



ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT (EMPr) FOR THE PROPOSED DEVELOPMENT OF APPROXIMATELY 14.5KM BERSFORT OF 132KV POWER LINE FROM AN EXISTING GROBLERSDAL SUBSTATION TO THE APPROVED SILIMELA SUBSTATION IN THE ELIAS MOTSOLEDI LOCAL MUNICIPALITY OF SEKHUKHUNE DISTRICT IN THE LIMPOPO PROVINCE.

To be submitted to the:

NATIONAL DEPARTMENT OF ENVIRONMENTAL AFFAIRS

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REPORT DETAILS

Project name: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT (EMPr) FOR THE PROPOSED DEVELOPMENT OF APPROXIMATELY 14.5KM BERSFORT OF 132KV POWER LINE FROM AN EXISTING GROBLERSDAL SUBSTATION TO THE APPROVED SILIMELA SUBSTATION IN THE ELIAS MOTSOLEDI LOCAL MUNICIPALITY OF SEKHUKHUNE DISTRICT IN THE LIMPOPO PROVINCE.

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Table of Contents

DOCUMENT CONTROL	6
1. OVERVIEW OF THE PROJECT	10
<i>1.1 INTRODUCTION</i>	<i>10</i>
<i>1.2 PROJECT DESCRIPTION AND SCOPE</i>	<i>10</i>
<i>1.3 LOCALITY OF THE PROPOSED PROJECT</i>	<i>11</i>
<i>1.4 POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED POWERLINE</i>	<i>13</i>
<i>1.5. Applicable Documentation</i>	<i>15</i>
2. PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME	15
3. PARTIES INVOLVED	16
4. RECORD KEEPING	18
5. COMPLIANCE AND PENALTIES	18
6. AMENDMENTS TO THE EMPR	19
7. ENFORCING THE EMPR	20
8. SIGNING OF THE EMPR	20
9. CONCLUSION	20
10. PROCEDURE	21
<i>10.1 PRE-CONSTRUCTION PHASE</i>	<i>21</i>
<i>10.2 THE CONSTRUCTION PHASE: RESPONSIBILITIES AND GENERAL MATTERS</i>	
21	
10.2.1 The Contractor	21
10.2.2 The Applicant	21
10.2.3 The Environmental Control Officer (ECO)	21
10.2.4 Reporting Structure	22
<i>10.3 ENVIRONMENTAL MANAGEMENT DURING PROJECT PHASES</i>	<i>22</i>
Recommendations	25
Recommendations	25
11. PRE-CONSTRUCTION PHASE	27
12. CONSTRUCTION PHASE	43
• <i>Site Clearing</i>	<i>43</i>
• <i>Site establishment</i>	<i>43</i>
13. POST-CONSTRUCTION PHASE	59
14. OPERATIONAL PHASE	62
15. DECOMMISSIONING PHASE	64

LIST OF FIGURES

Figure 1- 3:	Locality Map	12-13
Figure 4:	Communication channel between ECO, ELO, C and Eskom PM	22

LIST OF TABLES

Table 1:	Table of definitions	7-8
Table 2:	Table of acronyms	9
Table 3:	Table of Project Team.....	11


LIST OF ANNEXURES

- Annexure A:** Staff conduct control and information sheet
- Annexure B:** Acknowledgement Form
- Annexure C:** Locality Map (Size A3)

TITLE AND APPROVAL PAGE

DEA REF NO	14/12/16/3/3/1/1507
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DOCUMENT CONTROL

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REVISION AND AMENDMENTS

DATE	No.	DESCRIPTION OF REVISION OR AMENDMENT
2015/09/02	1	Draft version revision 001
2015/09/15	2	Draft version revision 002
2016/02/01	3	Final version revision 003

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DEFINITIONS

Environmental Management Programme (EMPr)	<p>A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life-cycle of a project. This Environmental Management Plan should preferably form part of Eskom's Environmental Management System and ISO 14001 standard compliance system.</p>
Environment	<p>In terms of the National Environmental Management Act (NEMA) (No 107 of 1998), "environment" means the surroundings within which humans exist and that are made up of:</p> <ul style="list-style-type: none"> • The land, water and atmosphere of the earth; • Micro-organisms, plant and animal life, and • Any part or combination of (i) of (ii) and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
Eskom's Project Manager	<p>The person appointed by the Eskom from time to time to act in the capacity and notified, by name and in writing by the Eskom to the Contractor, to act as required in the contract.</p>
Environmental Control Officer	<p>An individual nominated through the Project Coordinator to be present on site to act on behalf of the Project Coordinator in matters concerning the implementation and day to day monitoring of the EMPr.</p>
Contractor	<p>A person or company appointed by Eskom to carry out stipulated activities</p>
Rehabilitation	<p>Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (where possible) which it was before disruption. Rehabilitation for the purposes of this specification is aimed at post-reinstatement re-vegetation of a disturbed area and the insurance of a stable land surface. Re-vegetation should aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.</p>

Site Manager	<i>The person, representing the Contractor, responsible for all the Contractor's activities on the site including supervision of the construction staff and activities associated with the construction phase. The Site Manager will liaise with the Principal Agent in order to ensure that the project is conducted in accordance with the Environmental Management Plan.</i>
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Table 1: Definitions

ACRONYMS

BAR	<i>Basic Assessment Report</i>
DAFF	<i>Department of Agriculture, Forestry and Fisheries</i>
DWS	<i>Department of Water and Sanitation</i>
DEDET	<i>Department of Economic Development, Environment and Tourism</i>
DEA	<i>Department of Environment Affairs</i>
EAP	<i>Environmental Assessment Practitioner</i>
ECO	<i>Environmental Control Officer</i>
EIA	<i>Environmental Impact Assessment</i>
EIR	<i>Environmental Impact Report</i>
EMP	<i>Environmental Management Plan</i>
EMPr	<i>Environmental Management Programme Report</i>
ESKOM	<i>Electricity Supply Commission</i>
HIA	<i>Heritage Impact Assessment</i>
I&AP	<i>Interested and Affected Party</i>
PPE	<i>Personal Protective Equipment</i>
PPP	<i>Public Participation Process</i>

Table 2: Acronyms

1. OVERVIEW OF THE PROJECT

1.1 INTRODUCTION

Eskom Holdings (SOC) Limited, Limpopo Operating Unit (LOU) 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), Distribution (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.

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 the concerted efforts from the Contractor appointed by Eskom, as well as by Eskom itself during operation of the powerlines. This 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 powerlines 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 Powerlines 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 should be reviewed on a regular basis.

1.2 PROJECT DESCRIPTION AND SCOPE

Eskom Holdings (SOC) Limited Limpopo Operating Unit (LOU) proposes to establish a new 132kV power line to link between an existing Groblersdal Substation to the already approved Silimela Substation. Alternative route 1 is approximately 14.5 km Bersfort of 132kV and is described in pink colour on the map

1.2.1 PROJECT TEAM

The members of MCPM Environmental Consultants that were involved with compiling the EMP are tabulated below.

Name	Qualifications	Experience	Duties
Mr Matodzi A. Silidi	B.Env Sc. PG Diploma in Museum & Heritage stu. M.A Environmental Management	14 years	Senior EAP
Mrs T.R Silidi	BA (Hons) MA Social Impact Assessment. Negotiation	10 years	Public Participation Coordinator
Ms Poppie Mafune	BSc Environmental Science	2 years	EAP

Table 3: Project Team

1.3 LOCALITY OF THE PROPOSED PROJECT

The study area is located about 150km south east of Polokwane and to the northeast of Groblersdal (Elias Motsoaledi Local Municipality, Sekhukhune District Municipality of Limpopo Province, South Africa). The project area can be accessed through N11/ R33 from Mokopane to Groblersdal and through R25 and R26 from Groblersdal to Marble Hall and Bronkspruit. The proposed project is located on the farms Vaalfontein 14 JS, Loskop Noord 12 JS and Klipbank 26 JS within the Elias Motsoaledi Local Municipality of Sekhukhune District, Limpopo Province

Eskom Holdings (SOC) Limited Limpopo Operating Unit (LOU) proposes to establish a new 132kV power line to link between an existing Groblersdal Substation to the already approved Silimela Substation. Alternative route 1 is approximately 14.5 km Bersfort of 132kV and is described in pink colour on the map. The proposed power line starts from an existing Groblersdal Substation at GPS coordinates S25°10'04.57"E29°22'52.59" and connect with already approved 132kV power line at GPS coordinates S25°06'06.54" E29°20'07.00" that will join the already approved Silimela substation.

