to travelling only on designated roadways, as far away from the wetland areas as possible to limit the ecological footprint of the proposed development activities.	ECO	On-going	C/O
9.	All disturbed areas must be rehabilitated, using stockpiled soil as required. A final rehabilitation plan must be compiled towards the end of the construction period.			

Ref no	Measure, criteria or principles	Monitoring Partner	Time frame	Phase
	Biodiversity			
10.	Compliance in accordance with Eskom's existing Land and Biodiversity Standard (Appendix C) as well as Eskom's Vegetation Management Standard (Appendix C) shall be maintained and monitored on an annual basis.	ECO	Monthly monitoring during construction	All
11.	The extent of the construction site must be demarcated and no vegetation is to be removed outside of this zone.	ECO	Before and during construction	C
12.	Should any of the threatened or protected species (TOPS), identified in the Biodiversity impact assessment, be found during construction; protection must be carried out in accordance to NEMBA (Act 10 of 2004) Chapter 4, Part 2. This will include any amendments or changes to regulations and guidelines pertaining to the protection of TOPS.	ECO	On-going	PC
13.	An alien eradication and management program must be developed. Eradication and monitoring must be undertaken monthly during the construction phase and yearly during the operational phase.	ECO	Fortnightly Or Monthly	C/O
14.	If herbicides need to be used to control the spread of invasive plants, only herbicides approved by the National Department of Agriculture should be used.	Eskom	When applicable	PC/C
15.	No trapping or hunting of fauna must be allowed by construction- or Eskom personnel during any phase of the project.	ECO	On-going	All
16.	Install bird flaps and diverters on the erected power lines to help mitigate the bird collisions with the power lines.	Eskom	During power line alignment	C
17.	River banks and other ecologically sensitive areas must be rehabilitated, in consultation with a specialist, where they have been damaged once construction in that particular area is complete.	ECO	Upon completion of construction or maintenance in an area.	All
	Visual			

Ref no	Measure, criteria or principles	Monitoring Partner	Time frame	Phase
18.	All topsoil removed from the site, prior to construction activities, must be stored for rehabilitation purposes at the site.	ECO	When applicable	PC
19.	The natural vegetation (trees and shrubs) around the site must be retained to provide screening for the construction equipment/vehicles, except where their removal is unavoidable for construction to proceed.	ECO	On-going	C/O
20.	If vegetation is to be cleared on site, erosion control measures must be kept in place to ensure that excessive scarring of the landscape is reduced.	ECO	When applicable	C
21.	Construction activities must be restricted between the hours of 7:30 – 18:00.	Eskom – Project Manager	When applicable	C
22.	Investigation into the establishment of vegetation and/or the construction of man-made barriers between the sensitive viewers and the proposed development (i.e. the proposed substation sites) must be undertaken during the construction and operational phases.	ECO	On-going	C/O
23.	During construction, litter control measures must be kept in place to ensure that the site is maintained in a neat and tidy condition.	ECO	On-going	C/O
24.	During construction, dust control measures must be implemented to ensure that undue interest is not drawn to the site.	ECO	On-going	C
25.	External signage must be kept to a minimum, and where possible must be attached to existing structures, to avoid free-standing signage.	ECO	When applicable	C/O
26.	Low foot level lighting must be used where it is deemed safe.	Contractor	On-going	C
27.	Where possible, lighting must be faced / shielded inward away from the viewers.	ECO/Contractor	On-going	O
	Heritage			
28.	If any new artefacts of archaeological or cultural interest are found, including graves, then the area will be marked and all activities in that vicinity will cease with immediate effect. SAHRA and the North West Provincial Heritage Resources Authority (NWPHRA) will be notified of the finding and operations at that specific site will only continue after the relevant permissions have been granted to do so.	ECO	On-going	All

Ref no	Measure, criteria or principles	Monitoring Partner	Time frame	Phase
29.	The identified graveyard sites (as documented in the Basic Assessment report) must be noted along the proposed power line route must be fenced off with access gates installed.	ECO	Before construction	PC
30.	The location of the identified historical sites (as documented in the Basic Assessment report) must be noted prior to the start of the construction phase and pylons must be positioned so that any impact on the identified historical sites is avoided.	ECO	Before construction	PC
	Surface and ground water			
31.	Construction may not commence without a Water Use License being issued by the Department of Water and Sanitation. Any conditions attached to such			
32.	Adequate storm water management must be incorporated into the design of the power line route and the sub-station site in order to prevent erosion. In this regard special mention is made of the installation of drift fences to capture silt	Eskom	On-going	PC
33.	Provision of appropriate sewage facilities during the construction phase (one toilet for 15 staff members). These must be located within the footprint construction area.	ECO	When Applicable	C
34.	Toilets provided for staff members must be cleaned twice a week.	ECO	Biweekly	C/O
35.	Reinforce banks and drainage features where necessary with gabions, reno mattresses and geotextiles	Contractor	At the start of construction in an active water course.	C
36.	Stripping and clearing of vegetation must ideally be planned to be done during the dry season (March - August).	ECO	During construction	C
37.	Ensure that erosion control measures are included in the method statement for construction of the substations and associated power lines, particularly if stripping and clearing of vegetation is likely to occur during the wet season (September - April)	ECO	Stripping and clearing during the Wet season	C
38.	Spillage or leakage of materials and wastes should be reported to the project manager and cleaned up within 24 hours.	ECO	Within 24 hours of the spillage	C/O
39.	Incidents relating to the contamination of surface water will be communicated to Eskom Management, and then reported to DWA, depending on significance and risk rating.	ECO	Within 2 weeks of the incident occurring	C