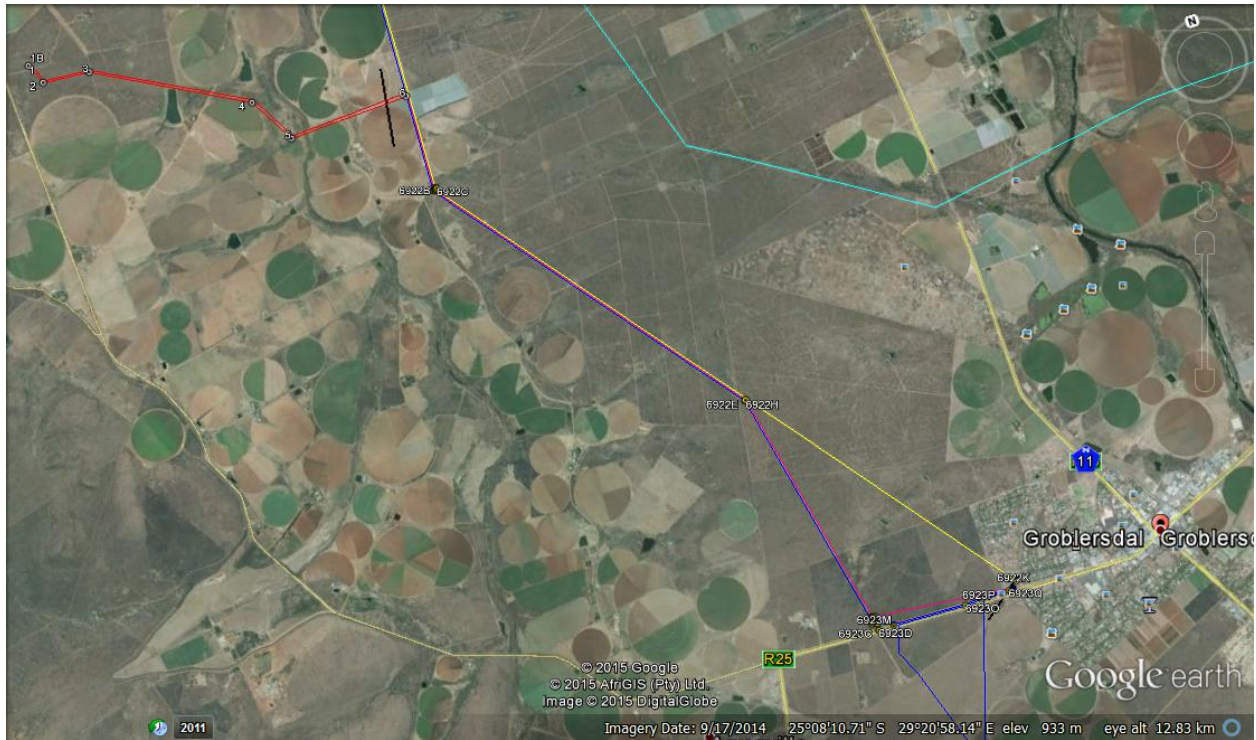


Figure 1: Locality map of proposed development

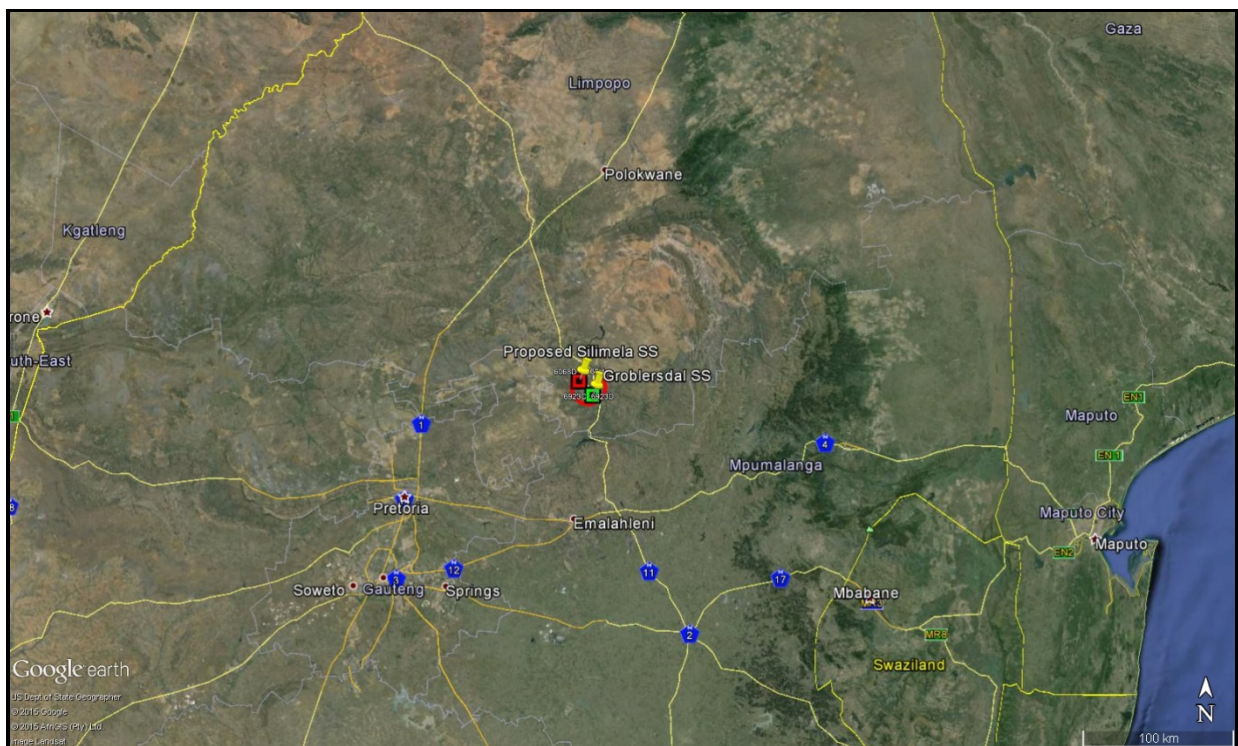


Figure 2: A Regional map showing the approximate location of the study area (red circle).

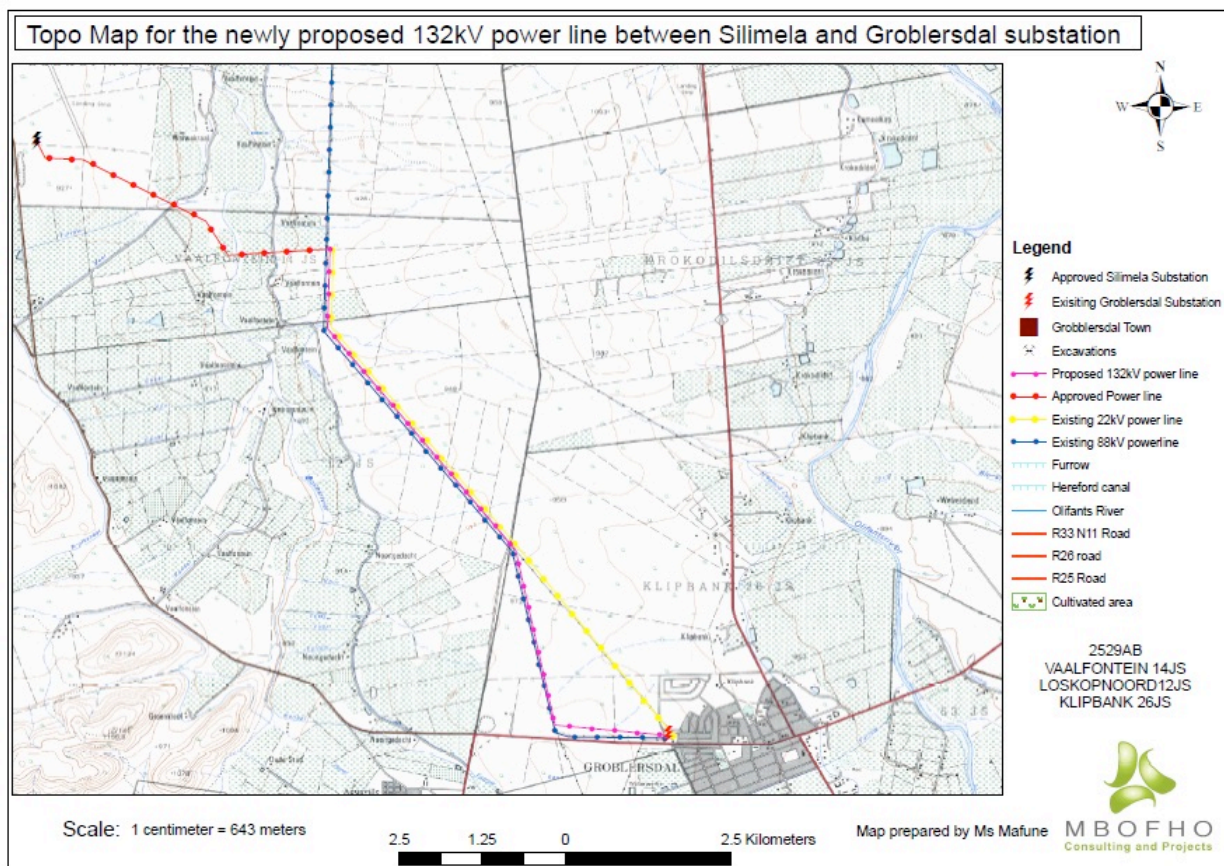


Figure 3: Locality map (Topo map) of proposed development

1.4 POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED POWERLINE

Specialist findings were assessed and summarized in the Basic Assessment Report. Potential environmental impacts associated with the proposed distribution powerline are expected to occur during the construction and operational phases. Some of the identified potential impacts and recommended mitigation measures in the specialist studies are summarized below:

- **Vegetation and Fauna impacts** are due to the disturbance of habitats within the powerline servitude and the tower footprints. Mitigation measures should take the form of preventing construction of towers in / on ecologically sensitive areas including the streams and drainage lines.
- **Avifauna impacts** are as a result of collisions of birds with powerlines and habitat distraction during construction phase. To minimize this impact would require marking the

earth wires of the proposed powerline with bird flight diverters on the earth wire of the line, five metres apart, alternating black and white. Poles should be fitted with bird perches on top of the poles to draw birds away from insulators.

- **Wetland impacts** are as a result of changing the sediment amount entering water resources and the disposal of human sewage during the construction phase of the development. Recommended mitigation measures should take the form of maintaining buffer zones (50m from the watercourses) to trap sediments with associated toxins. During construction phase, provision of adequate sanitation facilities should be located outside its associated buffer zone.
- **Visual impacts** on quality of landscape occur due to the presence of the distribution powerlines in the operational phase and unsightly views caused by construction camp. The vegetation occurring in the area to be disturbed by construction camps must be salvaged and kept in a controlled environment such as a nursery, for future re-planting in the disturbed areas as a measure of rehabilitation.
- **Heritage site impacts** are caused by disturbance or destruction of graves/graveyards and archaeological sites during the construction phase. Mitigation measures should take the form of isolating known sites that include graves and declare them as no-go zones with sufficient associated buffer zones (preferably 50m). The SAHRA would have to be notified to this regard.
- **Social impacts** are as a result of influx of workers in the area and disturbance on land use and hence affecting adjacent landowners. As a mitigation measure; during the construction phase, the workers must be requested to respect the peacefulness and quietness (tranquility) of the area so as not to disturb the rural nature of the area. A positive impact would be the creation of unskilled employment opportunities for local communities during the construction phase.

Overall, the specialist impact assessments undertaken have not found any significantly detrimental issues that can be caused by the proposed power line between Groblersdal and Silimela substations. The impacts could be successfully mitigated through the implementation of the management measures in this EMPR.

1.5. Applicable Documentation

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

- Basic Assessment (BA) Report for the proposed Construction of the power line
- Environmental Authorisation issued by the Department of Environmental Affairs, (once issued).

2. PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

This Environmental Management Programme (EMPr) will deal with the environmental impacts associated with all aspects of this project and the mitigation measures required to prevent or minimize these impacts. The EMPr can be regarded as a guideline document to be strictly adhered to during all phases of the project including the construction and operational phase.

An Environmental Control Officer (ECO) will be appointed to monitor and audit the various phases of the project. An acknowledgement form would be signed by the various parties and / or Eskom Holdings SOC Limited, Limpopo Operating Unit (LOU) and the Contractors, and would form part of the contractual agreement between the Eskom Holdings (SOC) Limited, Limpopo Operating Unit (LOU) and the contractors to ensure that all the conditions and requirements of the EMPr are complied with.

A comparative assessment was carried out of published EMP Reports, whilst site-specific conditions and new information that has come to light were also incorporated. The aim of this EMPr is to integrate environmental planning, design, construction, and operational activities for the proposed development.

Compliance with the EMPr would be monitored by an ECO, who will keep a record of the audits and any important information that can be produced on request.

The objectives of the EMPr are to:

- Provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site.

- Ensure that the construction and operational phases of the project continues within the principles of Integrated Environmental Management.
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project.
- Ensure that the safety recommendations are complied with.

This EMPR, which forms an integral part of the contract documents, informs the land owner as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction and operational activities associated with the project. This is to include any rehabilitation and landscape processes work which is needed post-construction and which would be carried out by the contractor who may be appointed to do such rehabilitation work. The provisions of the EMPR are binding on the Contractor during the contract period and Eskom in the operational phase.

Any environmental issues that are identified during or after construction would be addressed in consultation with the environmental consultant. As such it should be viewed as a dynamic document that may require updating or revision where necessary.

All activities and earthworks associated with construction and reticulation of services would be undertaken in accordance with SABS 1200 standards, which deal with guidelines for civil engineering and general construction works.

3. PARTIES INVOLVED

Project Manager (PM - Eskom)

The Project Manager is appointed by Eskom Holdings SOC Limited, Limpopo Operating Unit (LOU) to oversee the work of all consultants, contractors, residents and visitors.

Contractor (C)

This refers to the main contractor(s) appointed by Eskom for the construction of the Project, or portion of the Project. The main contractor(s) are required to adhere to the EMPr and are responsible to ensure that all sub-contractors, suppliers and staff appointed by them also adhere to the EMPr.

Environmental Liaison Officer

The Environmental Liaison Officer (ELO) would be appointed by the contractor to monitor activities on site on a daily basis. The ELO would be the ECO's representative on the site and would report back on all audit trips. The ELO must report any major incidents immediately to the ECO.

All Staff

All workers employed by the contractor or Eskom, persons involved with activities related to the project, or persons present or visiting the construction area, including permanent, contract, or casual labour and informal traders.

Environmental Control Officer (ECO)

An individual nominated by Eskom to act on behalf of a Contractor in matters concerning the day-to-day implementation of the EMPr, and for liaison with: Department of Environmental Affairs; Municipalities; Provincial departments; and other relevant stakeholders such as the public and owners or managers of properties affected by the power line construction project.

An ECO must be appointed in terms of the NEMA EIA Regulations No. R543 of 18 June 2010. The ECO would inspect this development on a regular basis during the construction and rehabilitation phases, and would advise DEA and anyone acting in accordance with the Environmental Authorisation (e.g. Eskom, contractors etc.). In addition, anyone acting in accordance with the Environmental Authorisation (e.g. Eskom, Contractors etc.) would have to comply with the EMPr and sign an acknowledgement form, which would form part of the contractual agreements.

DEA

The Compliance Officer appointed by the National Department of Environmental Affairs to this project.

Local Community

People residing or present in the region and near the construction activities, including the owners and / or managers of land affected by construction, workers on the land, and people in nearby towns and villages.

Public

Any individual or group concerned with or affected by the Project and its consequences, including: the local community; local, regional, and national authorities; investors; workforce; customers; consumers; environmental interest groups; and the general public.

4. RECORD KEEPING

Copies of any Authorisation or EMPRs required for specific construction activities shall be kept on site and made available for inspection by visiting officials from the Employer or relevant environmental departments.

The Project Manager would monitor the Contractor's adherence to the approved impact prevention procedures and shall issue the Contractor a notice of non-compliance whenever transgressions are observed. The Contractor must document the nature and magnitude of any non-compliance in a designated register, the action taken to correct the non-compliance, the actions taken to mitigate its effects and the results of those actions. Any non-compliance shall be documented and reported to the Project Manager in a monthly report.

The Contractor shall also record all complaints received regarding activities on the construction site pertaining to the environment, and the response noted with the date and the action taken. These records shall also be submitted to the Project Manager in the monthly report.

All monthly and quarterly reports produced by the ECO should be submitted to both the construction manager and Eskom Project Manager. These reports should be kept in a file on site at all times.

5. COMPLIANCE AND PENALTIES

The duration over which the Contractor's controls shall be in place cover the construction period of the project as well as the limited time after the contract completion in the General Conditions of Contract, and the project specifications, as the defects liability period.

The Applicant / Contractor are deemed not to have complied with the EMPR if:

- Within the boundaries of the site, site extensions and access roads there is evidence of contravention of clauses;
- Environmental damage occurs due to negligence;

- The contractor fails to comply with corrective or other instructions issued by the Project Manager or Engineer or Environmental Control Officer within a specified time frame; and
- The contractor fails to respond adequately to complaints from the public or local community.

The Contractor shall act immediately after a notice of non-compliance is received, and correct the cause for the issuing of the notice. Application of a penalty clause would apply for incidents of non-compliance. The imposition of such a penalty shall not preclude the relevant provincial authority from applying an additional penalty in accordance with statutory powers.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as deemed fit. The polluter-pays principle applies.

The “polluter-pays” principle provides that “the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment. NEMA imposes a duty of care on every person who causes, has caused or may cause significant pollution or degradation of the environment is authorised by law or cannot reasonably be avoided, NEMA requires that the pollution must be minimised and rectified.

Furthermore, NEMA makes provision for damages to be awarded by the courts where loss or damage has occurred as a result of a contravention of certain environmental statutes. For example, offences under the National Water Act No. 36 of 1965 and the Environmental Conservation Act No. 73 of 1989 may result in penalties being imposed in terms of NEMA. Importantly, NEMA provides for the liability on conviction of employers, managers, agents and directors for any offences resulting from the failure to take all the reasonable steps that were necessary under the circumstances to prevent the commission of an offence.

6. AMENDMENTS TO THE EMPR

Any major issues not covered in the EMPR as submitted, would be addressed as addend to this EMPR, and submitted for approval prior to completion.

The EMPR is a living document and is subject to change from time to time in consultation with DEA. Any amendments to the EMPR will require approval from DEA. A confirmation letter from DEA approving the amendments to the EMPR would be attached as addenda.

7. ENFORCING THE EMPR

The Applicant / Contractor have a responsibility to ensure that all those people involved in the project are aware of and familiar with the environmental requirements for the project (this includes sub-contractors, casual labour, etc.). The EMPR shall be part of the terms of reference for all contractors, sub-contractors and suppliers. All contractors, sub-contractors and suppliers have to give some assurance that they understand the EMPR and that they will undertake to comply with the conditions therein. All senior and supervisory staff members shall familiarise themselves with the full contents of the EMPR. They shall know and understand the specifications of the EMPR and shall be able to assist other staff members in matters relating to the EMPR. On completion of construction, the EMPR shall be part of the terms of reference for the applicant and shall be made available to all ongoing contractors entering the property.

8. SIGNING OF THE EMPR

The acknowledgement form provided in Annexure B is to be signed by the Applicant (Eskom) and all the Contractors. All the Contractor's employees, especially the machine and equipment operators, are to be made aware of the conditions as contained in the EMPR and the contractual conditions relating to the environment, as contained in the contract document.

9. CONCLUSION

It is the view of the Environmental Assessment Practitioner that the preferred alternative route for the proposed power line would not have any significant negative geophysical, biophysical or socio-economic environmental impacts provided the recommendations regarding the mitigation and rehabilitation measures presented in this EMPR are adhered to.

Please note: No construction work shall commence until the final EMPR is authorised by the Department of Environmental Affairs.

10. PROCEDURE

10.1 PRE-CONSTRUCTION PHASE

The requirements of the EMPR should be discussed in adequate with Planning and Design team at an early stage in order to brief them to understand the environmental content of the document. The requirements of the EMPR must be incorporated into any tender/contract documents by way of specific clauses that convey the impact and mitigation required. These clauses are to be agreed between the responsible professional members of the team and the environmental consultant.

10.2 THE CONSTRUCTION PHASE: RESPONSIBILITIES AND GENERAL MATTERS

Miscellaneous environmental matters and the relationships between the Contractors, ECO and the other members of the professional team are outlined in the following sections.

10.2.1 The Contractor

The Contractors must comply at all times with the requirements of the EMPR and must acknowledge in writing by signing the acknowledgement form that they will abide by the contents of the EMPR.

10.2.2 The Applicant

Eskom (owning registered servitude of the power line) must be in overall charge of the contract, the contractor/s and the adjudication of the EMPR requirements. Eskom can delegate the daily controls on site to a project manager or similar responsible person, when necessary.

10.2.3 The Environmental Control Officer (ECO)

Eskom must appoint an independent ECO for the purpose of ensuring that the environmental

conditions as outlined in this EMPR are implemented by the Contractor.

Other environmental site-related issues would be monitored and reported on by the ECO as and when they may arise. The ECO is to have access to the site at all times, for the purpose of inspections to ensure that the environmental conditions of the EMPR are being implemented and adhered to.

10.2.4 Reporting Structure

Both the ECO and Contractor are obliged to report any incidents and non-compliance to the Eskom Project Manager at agreed intervals. The Environmental Liaison Officer (ELO) is responsible for advising and reporting to the Contractor during the construction process. Open communication between the ELO and ECO (Figure 2) should be encouraged so as to ensure that incidents identified are reported and rectified timeously.

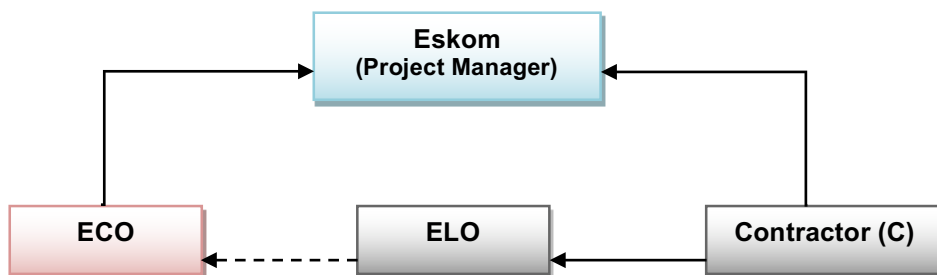


Figure 4: Communication channel between ECO, ELO, C and Eskom PM.

10.3 ENVIRONMENTAL MANAGEMENT DURING PROJECT PHASES

The following tables (Pre-Construction Phase; Construction Phase; and Operational Phase) form the core of this EMPR for the pre-construction, construction and operational phases of the development. These tables should be used as checklists on site, especially during the construction phase. Compliance with this EMPR must be audited weekly or monthly depending on the construction phase. After completion of construction, this must be followed up with annual audits for a period of two years during the operational phase.

Table 1: Table of abbreviations used below:

Abbreviation	Meaning
C	Contractor
ELO	Environmental Liaison Officer
E	Engineer
PM	Project Manager
ECO	Environmental Control Officer

In the context of the planning and construction of the 132kV powerline the following main activities apply:

- Eskom conducts soil nominations to determine the underlying soil types and strata, which in turn, informs the pylon type and foundations required for the pylons – this is done as part of the feasibility stage during the planning phase. Soil nominations entails digging into 4m of substrate/soil that is not rock or until rock is struck. This is done with a hand auger or hole borer/auger mounted on a truck. The auger mounted on a truck makes a hole 300mm in diameter. If a TLB (tipper, loader, back hoe) is used then they can only reach 2.5m down. Once the hole has been dug and the underlying substrate has been ascertained, the hole is backfilled. Eskom however indicated that soil nominations does not have to be taken where the pylons will be positioned, as they only need to determine the underlying conditions on a broad scale, and as such they could take samples in areas which is accessible.
- The proposed powerline route will be determined within the proposed corridor by the surveyor, in consultation with the EAP and botanical specialist to ensure that it causes the least amount of impacts by avoiding sensitive areas within the corridor.
- Once the route has been determined, the surveyor places pegs at sections along the proposed power line route and demarcate the proposed powerline pylon sites. In order to peg the location of the powerline, vegetation clearing will be required for access and line of sight.
- Once the route and pylon positions have been pegged, a geotechnical study will be undertaken at each exact pylon position to determine founding conditions and to inform the design of the pylon base. This requires the use of a TLB or backhoe to excavate soil

up to 20m deep. Access needs to be cut for the excavation equipment which will lead to vegetation loss. Topsoil may also be lost if not managed properly.

- The ECO/EAP then undertakes a site visit/line walk to ensure and verify that no wetlands or watercourses are located within 30m of the proposed pylon positions. Furthermore, the botanical specialist will be required to mark protected trees which may be cut or removed.

10.4 The following are recommendations from specialist studies

10.4.1 Botanical Study

Summary

- The study area investigated had a vegetation cover in a “poor state to fair state” with impacts related to grazing, cultivation, wood collection, settlement development, poor infra-structure maintenance and erosion.
- From an ecological perspective the proposed corridor for the power line is viable. Minimum clearing for this servitude is needed.
- Before any clearing or trimming commences, this specialist must accompany Eskom and the contractors to verify trees to be trimmed or cut.
- *Sclerocarya birrea* is present and the numbers must be counted and mapped once the final route is pegged (walk down study).
- Three red book data plant species is recorded for the area (Addendum 2) but the habitats they prefer is not present along the corridor.
- With regard to biodiversity patterns, little if any impacts will occur.
 - The vegetation type occurs over a very large area and the narrow corridor for the power line will have no large-scale negative impact on it.
 - No red data plant species were noted, as their preferred habitat is not present.
 - Some alien plant infestations were observed on the site or in the near vicinity. Clearing of soil can always lead to some infestations.
 - The activity will have no real impact on biodiversity processes. The only possible impact can be oil or fuel spillages that can occur during construction or the installation and maintenance of the transformers. It is always suggested that fuel and oil must not be stored on site during the construction phase and that containment dams or berms are constructed around transformers. In addition, a

clear plan how to manage accidental spills must be included in the EMP for the site.