Ref no	Measure, criteria or principles	Monitoring Partner	Time frame	Phase
40.	Should any construction activities occur within a 1 in 100 year flood line or within 500 m of a wetland, relevant authorisation should be obtained according to the National Environmental Management Act (NEMA) 107 of 1998 and Section 21 c and i of the National Water Act 36 of 1998.	ECO	When applicable	PC/C
41.	No support structures should be constructed within the riparian areas or within the active stream channel. If at all possible all support structures should be developed above the 1:100 year, or, if that is not possible, above the 1:50 year flood line.	ECO/Eskom	Planning and Design	PC
42.	Wetland areas in the vicinity of construction works must be fenced for the duration of the construction phase and designated a 'no-go' area.	ECO	When applicable	C
43.	During the construction and operational phases of the proposed development, erosion berms should be installed to prevent gully formation and siltation of the riparian resources. The following points should serve to guide the placement of erosion berms: Where the track has slope of less than 2%, berms every 50m should be installed. Where the track slopes between 2% and 10%, berms every 25m should be installed. Where the track slopes between 10%-15%, berms every 20m should be installed. Where the track has slope greater than 15%, berms every 10m should be installed. If appropriate, these specifications can be replaced by Eskom guidelines.	Eskom	If applicable	C
44.	No maintenance or servicing of vehicles will take place on site.	ECO	On-going	C/O
45.	Rehabilitation of disturbed areas must be carried out concurrently with construction as far as possible and disturbed footprint areas must be kept to the minimum necessary			C/O
46.	All construction and maintenance vehicles must be inspected regularly for oil leaks and such leaks repaired before further use of the vehicle. Drip trays must be used to collect spilt oil from vehicles prior to repairs being completed.			
	Waste Management			
47.	Existing waste management practices for Eskom's operations must be applied to each proposed substation and associated power line.	ECO	On-going	All

Ref no	Measure, criteria or principles	Monitoring Partner	Time frame	Phase
48.	Domestic waste generated on the proposed site must be collected by the municipality and disposed at the nearest licensed municipal landfill site.	ECO	Monthly	C/O
49.	No dumping of waste material must be allowed. Litter bins must be provided and must be emptied when full, and then transported to at the nearest licensed Municipal landfill site.	ECO	On-going	C/O
50.	All waste building material must be removed from the site on completion of construction	ECO/Contractor	Upon completion of construction	C/O
51.	Contaminated construction and maintenance waste and clean construction waste must be dealt with separately, and then removed to an appropriately registered waste disposal site.	ECO	Monthly	C/O
52.	Oils, greases etc. must be collected and segregated in temporary storage facilities prior to disposal at a licenced Hazardous Waste Landfill site or collected by oil recyclers. Hazardous storage containers and storage areas must comply with relevant SABS standards.	ECO	Monthly	C/O

Ref no	Measure, criteria or principles	Monitoring Partner	Time frame	Phase
	Traffic			
53.	Warning signs must be erected indicating the presence of construction vehicles along the envisaged routes.	ECO/Contractor	On-going during construction on public roads	C
54.	Vehicles must be restricted to travelling only on designated roadways, as far away from the wetland areas as possible to limit the ecological footprint of the proposed development activities.	ECO/Contractor	On-going	C
55.	Speed limits must be enforced at 30 km/h on the access roads to substations and temporary access routes along the power line servitude.	ECO/Contractor	On-going	C/O
56.	Parking on public roads used for access will be restricted to the extent that this is possible	ECO/Contactor	When applicable	C/O
	Noise			
57.	Construction and maintenance equipment to comply with the standards for construction vehicles as stipulated in the IFC's Environmental, Health and Safety Regulations.	ECO	On-going	C/O
	Air quality			
58.	Dust suppression during construction for Eskom's operations must be applied to each proposed substation and associated power line.	Eskom Project Manager	On-going	PC/C
	Socio-Economic			
59.	Ensure effective communication with the land owners during construction and during site maintenance.	ECO	On-going	All
60.	Ensure transparency over the labour process to ensure that there is no conflict in the community	ECO	When applicable	All
61.	Track all complaints made during the construction period and address them in accordance with the relevant specialist studies. Respond to all complaints.	ECO	On-going	C/O
62.	Speak to all landowners regarding the anticipated use of the land and plan the power line route to	ECO	When	PC

Ref no	Measure, criteria or principles	Monitoring Partner	Time frame	Phase
	minimise the impact of the project on current and future land use and production		applicable	
63.	Where the area cannot be rehabilitated to its original condition within two months of the completion of construction, Eskom or its appointed contractor(s) should provide alternative income/food to the farmer for the time period required for production.	Eskom	When applicable	
64.	Available formal and informal employment opportunities must be made available to local residents and/or service providers.	Eskom	When applicable	C/O
65.	Compensation should be paid by the utility for the right of use over the servitude. This value should be set via negotiation with affected landowners and take into account current norms and practice with regards compensation.	Eskom	When applicable	PC
66.	Compensation for loss of stock or any other damages where negligence by Eskom can be proved must be paid.	Eskom	When applicable	PC

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All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

Appendices

Appendix A: Team CVs

Appendix B: Eskom Management Standards

1. Emergency response plan
2. Biodiversity standard
3. Vegetation standard