Recommendations

- From an ecological perspective the proposed route for the new Silimela/Groblersdal power line is viable. The corridor uses the existing servitude and cut through an area with large current impacts, resulting in lowering the need for the clearing of natural vegetation. Permits for cutting, trimming and removal of *Sclerocarya birrea* must be acquired before clearing of the servitude can commence. A walk down study must be carried out to count and map the trees.
- Soils are highly **erodible** and care must be taken during construction to lower the risk of accelerated erosion.
- With careful planning of the construction activity impacts to the sensitive areas (slopes and exposed areas) can be reduced.
- Ensure no oil or fuel spills occur during construction or installation of transformers.
- Prevent and rehabilitate erosion.
- Make sure no wood collection takes place by contractors.

10.4.2 Avi-Fauna Specialist

The construction of the proposed power line will result in various threats to the birds occurring in the vicinity of the new infrastructure. The proposed power line poses a **low** electrocution, due to the proposed structure type, and can be reduced to **very low** with appropriate mitigation. Similarly, collisions have also been assessed as being of **very low** significance, and no additional mitigation is recommended. The habitat transformation and disturbance associated with the construction and decommissioning of the power line should have a **low** impact, which could be reduced to **very low** with appropriate mitigation.

Taking the above information into account, it can be concluded that, given the presence of existing habitat degradation and disturbance (associated with the agricultural activities, human settlement, and existing road and power line networks) that the power line can be constructed along the proposed route with acceptable levels of impact on the resident avifauna.

Recommendations

The project can proceed subject to the recommendations made below.

- An avifaunal walk through of the final power line route should be conducted prior to construction, to identify any species that may be breeding on the site or within the immediate surrounds and to ensure that any impacts likely to affect breeding species (if any) are adequately managed.
- The correct pole structure must be utilized to avoid electrocution
- In addition to this, the normal suite of environmental best practices should be applied, such as ensuring strict control of staff, vehicles and machinery on site and limiting the creation of new roads as far as possible.

10.4.3 Heritage Specialist

The Phase I HIA study for the proposed Eskom Similela Project did not reveal the presence of any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in the Project Area.

There is consequently no reason from a heritage point of view why Eskom's proposed Silimela Project should not continue

Recommendations

If any heritage resources of significance is exposed during Eskom's proposed Simelela Project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notify in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

11. PRE-CONSTRUCTION PHASE

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
Legislation, permits and agreements	Site Owner, Developer, Service Providers, Contractors and Project Managers must remain in compliance with relevant local, provincial and national legislation. The supreme law of the land is “The Constitution of the Republic of South Africa” which states: “Every person shall have the right to an environment which is not detrimental to his or her health or well-being”. Laws applicable to protection of the environment in terms of Environmental Management include but are not restricted to those listed in the draft BAR.	All	Prior to moving onto site, during construction and during operation
	A copy of the EMPr must be kept on site during the construction period.	C & PM	At all times
Access to site	Routing		
	a. The Contractor would have to ascertain the existing condition of the access roads and repair accordingly should damage occur due to construction.	ECO, C & PM	Prior to moving onto site and during construction
	b. Access route must be clearly defined with white stakes / painted rocks and disturbance outside these areas is not permitted.		
	c. Choice of access routes must take into account minimum disturbance to the environment particularly protected tree available on site		
	Haulage Roads		
a. All roads for construction access must be planned and approved by the Engineer and ECO ahead of construction activities. They must not be created on an ad-hoc basis. Use of existing roads must be the main preference and created access roads must be avoided as far as possible.	E / PM / C / ECO	Prior to moving onto site and during construction	

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>b. Roads must follow natural contours to reduce storm water runoff.</p>		
	<p>c. Roads must have as little cut and fill as possible.</p>		
	<p>d. Road widths and radii of curves are to be reduced to minimum requirements.</p>		
	<p>e. No trees / shrubs / groundcover may be removed or vegetation stripped without prior permission of the Engineer / Project Manager or ECO.</p>		
	<p>f. Turning points must be marked out on the site for easy identification by contract workers. No turning manoeuvres other than at designated places shall be permitted.</p>		
	<p>g. Contractors shall construct formal drainage on all temporary haulage roads in the form of side drains and mitre drains to prevent erosion and point source discharge runoff.</p>		
	<p>h. Haulage roads must allow for the natural flow of water where required. Road surfaces must be permeable to allow infiltration of rainwater. A gravel surface is recommended on all slopes < 10%, grassblock on slopes > 10%. This must ameliorate edge effects and channelling of water and subsequent scouring along roadsides.</p>		
	<p>i. Any natural veld along the proposed powerline route must be stripped to a soil depth of 150mm, and immediately translocated to a conservation area identified for rehabilitation. Material stripped from roads must be translocated five days post tillage.</p>		
	<p>j. Haulage roads must follow existing or proposed roads wherever possible. Routes must be clearly defined with white stake/painted rocks. Disturbance outside these areas is not permitted.</p>		
<p>Survey Points</p>			

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>a. Marking of survey points must be done with the Engineer and Project Manager's approval.</p>	E / PM	During surveys and preliminary investigations
	<p>b. Vegetation clearing and disturbance must be kept to a minimum during the survey operations, taking into account the high sensitivity areas of the site. No protected trees can be cut dead or alive without prior approval from DAFF.</p>	PM / ECO	
<p>Site Establishment (set up living quarters, site office, assembly area and workshops)</p>	<p>Layout & Location</p>		
	<p>a. Choice of site for the Contractor's camp requires the Project Manager's permission and must take into account the location of local residents and ecologically sensitive areas, including flood zones and slip / unstable zones. A site plan must be submitted to the Engineer for approval. The construction camp must preferably be positioned on previously disturbed area.</p>	E / C / PM / ECO	During surveys and preliminary investigations and prior to moving onto site
	<p>b. If the Contractor chooses to locate the camp site on private land, he must get prior permission from both the Project Manager and the landowner.</p>		
	<p>c. The size of the construction camp must be minimized (especially where natural vegetation or grassland has had to be cleared for its construction).</p>		
	<p>d. The construction camp must be properly fenced and secured. It must be kept in a clean and orderly state at all times. This would deter rodents and other fauna from entering the camp.</p>	E / C / PM	During site establishment and ongoing weekly inspections
	<p>e. The construction camp must be located on a level area at least 50m from any watercourse / riparian zones. The position of the camp must be ratified by the Engineer and Environmental Control Officer.</p>	E / C / PM / ECO	During site establishment
<p>f. The Contractor's camp may not be situated in a flood plain or on slopes greater than 1:3.</p>			

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	g. The construction camp must be fenced with a 1.8m high bonnox (or similar type) fence.		
	h. The Contractor must attend to the drainage of the campsite to avoid sheet erosion and / or standing water.	E / C / PM / ECO	During site establishment
	Ablutions		
	a. Where water borne sewage is not available, temporary chemical toilets must be provided by a company approved by the Project Manager. These toilets must be made available to all staff, and must be no closer than 50m from any watercourses. Such facilities, which shall comply with local authority regulations, shall be maintained in a clean and hygienic condition. Their use shall be strictly enforced. They shall be positioned in an appropriate place.	PM / C / ECO	During set-up
	b. The construction of a “long-drop” is forbidden.	PM / C	Ongoing
	c. There shall be a minimum of 1 toilet for every 20 workers and these must be situated no further than 100m from the work front.		
	d. Under no circumstances may open areas or the surrounding bush or degraded and built up area be used as a toilet facility.		
	Provision for Camp Waste Disposal		
	a. Bins and / or skips shall be provided at convenient intervals for the disposal of waste within the camp. The bins must be covered to prevent wind-blown rubbish and scavenging by people and animals.	PM / C / ECO	During site set-up and ongoing
	b. Bins should have liner bags for efficient and safe disposal of waste.		Ongoing
	c. At least three rubbish bins must be located at the construction camp for the collection of waste.		During site set-up and ongoing
	d. Recycling and the provision of separate waste receptacles for different types of waste should be		Ongoing

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>encouraged. Where possible, plastics, paper, glass and cans should be separated from other domestic waste for recycling. If waste is to be recycled, appropriately labelled waste receptacles must be made available.</p> <p>e. Any potentially hazardous containers must be punctured or disabled prior to disposal.</p>		
<p>Establishing Equipment Lay-Down & Storage Areas</p> <p>Storage areas can be hazardous, unsightly and can cause environmental pollution if not designed and managed carefully. Hazardous substances are those that are potentially poisonous, flammable, carcinogenic, or toxic. Some examples are: diesel, petrol, oil, bitumen, cement, solvent based paints, lubricants, explosives, drilling fluids, pesticides, herbicides, LPG.</p>	<p>General Substances and Materials</p>		
	<p>a. Choice of location for equipment lay-down and storage areas must take into account prevailing winds, distances to water bodies, general on-site topography and water erosion potential of the soil. These areas must be located within previously disturbed areas as far as possible for this project. Impervious surfaces must be provided where necessary.</p>	<p>PM / E / C / ECO</p>	<p>During site set-up</p>
	<p>b. Fire prevention and fire fighting facilities must be present at all storage facilities.</p>		
	<p>c. Storage areas must be secure so as to minimise the risk of crime. They must be safe from access by animals.</p>		
	<p>d. Equipment lay-down and storage areas must be designated, demarcated and fenced.</p>		
	<p>Hazardous Substances and Materials</p>		
<p>a. It is very important that the proximity of other developments is taken into account when deciding on storage areas for hazardous substances or materials. The areas must be suitably signed, fenced and access controlled.</p>	<p>PM / E / C / ELO / ECO</p>	<p>During site set-up</p>	
<p>b. Proper storage facilities for the storage of oils, paints, grease, fuels, bitumen, chemicals and any hazardous materials to be used must be provided to prevent the migration of any spillages into the ground and groundwater regime around the temporary storage areas.</p>		<p>During site set-up and ongoing</p>	

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>c. Fuel tanks must meet relevant specifications and be bunded to 110% of their capacity and elevated so that leaks are easily detected.</p>		
	<p>d. Residents living adjacent to the construction site must be notified of the existence of the hazardous storage area.</p>		
	<p>e. These storage facilities must be on an impermeable surface that is protected from the ingress of stormwater from surrounding areas to ensure that accidental spillage does not pollute local soil or water resources. The Contractor shall submit a method statement to the Engineer / Project Manager and ECO for approval.</p>		
	<p>f. Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs must additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes.</p>		Ongoing
	<p>g. Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures. The Contractor must ensure that its staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing / equipment in case of spillages or accidents and have received the necessary training.</p>		
	<p>h. Absorbent materials must be available at the construction site to clean any chemical, fuel or lubricant spills during construction. empty packaging associated with the storage of hazardous chemicals, paints, solvents, lubricants (such as tins, 210 litre drums) is to be returned</p>		

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	to the supplier where possible or alternatively be recycled (e.g. to a drum recycling company). If neither of these options is feasible then the packaging should be disposed of in a suitable landfill.		
<p>Education of site staff on general and environmental conduct</p> <p>These points need to be made clear to all staff on site before the project begins</p>	<p>Education</p> <p>a. Ensure that all site personnel have a basic level of environmental awareness training. The Contractor must submit a proposal for this training to the ECO for approval. Topics to be covered must include:</p> <ul style="list-style-type: none"> • What is meant by “environment”; • Why the environment needs to be protected and conserved; • How construction activities can impact the environment; • What can be done to mitigate against such impacts; • Awareness of emergency and spills response provisions; • Social responsibility during construction e.g. being considerate to local residents. <p>It is the contractor’s responsibility with the help of the Environmental Liaison Officer to provide the site foreman with no less than 1 hour’s environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.</p>	PM / C / ELO / ECO	During staff induction and ongoing
	<p>b. Staff that would be operating equipment shall be adequately trained and sensitised to any potential hazards associated with their tasks.</p>	PM / ELO / C / ECO	During staff induction, followed by ongoing monitoring
	<p>c. Translators are to be used where necessary.</p>		
	<p>d. The Engineer / Project Manager / Environmental Control Officer must be on hand to explain more difficult /</p>		

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>technical issues and to answer questions which may be raised.</p> <p>e. Construction workers must be made aware that they are not to make excessive noise e.g. shouting and hooting.</p> <p>f. The use of pictures and real-life examples is encouraged as these tend to be more easily remembered.</p> <p>g. Use should be made of environmental awareness posters on site.</p> <p>h. No operator shall be permitted to operate critical items of mechanical equipment without having been trained by the Contractor and certified competent by the Project Management.</p> <p>i. All Employees must undergo the necessary safety training and wear the necessary protective clothing at all times.</p> <p>j. The need for a “clean site” policy also needs to be explained to the construction workers.</p>		
	<p>Worker conduct on site</p> <p>a. A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following rules:</p> <p>b. No alcohol / drugs to be present on site; no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs.</p> <p>c. Prevent excessive noise to minimise disturbances to adjacent landowners.</p> <p>d. No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel).</p> <p>e. No unsocial behaviour shall be permitted.</p> <p>f. Bringing pets onto site is forbidden.</p> <p>g. Construction staff are to make use of facilities provided</p>	<p>PM / C / ELO</p>	<p>During staff induction, followed by ongoing monitoring</p>

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden)</p> <p>h. No fires to be permitted on site. Encourage the use of gas operated cookers for preparation of food on site</p> <p>i. Trespassing on private / commercial properties adjoining the site is forbidden</p> <p>j. Only <i>pre-approved</i> security staff and workers shall be permitted to live on the construction site.</p> <p>k. No worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do.</p> <p>l. The staff conduct rules are described in a separate table of Rules (Annexure A of the EMPr). This is aimed at providing staff with the basic information regarding worker conduct on site.</p>		<p>Prior to moving onto the site and ongoing</p>
<p>Social Impacts</p> <p>It is important to take notice of the needs and wishes of those living or working adjacent to the site. Failure to do so can cause disruption to work and increase cost in the form of delays</p>	<p>Public Participation</p> <p>a. All Interested and Affected Parties (I&APs) must be contacted in order to inform them of the starting date of construction and the proposed duration. I&APs must be notified of the construction process and the manner to which it will be implemented via public notices.</p> <p>b. Open liaison channels must be established between the site owner, the developer, operator, the contractors and I&APs such that any queries, complaints or suggestions can be dealt with quickly and by the appropriate person(s). These people would usually have been identified by the environmental consultant that was assigned to the project (during the Basic Assessment Phase). If this was not the case, the I&APs can be identified as those that live close by the site, work close to the site, would have their services / infrastructure affected by the project, have a</p>	<p>PM / C / ELO</p> <p>PM / C / ELO</p>	<p>Prior to moving onto the site and ongoing</p>

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	general interest in the project, and / or the Ward Councillor in which the construction is taking place.		
	c. Should the construction staff be approached by members of the public or other stakeholders, they must assist them in locating the Project Manager / Contractor, or provide them with a number on which they may contact the Project Manager / Contractor.	C / PM / ELO	Ongoing
	d. The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous at all times. Failure to adhere to this requirement may result in the removal of staff from the site by the Engineer. Contract workers must be trained on how they can help combat the spread of HIV&AIDS within the local community and their families.		Ongoing monitoring
	e. Adequate designated parking must be provided for site staff and visitors.	C / PM	Prior to moving onto site
	f. A complaints register must be kept on site. I&APs need to be made aware of the existence of the complaints book and the method of communication available to them. Details of complaints must be incorporated into the audits as part of the monitoring process. These complaints must be monitored to identify trends and they must be addressed timeously.	C / PM / ECO	Ongoing
Visual Impacts			
	a. Storage facilities, elevated tanks and other temporary structures on site must be located such that they have as little visual impact on local residents, tourists and motorists as possible.	PM / C / ECO	Ongoing – more frequently during dry and windy conditions
	b. Lighting on the construction site must be pointed downwards and away from oncoming traffic and adjacent landowners.	PM / C / ECO	During set up and ongoing

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	c. Special attention must be given to the screening of highly reflective materials on site.	PM / E / C / ECO	During site set up.
	Wood Collection and Illegal Hunting		
	<ul style="list-style-type: none"> • Must ensure no wood collection takes place (by construction workers for cooking). • Game animals are present, care must be taken that no illegal hunting takes place – mostly by snares. <p>The construction teams must be informed – strategy must form part of EMP.</p>	C / PM / ECO	Ongoing
Dust / Air / Light Pollution Establishment of the camp site, and related temporary works can reduce air quality	a. Vehicles travelling along access roads must adhere to speed limits to avoid creating excessive dust.	PM / C	Throughout the duration of the project
	b. Camp construction / haulage road construction – areas that have been stripped of vegetation must be dampened periodically to avoid excessive dust.	ECO / C / E	During site set up
	c. The Contractor must make alternative arrangements (other than fires) for cooking and / or heating requirements. LPG gas cookers may be used provided that all safety regulations are followed.	PM / C	Throughout the duration of the project
Soil Erosion The stripping of vegetation during preliminary activities on site greatly increases the risk of soil erosion.	Conservation of Valuable Soil Resources		
	a. Wind screening and stormwater control must be undertaken to prevent soil loss from the site. It is recommended that gabion mattresses are placed at culvert inlets and outlets as erosion control measures. b. Procedures that are in place to conserve topsoil during the construction phase of the project are to be applied to the set up phase, i.e. topsoil is to be conserved while	E / PM / C / ECO	Throughout the duration of the project

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>providing access to the site and setting up the camp.</p> <p>c. Topsoil stripped from the construction camp and other construction areas must be stockpiled away from any potential disturbances.</p> <p>d. Stockpiled topsoil must be either vegetated with indigenous grasses or covered with suitable fabric to prevent erosion and invasion by weeds.</p> <p>No driving through any streams except on existing roads.</p> <p>Limit traffic along the power line servitude.</p>		
	<ul style="list-style-type: none"> • No surface stormwater generated as a result of the development may be directed directly into any natural drainage system or wetland. • A surface runoff and stormwater management plan, indicating the management of all surface runoff generated as a result of the development (during both the construction and operational phases) prior to entering any natural drainage system or wetland, must be submitted (e.g. stormwater and flood retention ponds). • In order to minimise artificially generated surface stormwater runoff, total sealing of paved areas such as parking lots, access roads, pavements and walkways should not be permitted. Permeable material should rather be utilized for these purposes. In addition, runoff rain water from all roofs must be managed to prevent erosion. • No activity such as temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment or any other use of the buffer/flood zone whatsoever, may be permitted during the construction phase. 		

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<ul style="list-style-type: none"> An on-site ecological management plan must be implemented for drainage lines including management recommendations as well as potential rehabilitation of disturbed areas. 		
<p>Stormwater</p> <p>Serious financial and environmental impacts can be caused by unmanaged stormwater.</p>	<p>Stormwater Damage Prevention</p>		
	<p>a. To prevent stormwater damage, the increase in stormwater runoff resulting from the construction activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings.</p>	E / ECO / PM	During surveys and preliminary investigations.
	<p>b. During site establishment, stormwater culverts and drains are to be located and covered with metal grids to prevent blockages if deemed necessary by the Engineer.</p>	E / PM	During site establishment
	<p>c. Temporary cut off drains and berms may be required to capture storm water and promote infiltration.</p>	ECO / E / PM	During site set up.
	<p>d. The stormwater drainage system must not be contaminated by other sources; therefore must be separated from other waste water drainage systems. The stormwater management plan must ensure that flow from the development does not result in negative impacts on downstream properties or watercourses.</p>	E/ ECO / PM	During surveys and preliminary investigations.
<p>Water Quality</p> <p>Incorrect disposal of substances and materials and polluted run-off can have serious negative effects on groundwater quality.</p>	<p>Maintenance of Water Quality</p>		
	<p>a. Storage areas that contain hazardous substances must be bunded with an approved impermeable liner which can contain 110% of the storage tank capacity.</p>	E / PM / ECO	During site set up.
	<p>b. Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimise pollution risk and reduced bunding capacity.</p>	E / ECO / C / PM	
	<p>c. A designated, bunded area is to be set aside for vehicle</p>		

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	washing and maintenance. Materials caught in this bunded area must be disposed of to a suitable waste disposal site or as directed by the Engineer.		
	d. Provision must be made during set up for all polluted runoff to be treated to the Engineer's approval before being discharged into the stormwater system. Any waste which cannot be treated to acceptable standards on site must be treated and disposed by a licensed treatment company.		During site set up, to be monitored weekly
<p>Conservation of the Natural Environment</p> <p>Alien plant encroachment is particularly damaging to natural habitats and is often associated with disturbance to the soil during construction activities. Care must be taken to conserve existing plant and animal life on and surrounding the site considering the sites high ecological sensitivity</p>	<p>Flora, Fauna and Avifauna</p>		
	a. No vegetation may be cleared without prior permission from the Environmental Control Officer / Project Manager	PM / ECO	During site set up, and ongoing.
	b. Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas.	ECO / C / ELO	Ongoing in camp site, haulage areas.
	c. Monitoring of the site is required to identify any alien species that may establish within the servitude and adjacent areas. These alien species should be eradicated according to CARA.		Ongoing monitoring
	<ul style="list-style-type: none"> • Need to ensure all alien plants on construction sites are removed. • Must clear alien vegetation on a regular basis. <ul style="list-style-type: none"> • Disturbed areas around the construction sites should be re-vegetated. 	ECO / C / ELO	Ongoing in camp site, haulage areas.
	d. The sections of line that would pose a concern for avifauna and require marking are to be finalised by Avi-Fauna Specialist in an "avifaunal walkthrough" once final route is decided and towers/pylons pegged.	E/ ECO / PM	During surveys and preliminary investigations.
<p>Set up of Waste Management</p>	<p>Waste Management</p>		
	a. The contractor is responsible for the internal collection of refuse and for transporting it to a registered landfill site	C / ELO	During site set up

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	once every week; unless a service agreement is entered into between the contractor and the local municipality.		
	b. The excavation and use of rubbish pits is forbidden.	PM / ECO / C	During site set up
	c. Burning of waste is forbidden ¹ .		
	d. A fenced area must be allocated for waste sorting and storage prior to removal.		
	e. Individual skips for different types of waste (e.g. 'household' type refuse, building rubble, etc.) must be provided.	C / PM / ECO	During site set up and on going
Cultural Environment	Protection of Cultural Environment / Heritage sites		
	a. Prior to the commencement of construction, all staff needs to know what possible archaeological or historical objects of value may look like, and to notify the Engineer / Contractor should such an item be uncovered. If any artefacts or graves are uncovered during construction, all work on site is to cease and SAHRA as well as the ECO is to be notified for comment. Construction may only commence once approval by SAHRA is granted.	ECO / PM / C / ELO	During site set up and ongoing.
b. Any graves which may be affected indirectly during the construction phase (i.e. graves situated closer than 30m) must be demarcated with brick walls or with fences prior to commencement of construction.			During site set up
Safety and Security	Fencing / Demarcation		
	a. Potentially hazardous areas such as trenches / storage areas are to be demarcated and clearly marked.	PM / C / ECO	Ongoing.
	Lighting		
a. Lighting on the construction campsite is to be set out to	PM / C / ECO	Ongoing.	

¹ A possible exception to this may be that the alien invasive vegetation which is removed from the site which should be burned to prevent the spread of the plants.

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	provide maximum security and to enable policing of the site, without creating a visual nuisance to local residents.		
Risks Associated with Materials on Site			
	a. Material stockpiles or stacks, such as cables and other distribution line equipment must be stable and well secured to avoid possible injury to site workers / local residents.	PM / C / ECO	Ongoing.
	b. Flammable materials must be stored as far as possible from adjacent residents / businesses.		
	c. Fire fighting equipment must be present on site at all times as per OHSA.		
	d. Obstruction to drivers' line of sight due to stockpiles and stacked materials must be avoided, especially at intersections and sharp corners.		
	e. No materials are to be stored in unstable or high-risk areas such as in floodplains or on steep slopes.		
	f. All I&APs must be notified in advance of any known potential risks associated with the construction site and the activities on it. Examples of these are stringing of power lines, blasting, earthworks / earthmoving machinery on steep slopes above houses / infrastructure, risk to residences along haulage roads / access routes.		

12. CONSTRUCTION PHASE

This pertains to all environmental impacts associated with construction and is not limited to the land on which the Project is to be located. It includes the site footprint, construction campsites, access roads and tracks, as well as any other area affected or disturbed by construction activities. The EMPr (particularly the specifications for rehabilitation) is relevant for all areas disturbed during construction. Furthermore, the EMPr must take into account all secondary impacts on the local community and the public. (It is recommended that any disturbances, which may take place, commence only after the first spring flush so that any indigenous vegetation can be relocated for rehabilitation.)

- **Site Clearing**

According to the Ecological study conducted by Dr Wynand Vlok, he indicated that from an ecological perspective the proposed route for the new Silimela/Groblersdal power line is viable. The corridor uses the existing servitude and cut through an area with large current impacts, resulting in lowering the need for the clearing of natural vegetation. Permits for cutting, trimming and removal of *Sclerocarya birrea* must be acquired before clearing of the servitude can commence.

- Limited plants need to be removed when clearing the servitude for the new power line. Clear guidelines and proper plans must be given to the contractor. Daily inspections are needed to prevent problems.
- Must clear alien vegetation on a regular basis.
- Exposed areas should be rehabilitated with a grass mix that blends in with the surrounding vegetation. The grass mix should consist of indigenous grasses adapted to the local environmental conditions. The grass seeds should a variety of grass species including several pioneer species.
- A walk down study must be carried out to count and map the protected trees.

- **Site establishment**

Site establishment shall take place in an orderly manner and all required amenities shall be installed at Camp sites before the main workforce move onto site. The Construction camp shall have the necessary ablution facilities with chemical toilets at commencement of construction activities. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no

circumstances shall indiscriminate sanitary activities be allowed other than in supplied facilities. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at a registered landfill. A certificate of disposal shall be obtained by the Contractor and kept on file. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. The disposal of waste shall be in accordance with all relevant legislation. Under no circumstances may solid waste be burnt on site.

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
Access to the site	Maintenance of the access		
	a. The access to the site would need to be upgraded to an acceptable standard during construction (i.e. such that large amounts of dust are not generated and there is no unwarranted damage caused to construction vehicles).	PM / E	Initial set up and ongoing
	b. Contractors shall ensure that access roads are maintained in good condition by attending to potholes, corrugations and stormwater damages as soon as these develop.	E / C / ELO / ECO	Establish at setup
	c. There needs to be adequate drainage of water underneath the access roads (both during construction & in operation). This can be done through a culvert / water diversion system.	PM / E / ECO	When necessary
	d. During construction, any dirt access roads could potentially be surfaced with a compacted gravel layer (shale) in order to allow for the increase in vehicular traffic on these roads. A chemical stabilizer could be added to assist with the surface binding and reduce the dust produced by vehicular traffic on the road.	PM / C	When necessary
	e. Unnecessary compaction of soil by heavy vehicles must be avoided; construction vehicles must be restricted to demarcated access, haulage routes and turning areas.	PM / C / ELO / ECO	Ongoing, and specifically after heavy rains
	f. Machine / vehicle operators must receive clear instructions to remain within demarcated access routes. Movement of heavy-duty	ECO / C / ELO / PM	Ongoing, and specifically after

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	vehicles and vehicles not connected with work in progress must be restricted to the construction zone in order to control related impacts such as damage in the construction zone, compaction of soil, damage to vegetation and noise pollution		heavy rains
	g. Person and vehicle access must be restricted during construction so as to control access to otherwise potential dangerous excavations and materials.	ECO / PM / C / ELO	Ongoing, and specifically after heavy rains
Maintenance of Construction Camp	Haulage Roads		
	a. Contractors shall ensure that all side and mitre drains as well as V Drains and scour check walls on access and haul roads are functioning properly and are well maintained.	C / PM / E / ECO	Ongoing, and specifically after heavy rains
	Surfaces		
	a. The Contractor must monitor and manage drainage of the camp site.	PM / C / ECO	Weekly inspection
	b. Run-off from the camp site must not discharge into adjacent landowners' properties.		
	Ablutions / Sewage		
	a. Chemical toilets are to be maintained in a clean state on a regular basis and must be moved to ensure that they adequately service the work areas.	PM / ECO / ELO	Ongoing
	b. The Contractor is to ensure that open areas or the surrounding bush are not being used as a toilet facility.	ELO / C / ECO	Weekly
	Camp Waste Disposal		
	a. The Contractor shall ensure that all litter is collected from the work and camp areas daily. The construction area must be cleared of litter, debris (e.g. Cement packets, bitumen residues etc.) and other domestic waste on completion of the day's work.	PM / C / ELO / ECO	Ongoing
	b. Bins and / or skips must be emptied regularly and waste must be disposed of at a registered landfill site. Waybills for all such disposal are to be kept by the Contractor for review by the PM /	PM / C / ECO	Daily

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	ECO.		
	c. A registered chemical waste company is to be used to remove waste from chemical toilets on site.	PM / C / ELO / ECO	Weekly / As needed
	Eating Areas		
	a. Eating areas must be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness.	ELO / C	Weekly monitoring
	b. All litter throughout the site must be picked up on a daily basis and placed in the bins provided.	ELO / ECO / C	Daily / Ongoing monitoring
	Housekeeping		
Staff Conduct	a. The Contractor shall ensure that his camp and working areas are kept clean and tidy at all times.	C / ELO	Ongoing
	Environmental Education and Awareness		
	a. The Contractor must monitor the performance of the construction workers to ensure that the points relayed during their induction have been properly understood and are being followed. If necessary, the ECO and / or a translator should be called to the site to further explain aspects of environmental or social behaviour that are unclear.	C / ECO	Ongoing
	Worker Conduct on Site		
	a. A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following rules:	PM / C / ELO / ECO	Ongoing
	b. No alcohol / drugs to be present on site; no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs.		
c. Prevent excessive noise to minimise disturbances to local residents.			
d. No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel).			
e. No unsocial behaviour will be permitted.			
f. Bringing pets onto site is forbidden.			

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>g. Construction staff are to make use of facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden)</p> <p>h. No fires to be permitted on site. Encourage the use of gas operated cookers for preparation of food on site</p> <p>i. Trespassing on private / commercial properties adjoining the site is forbidden</p> <p>j. Only <i>pre-approved</i> security staff and workers shall be permitted to live on the construction site.</p> <p>k. No worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do.</p> <p>l. The staff conduct rules are described in a separate table of Rules (Annexure A of the EMPr). This is aimed at providing staff with the basic information regarding worker conduct on site</p>		
<p>Dust / Air Pollution</p> <p>Main causes of air pollution are dust particles from vehicle movements and stockpiles, vehicle emissions and fires</p>	<p>Dust & Air Pollution</p> <p>a. Vehicles travelling to and from the construction site must adhere to the speed limits so as to avoid producing excessive dust. A speed limit of 20 km/h must be adhered to on the construction site.</p> <p>b. Limiting construction operational hours from 07h00 and 17h00 would reduce congestion and disturbance in surrounding areas and minimize road deterioration and consequent dust creation.</p> <p>c. Access points and other cleared surfaces must be dampened whenever necessary and especially in dry and windy conditions to avoid excessive dust.</p> <p>d. Vehicles and machinery are to be kept in good working order and to meet the manufacturer's specifications for safety, fuel consumption etc. Should excessive emissions be observed, the Contractor is to have the equipment seen to as soon as possible.</p> <p>e. Stockpiles may cause dust and so must be managed in accordance with the guidelines in Materials Management.</p>	<p>ECO / C / PM</p> <p>ECO / C / PM</p> <p>PM / C / ELO</p>	<p>As directed by Engineer / Project Manager</p> <p>As directed by Engineer / Project Manager</p> <p>Ongoing</p>

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	f. If dust is unavoidable, screening would be required utilising wooden supports and shade cloth.	PM / C / ECO	Ongoing
	h. Dust must be suppressed on access roads and construction sites during dry periods by the regular application of water or a biodegradable soil stabilising agent	PM / C / ELO	Ongoing
Soil Erosion	Topsoil Stripping and Stockpiling		
	a. Excavated soil must be deposited in a landfill site. Soil disturbance would be minimized by establishing the extent of the construction site (pre-construction phase) and clearly demarcating this on the site layout plans. No construction personnel or vehicles may leave the demarcated areas except when authorised to do so by the Project Manager.	PM / C	Ongoing
	b. Erosion prevention measures must be implemented: Berms, sand bags and hessian sheets may be used to contain all sediment whilst energy dissipaters must be constructed at all outflow points.	PM / C	Ongoing
	Exposed Surfaces		
	a. Side tipping of soil and excavated materials shall not be permitted – all spoil material shall be exposed of as directed by the Engineer.	PM / C / ECO	As each activity is completed.
	b. Stormwater control and wind screening must be undertaken to prevent soil loss from the site.	E / PM / C / ECO	Ongoing
	c. There must be no offsite impacts of stormwater. A general rule is that the stormwater velocity eddies on the site must be the same as the predevelopment area.	E / C / PM	As directed by the Engineer / Project Manager
	d. In areas where steep slopes are excavated, erosion control measures need to be initiated and these may include seeding, brush packing and stone packing.	E / ECO / PM / C	
e. Appropriate cambers and v-drains must be constructed on the access roads in order to dissipate surface water runoff and sheet erosion.	E / ECO / PM / C		

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>f. A Storm Water Management Plan must be developed, provided and implemented by the Engineer. Drainage must be controlled to ensure that runoff from the access road does not lead to erosion and offsite pollution of any water resources along the road. The stormwater drainage system must not be contaminated by other waste sources generated during construction phases of the development.</p>		
	<p>g. The temporary toilet facilities must not be allowed to enter the storm water drainage system. Waste from these facilities must be collected by the service provider and disposed of at a permitted waste disposal site. These facilities must be regularly serviced and would be managed according to the service plan developed by the Engineer / Project Manager</p>	E / ECO / PM	
	<p>h. All embankments, unless otherwise directed by the Engineer, shall be protected by a cut off drain to prevent water from cascading down the face of the embankment and causing erosion.</p>	PM / E / C / ECO	Ongoing and as directed by the Engineer / Project Manager
<p>Storm Water Construction activities frequently result in diversion of natural water flow resulting in concentration of flow and an increase in the erosive potential of the water</p>	<p>General Principles</p>		
	<p>a. The Contractor shall not in any way modify nor damage the banks or beds of streams, rivers, wetlands, other open water bodies and drainage lines adjacent to or within the designated area, unless required as part of the construction project specification. Where such disturbance is unavoidable, modification of water bodies must be kept to a minimum in terms of removal of riparian vegetation and opening of the stream channel.</p>	E / C / ECO	Directed by the Engineer / Project Manager
	<p>b. Earth, stone and rubble is to be properly disposed of so as not to obstruct natural pathways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers.</p>	E / C / ECO	Directed by the Engineer / Project Manager
	<p>c. Stormwater outfalls must be designed to reduce flow velocity and avoid stream bank and soil erosion.</p>	E/ PM / ECO	As surface becomes

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
			exposed
	d. The Contractor is to ensure that impediments to natural water flow is avoided during construction, or is temporarily diverted.	E / PM / ECO / C	Regular monitoring
	e. There must be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.	E / PM	Ongoing
	Un-channelled Flow		
	a. During construction un-channelled flow must be controlled to avoid soil erosion.		
	b. Where surface runoff is concentrated (e.g. along exposed tracks), flow must be slowed by contouring.	E / PM / ECO / C	
	c. Rock Bolsters are to be placed across the invert of drains susceptible to erosion for every 2m vertical drop.	PM / C / E / ECO	On-going monitoring
Water	Water Quality		
	a. Every effort must be made to ensure that any chemicals or hazardous substances do not contaminate the soil or ground water on site.	PM / C / E / ECO	On-going monitoring
	b. Care must be taken to ensure that runoff from vehicle or plant washing does not enter surface or ground water. Vehicles and machinery may only be cleaned at a designated place at the construction camp.	PM / C / E / ECO	On-going monitoring
	c. Mixing / decanting of all chemicals and hazardous substances must take place either on a tray or on an impermeable surface.	PM / E / ECO	On-going monitoring / as the work progresses
	d. Contaminated wastewater must be managed by the site manager to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp shall be collected and removed from the site for appropriate disposal at a licensed commercial facility.		
	Water Supply		
	a. During heavy rainfall, when there is existence of water in adjoining riparian zones, the use of water for water provision is strictly prohibited.	PM / E / C	

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	b. Ensure that the existing potable water source is maintained for domestic use during construction.	PM / C / ECO	
Conservation of the Natural Environment	Avifauna, Fauna and Flora		
	a. The Contractor is to check that vegetation clearing has the prior permission of the PM / ECO. Vegetation that is removed is to be replanted and excavation is to be kept to a minimum.	PM / ECO / ELO	Ongoing monitoring / as the work progresses
	b. Prevent construction of towers in ecologically sensitive areas, such as mountainous regions, wetlands / riparian zones, drainage lines, Inselbergs and koppies.	ECO / ELO / PM	
	c. Remove and trans-locate succulent and other rare vegetation occurring within the footprint of the towers prior to construction.	ECO / PM / C	
	d. Construct towers on disturbed areas as far as possible	ECO / PM	As directed by Project manager ongoing
	e. Important Bird Areas are likely to be traversed by the powerline. Marking the earth wires of the powerline with suitable anti-collision making device must be determined. The avifaunal specialist's recommendations for marking areas must also be adhered to (post-construction phase)	ECO / PM / E	Ongoing along route alignment
	Alien Vegetation Encroachment		
	Alien vegetation encroachment onto the site as a result of construction activities must be controlled during construction. Immediate re-vegetation of stripped areas and removal of aliens by weeding must take place.	ECO / PM / E	Ongoing monitoring / as the work progresses
<ul style="list-style-type: none"> • Need to ensure all alien plants on construction sites are removed. 			
<ul style="list-style-type: none"> • Must clear alien vegetation on a regular basis. <ul style="list-style-type: none"> • Disturbed areas around the construction sites should be re-vegetated. • Must have rehabilitation strategy as part of EMP 			
Geology			

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>a. In the event of excavation, the material that is removed must be separated into topsoil and subsoil. The top 150mm would be considered topsoil and must be stockpiled separately.</p>	ECO / PM / E	Ongoing monitoring / as the work progresses
	<p>b. In the event of infilling, replacement of subsoil must precede the topsoil replacement, and all material must be well compacted.</p>	PM / C / ECO	Ongoing monitoring
<p>Distribution Line on visual impact</p>	<p>a. Avoid crossing over or through ridges, rivers, wetlands or any natural features that have visual value. This also includes centers of floral endemism and areas where vegetation is not resilient and takes extended periods to recover.</p>	PM / C / ECO / E	Ongoing during construction progresses
	<p>b. The tower types used for the powerline should be the most permeable and create an extremely low degree of visual obstruction</p>		
	<p>c. Avoid changing the alignment's direction too often in order to minimise the use of the self-supporting strain tower. This tower type is the most visually intrusive as the steel lattice structure is more dense than other tower types, hence creating more visual obstruction</p>		
<p>Materials Management</p>	<p>Stockpile Management</p>		
	<p>a. Stockpiles must not be situated such that they obstruct natural water pathways.</p>	PM / C / ECO	Ongoing monitoring
	<p>b. Stockpiles must not exceed 2m in height unless otherwise permitted by the Engineer / Project Manager or be left for longer than 3 months.</p>		
	<p>c. If stockpiles are exposed to windy conditions or heavy rains, they must be covered either by vegetation or cloth, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases.</p>		
	<p>d. Stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding.</p>	PM / C / ECO / E	Ongoing monitoring

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
<p>Waste Management</p> <p>Definition; “Refuse” refers to all construction waste (such as rubble, cement, bags, timber, cans etc.)</p>	<p>Handling of Hazardous Materials</p>		
	<p>a. Cement, bitumen and other potential environmental pollutants must be mixed on an impermeable surface with special provisions for storm water management.</p>	<p>E / PM / C / ECO</p>	<p>On-going monitoring</p>
	<p>b. All Empty containers must be removed from the site for appropriate disposal at a licensed commercial facility.</p>		
	<p>c. No vehicles transporting concrete or bitumen to the site may be washed on site.</p>		
	<p>d. Lime and other powders must not be mixed during excessively windy conditions.</p>		
	<p>e. All substances required for vehicle maintenance and repair must be stored in sealed containers until they can be disposed of / removed from the site.</p>		
	<p>f. Hazardous substances / materials are to be transported in sealed containers or bags.</p>		
	<p>g. Spraying of herbicides / pesticides must not take place under windy conditions and must comply with OHSAs specs and other chemical handling laws.</p>		
	<p>h. The Contractor is to outline a method statement for the dealing of accidents / spillages of hazardous materials.</p>		
	<p>On-site Waste Management</p>		
	<p>a. The Contractor shall ensure that all refuse is collected from the camp and work areas daily.</p>		
	<p>b. All material used for construction and maintenance must be removed from the site after construction or maintenance work.</p>		
	<p>c. Refuse must be placed in the designated skips / bins which must be regularly Emptied. These must remain within demarcated areas and must be covered to prevent wind-blown rubbish.</p>		<p>Monitored weekly</p>
	<p>d. In addition to the waste facilities within the construction camp, provision must be made for waste receptacles to be placed at</p>		<p>Ongoing</p>

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	intervals along the work front.		
	e. Littering on site is forbidden and the site shall be cleared of litter at the end of each working day.		
	f. Recycling is to be encouraged by providing clearly marked separate receptacles for different types of waste and making sure that staff are aware of their uses.		
	Waste Disposal		
	Non – hazardous waste		
	a. All waste must be removed from the site and transported to a registered landfill site.	ELO / PM / ECO	At least 24hours prior to the activity taking place.
	b. Waybills proving disposal at each site shall be provided by the Project Manager.		
	c. Any construction rubble shall be disposed of at registered disposal sites.		
	d. Waste from chemical toilets must be disposed of regularly and in a responsible manner by a registered waste contractor. Care must be taken to avoid contamination of soils and water, pollution and nuisance to adjoining areas.	PM / C / ECO	Ongoing
	Hazardous Waste		
	a. Contaminated water associated with construction activities must be contained in separate bermed areas and must not be allowed to enter into the natural drainage system.	PM / ECO / C	
	b. Chemical waste must be stored in appropriate containers and disposed of at licensed disposal facilities.	PM / C / ECO	On-going
	c. Soil that is contaminated with, e.g. cement, bitumen, petrochemicals or paint must be disposed of at a registered hazardous landfill site.	PM / C / ECO	Ongoing
	d. A sump must be created for concrete waste. This is to be de-sludged regularly and the cement waste is to be removed to a tip site as approved by the local authority.	PM / C	

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
<p>Social Impacts</p> <p>Regular communication between the Contractor and the I&APs is important for the duration of the contract.</p>	<p>Disruption of Infrastructure and Services</p>		
	<p>a. Contractors activities and movement of staff is to be restricted to designated construction areas.</p>	PM / ECO / C	Ongoing
	<p>b. Should the construction staff be approached by members of the public or other stakeholders, they must assist them in locating the Engineer / Project Manager or Contractor, or provide a number on which they may contact the Project Manager or Contractor.</p>	E / PM / ECO	At least 24 hours prior to the activity taking place.
	<p>c. The conduct of the construction staff when dealing with the public or stakeholders shall be in a manner that is polite and courteous at all times. Failure to adhere to this requirement may result in the removal of staff from the site by the Project Manager.</p>	PM / C	Ongoing
	<p>d. Disruption of access for local residents must be minimised and must have the consent of the Engineer / Project Manager.</p>	E / PM / C / ELO	Monthly
	<p>e. The Contractor is to inform adjacent landowners in writing of disruptive activities at least 24 hrs beforehand. This can take place by way of leaflets placed in the post boxes giving the Project Manager and Contractor's details or other method approved by the Project Manager.</p>	E / PM / C	
	<p>f. Drivers of construction vehicles must exercise care when travelling to and from the site specifically when travelling through villages – a maximum speed limit of 30 - 40km/h must be adhered to. Drivers of construction vehicles must be considerate of other road users. They are to be especially careful at narrow sections and water crossings or where livestock is being herded.</p>	E / PM / ECO	
	<p>Wood collection and Illegal Hunting</p>		
	<p>a. Must ensure no wood collection takes place (by construction workers for cooking). b. Game animals are present, care must be taken that no illegal hunting takes place – mostly by snares. c. The construction teams must be informed – strategy must form part of EMP.</p>	PM / C / ECO / ELO	Ongoing monitoring

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	Visual Impacts		
	a. Lighting on the construction site must be pointed downwards and away from oncoming traffic and nearby houses.		
	b. The site must be kept clean to minimise the visual impact of the site.		
	c. If screening is being used, this must be moved and re-erected as the work front progresses.	E / PM / ECO	Ongoing / As required
	Noise		
	a. Machinery and vehicles are to be kept in good working order for the duration of the project to minimise noise nuisance to neighbours.	PM / C / ECO	As required
	b. Notice of particularly noisy activities must be given to residents adjacent to the construction site. Examples of these include: noise generated by jackhammers; blasting; drilling.		
	c. Noisy activities must be restricted to the times given in the Project Specification or General Conditions of Contract (GCC).	PM / C / ECO	Ongoing
	Communication with I&APs		
	a. The Engineer and Contractor are responsible for ongoing communication with those people that are interested / affected by the project.		
	b. A complaints register must be housed at the site office. This must be in carbon copy format, with numbered pages. Any missing pages must be accounted for by the Contractor. This register is to be tabled during monthly site meetings.	PM / C	
	c. I&APs need to be made aware of the existence of the complaints book and the methods of communication available to them.	PM / C / ECO / ELO	Ongoing
	d. Queries and complaints are to be handled by: - documenting details of such communications; - submitting these for inclusion in the complaints register; - bringing issues to the Project Manager's attention immediately;		

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	and - taking remedial action as per Project Manager's instruction. e. Selected staff is to be made available for formal consultation with I&APs in order to: explain the construction process; and answer questions.		
Cultural Environment	Protection of Cultural Environment / Heritage sites		
	a. Should any archaeological sites or items of historical significance including old stone foundations, tools, clay ware, jewellery, remains, fossils, graves etc. be uncovered during construction, their existence must be reported to the ECO and SAHRA, an archaeological study may be required.	ECO / PM / C	Ongoing
	b. If any artefacts or graves are uncovered during construction, all work on site is to cease and SAHRA as well as the ECO is to be notified for comment. Construction may only commence once approval by SAHRA is granted.	ECO / PM / C	Ongoing
Safety and Security	Signage		
	a. Any potentially hazardous areas such as excavated trenches/pits or chemical storage areas are to be demarcated and clearly signed in English and Afrikaans. Sidewall protection (e.g. shoring) to be erected for deep trenches as per the requirements of the Occupational Health and Safety Act of South Africa (OHSA).	ECO / PM / C	Ongoing
	Risks Associated with Materials on Site		
	a. Fire fighting equipment must be present on site at all times.	C / PM	During site setup and as construction progresses.
	b. No materials are to be stored in unstable or high-risk areas such as in floodplains or on steep slopes		
	General Safety		
	a. The construction camp is to be securely fenced and locked		Ongoing with

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	when not in use. No unauthorised access is to be allowed to members of the public and people not associated with the construction process.		monitoring
	b. Construction personnel to be issued with suitable PPE (e.g. safety shoes, hard hats) free of charge and PPE for construction areas are to be defined prior to the activity commencing.	C / ECO / PM	Ongoing
	c. All procedures and equipment on site must be used in accordance with the Occupational Health and Safety Act regulations of South Africa (OHSA), Act No. 85 of 1993).	C / PM	Before any construction or earthmoving activities occur and ongoing during construction.

13. POST-CONSTRUCTION PHASE

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
Construction Camp	Construction Camp Rehabilitation		
	a. All structures comprising the construction camp are to be removed from site.	PM / C / ECO	Project completion.
	b. The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint and fuels, etc. and these must be cleaned up.		
	c. All hardened surfaces within the construction camp area must be ripped, all imported materials removed, and the area shall be top-soiled.		
	d. The Contractor must arrange the cancellation of all temporary services.		
Avifauna	Avifaunal impacts mitigation		
	Mark the line with anti-collision marking devices on the earth wire to increase the visibility of the line and reduce likelihood of collisions. Marking devices should be spaced 5m apart. Spans that cross drainage lines should be marked with bird flight diverters on the earth wire of the line, five metres apart, alternating black and white: Pylons must be placed outside of the drainage line perimeter; Poles should be fitted with bird perches on top of the poles to draw birds from insulators; and The removal of large trees should be avoided.	PM	Project completion
Vegetation	Landscaping		
	a. All disturbed areas or areas which have been engineered for the purpose of the development are to be rehabilitated with indigenous vegetation which must be sourced from surrounding areas where possible. This will aid in preventing erosion within the site.	E / PM / C / ECO	Project completion.

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>Tower footprint area</p> <p>a. Rehabilitate disturbed areas around tower footprint as soon as practically possible after construction. This should be done to restrict extended periods of exposed soil.</p>	PM / C / ECO	Project completion.
Land Rehabilitation	<p>Land Rehabilitation</p> <p>a. Excavated soil and soil disturbance – excavated soil not used in the development must be disposed of in a landfill site. Soil disturbance would be minimized by establishing the extent of the construction site (pre-construction) and clearly demarcated in on-site layout plans.</p> <p>b. Rehabilitation must be executed in such a manner that surface runoff would not cause erosion of disturbed areas during and after rehabilitation.</p> <p>c. All areas to be vegetated that comprise surfaces hardened due to construction activities are to be ripped and imported material thereon removed.</p> <p>d. All rubble is to be removed from the site to an appropriate disposal site as approved by the Project Manager. Burying of rubble on site is prohibited.</p> <p>e. The site is to be cleared of all litter.</p> <p>f. All embankments are to be trimmed, shaped and re-planted to the satisfaction of the Engineer.</p> <p>g. Surfaces are to be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the Project Manager.</p> <p>h. All trimmed and / or compacted areas must be left rough to facilitate binding of topsoil and vegetation.</p> <p>i. The Contractor is to check that all watercourses are free from building rubble, spoils materials and waste materials.</p>	<p>E / PM / C / ECO</p> <p>PM / C / ECO</p> <p>E / PM / C / ECO / ELO</p> <p>PM / C</p> <p>PM / C / ECO</p>	Project completion.
Materials and Infrastructure	<p>Removal of Barriers, Remediation of Damage</p> <p>a. All material used for construction and maintenance of</p>	PM / C / ECO	As completed

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	the distribution line must be removed from site after construction / maintenance.		
	b. All leftover construction materials must be removed from the site.	PM / C / ECO	On completion
	c. The Contractor must repair any damage that the construction works has caused to adjacent areas.	PM / C / ECO	Continually as necessary
	d. Fences, barriers and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the Project Manager.	PM / E / C	On completion
	e. All residual topsoil stockpiles must be removed to registered landfill sites or spread on site as directed by the Engineer / Project Manager.		
	f. All areas where temporary services were installed are to be rehabilitated to the satisfaction of the Project Manager and ECO.	PM / E / ECO / C	
General	General Remediation		
	a. Temporary road works must be closed and access across these blocked.	E / PM / C / ECO	On completion of the construction and maintenance phases
	b. A meeting is to be held on site between the Project Manager, Environmental Control Officer and the Contractor to approve all remediation activities and to ensure that the site has been restored to a condition approved by the Engineer / Project Manager and ECO.		

14. OPERATIONAL PHASE

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
Vegetation / Landscape Management	a. All rehabilitated areas would need to be maintained and re-seeded with local indigenous vegetation where necessary on a regular basis.	Eskom	Ongoing
Distribution Line - Minimise Avifauna impacts	<p>a. Install Bird Guards on towers on the lines, as per Eskom Distribution Guidelines. This should deter birds from perching in the high risk areas of towers.</p> <p>b. An avifaunal walk through is required to identify towers requiring Bird Guards (also during post-construction phase).</p> <p>c. Should any breeding sites be encountered, activity in the vicinity of the site must be halted and the Avi-Fauna specialist must be consulted for further advice.</p> <p>d. The nests must be left alone as far as possible</p> <p>Nests should be monitored closely and if they begin to pose problems then Avi-Fauna specialist should be consulted for recommendations on how best to manage them.</p> <p>Nest management recommendations may include nest removal in cases where no other species are breeding on the same nest, for example Pygmy Falcons and assorted other raptors.</p>		
Storm Water Management	a. All stormwater attenuation measures must be monitored on an annual basis through a general environmental audit.		
Solid Waste / Refuse Removal	a. Waste removal generated through maintenance must be undertaken by the Local Municipality waste removal services as and when required.		

ACTIVITY	MANAGEMENT / MITIGATION	RESPONSIBILITY	SCHEDULE / FREQUENCY
	<p>However, the following measures must form part of the general management of the site:</p> <p>Monitoring of solid waste removal</p> <p>Disposal of hazardous substances (i.e. paint) in an approved manner.</p>		
Sewerage	<p>a. Portable toilet facilities must be provided for maintenance workers and serviced and maintained as and when necessary by a registered waste disposal company.</p>		

15. DECOMMISSIONING PHASE

The objective of providing guidelines during the decommissioning phase is to prevent structures from being left to deteriorate and look unsightly. It is imperative that non-functional structures be removed as soon as possible, and that the site is rehabilitated as soon as possible. If non-functional structures are not needed anymore, and not removed, it must be maintained that they would be used to prevent the environmental degradation of the site.

Eskom Holdings SOC Limited, Limpopo Operating Unit (LOU) is responsible for ensuring the construction of the new power line from Groblersdal to Silimela substation is properly maintained at all times.

16. RECOMMENDATIONS FROM SPECIALISTS

- It is recommended that the poles that will be used be fitted with bird perches on top of poles to draw birds, particularly vultures, larks and eagles away from the potentially risky insulators.
- It is recommended that an Archaeologist conduct monitoring during the excavation to ascertain any possible occurrence of heritage resources that are found underground.
- It is recommended that should any material or artefacts of cultural significance found during exaction, all activities should cease and SAHRA and/ or an Archaeologist be informed immediately
- It is also recommended that mitigation measure for the proposed activity throughout the project life-cycle are included in the Environmental Management Programme (EMPr) attached to this document.
- A copy of the EMPr must always be available on site.

ANNEXURE A

STAFF CONDUCT CONTROL AND INFORMATION SHEET

1	<u>ALL STAFF MUST OBEY THE FOLLOWING RULES:</u> DO NOT leave the construction site untidy and strewn with rubbish that will attract animal pests.
2	DO NOT bring your pets to the construction site.
3	DO NOT trespass on private properties not linked to the project.
4	DO NOT carry a weapon on the construction site or in the vehicles transporting workers to and from the construction site.
5	DO NOT set fires unnecessarily.
6	DO NOT cause any unnecessary disturbing noise at the construction camp/site or at any designated worker collection/drop off points.
7	DO NOT drive a construction-related vehicle under the influence of alcohol.
8	DO NOT exceed the national speed limits on public roads or exceed the recommended speed limits in this management plan (where applicable) whilst driving a construction vehicle.
9	DO NOT drive a vehicle that is generating excessive noise (noisy vehicles must be reported and repaired as soon as possible).
10	DO NOT litter along the roadsides, including both public and private roads.
11	DO NOT remove or destroy vegetation at the construction camp/construction site without the prior consent of the Project Manager and Environmental Control Officer.
12	DO NOT tamper with, destroy or remove vegetation from any areas that have been fenced off or marked.

ANNEXURE B

ACKNOWLEDGEMENT FORM

Record of signatures providing acknowledgment of being aware of and committed to complying with the contents of this Environmental Management Programme (EMPr), which relates to the environmental mitigation measures for the project outlined above, and the environmental conditions contained in the civil and other construction contract documents.

PROJECT NAME:

DEA REF:

PROPOSED DEVELOPMENT OF APPROXIMATELY 14.5KM BERSFORT OF 132KV POWER LINE FROM AN EXISTING GROBLERSDAL SUBSTATION TO THE APPROVED SILIMELA SUBSTATION IN THE ELIAS MOTSOLEDI LOCAL MUNICIPALITY OF SEKHUKHUNE DISTRICT IN THE LIMPOPO PROVINCE.

DEVELOPER / PROPONENT:

Signed: Date:

PROJECT MANAGER:

Signed: Date:

CONTRACTOR:

Signed: Date:

ENVIRONMENTAL CONTROL OFFICER

Signed: Date:

ANNEXURE C

GROBLERSDAL TO SILIMELA POWER LINE LOCALITY MAP