

KUDU POWER STATION (PS)–ORANJEMOND 1ST & 2ND 400KV LINES Environmental Management Plan

I. OBJECTIVES OF THE ENVIRONMENTAL MANAGEMENT PLAN

The compilation of this Environmental Management Plan (EMP) forms part of the requirements of the EIA Regulations 2014 and compliance with the contents of this report is required during the construction and operational phases of the project. The EMP serves as an environmental management tool by providing a generic structured plan of mitigatory measures, which serves as a guide to assist in minimising the potential environmental impact of the activity that may arise during the construction and operational phases.

The EMP provides a set of guidelines for the environmental management of all works to be executed by the Engineer and Contractor, so as to have a minimum impact on the environment in accordance with all relevant legislation, policies and standards.

In this context it should be viewed as a dynamic or 'living' document, which may require updating, or revision during the life-cycle of the project to address new circumstances as the need arises. It is essentially a written plan of how the environment is to be managed in practical and achievable terms.

The effectiveness of the EMP is limited by the level of adherence to the conditions set forth in this report by the Developer and the Contractor. It is further assumed that compliance with the EMP will be monitored on a regular basis as set out in the EMP and contractual clauses.

The EMP forms part of the Contract Documentation and is thus a legally binding document. An individual responsible for environmental damage must pay costs both to environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring (the Polluter Pays Principle).

Further to the above, the following objectives apply:

- To state the standards and guidelines which Eskom will be required to adhere to in terms of environmental legislation;
- To set out the mitigation measures and environmental specifications which Eskom will be required to implement for the construction phase of the project in order to minimise the extent of environmental impacts, and where possible to improve the condition of the environment;

- To provide guidance regarding the method statements which Eskom will be required to compile and implement to achieve the environmental specification;
- To define corrective actions which Eskom must take in the event of non-compliance with the specifications of this EMP;
- To mitigate potential negative impact associated with the project and ensure optimising of positive impact;
- To prevent long-term or permanent environmental degradation;
- To ensure that the applicant, construction workers and the operational and maintenance staff are well acquainted with their responsibilities in terms of the environment;
- To ensure that communication channels to report on environment related issues are in place.

II. DETAILS OF THE PERSON WHO PREPARED THE EMP

This Environmental Management Plan was prepared by Landscape Dynamics cc, an environmental consultancy firm established in May 1997. Their core business involves the execution of Environmental Impact Assessments that include the compilation of Environmental Management Plans for all of these projects. The team members responsible for this project and the compilation of the EMP are Annelize Grobler (012 460 6043 / 082 566 4530 / agrobler@landscapedynamics.co.za) and Susanna Nel (021 855 0912 / 082 888 4060 / susanna@landscapedynamics.co.za). A Company Profile and Curriculum vitae's are available from info@landscapedynamics.co.za.

III. DETAILS OF THE PROPOSED ACTIVITY

The applicant is Eskom Holdings SOC Limited, Group Capital Division. The contact person is Ms Rudzani Ranwedzi at the Eskom offices at Megawatt Park, Johannesburg. Her contact details are:
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E-mail Address: RanwedRP@eskom.co.za

The project

Kudu Power Station is located about 40km north of Oranjemond Main Transmission Station (MTS), in Namibia. This power station will provide power to both the NamPower and Eskom networks. The Oranjemond MTS is approximately 20km east of Alexander Bay, directly south of the Orange River in the Northern Cape Province.

The Eskom Kudu-Oranjemond Project involves the following main components:

- The existing Oranjemond MTS Substation would be upgraded and expanded to accommodate the new power lines as follows:
 - Constructing a 400kV yard and equipment including busbar;

- Installing a 1x 315MVA 400/220kV transformer
- Create at least 4x 400kV line bays to allow for potential development.
- 2x 400kV power lines would be constructed from the Namibian side of the Orange River across the river to connect to the Oranjemond MTS Substation
- A new access road to the existing Oranjemond Substation site
- The R382 road deviation at the south-east corner of the substation extension
- A two-track service road between the two new powerlines within the servitude.

IV LEGAL REQUIREMENT

The applicable legislation in terms of the environment refers to procedures prescribed by the provisions of the Environmental Impact Assessment Regulations, 2014, of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA).

The relevant applicable activities for which environmental authorisation are being applied for are:

1.3 LEGAL REQUIREMENT

1.3.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

This application is done in terms of the **National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA)** and the Environmental Impact Assessment Regulations published in Government Notice No. R.982, December 2014. Environmental Authorisation is requested for the following listed activities:

Listing Notice 1	
<p>GN 983, Dec 2014, Number 12 The development of-</p> <ul style="list-style-type: none"> (i) canals exceeding 100 square metres in size; (ii) channels exceeding 100 square metres in size; (iii) bridges exceeding 100 square metres in size; (iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size; (vi) bulk storm water outlet structures exceeding 100 square metres in size; (vii) marinas exceeding 100 square metres in size; (viii) jetties exceeding 100 square metres in size; (ix) slipways exceeding 100 square metres in size; 	<p>Two approximately 2km new power lines will be constructed and the footprint of the pylons will be 100m². Some of the pylon towers will be constructed within 32m from the Orange River.</p>

<p>(x) buildings exceeding 100 square metres in size; (xi) boardwalks exceeding 100 square metres in size; or (xii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs-</p> <p>a) within a watercourse; b) in front of a development setback; or c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; -</p> <p>excluding-</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; or (ee) where such development occurs within existing roads or road reserves.</p>	
<p>GN 983, Dec 2014, Number 19</p> <p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-</p> <p>(i) a watercourse; (ii) the seashore; or (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater</p> <p>But excluding where such infilling, depositing, dredging, excavation, removal or moving-</p> <p>a) will occur behind a development setback; b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.</p>	<p>Foundations of 100m² (therefore more than 5m³) will be constructed for the towers and some will occur within 32m of a watercourse (the Orange River).</p>
<p>GN 983, Dec 2014, Number 24</p> <p>The development of-</p> <p>(i) a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;</p> <p>but excluding-</p> <p>(a) roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or (b) roads where the entire road falls within an urban area.</p>	<p>The existing R382 road will be deviated at the south-east corner of the substation extension .</p>

<p>GN 983, Dec 2014, Number 27 The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>The existing 2,5 hectare footprint of the substation site will be enlarged by an additional 4 hectares of land. The site contains indigenous vegetation.</p>
<p>GN 983, Dec 2017, Number 47 The expansion of facilities or infrastructure for the transmission and distribution of electricity where the extended capacity will exceed 275 kilovolts and the development footprint will increase.</p>	<p>The project components for the substation upgrade involve</p> <ul style="list-style-type: none"> • the construction of a 400kV yard and equipment including busbar and bus coupler bay; • installing a 1x 315MVA 400/220kV transformer • creating at least 4x 400kV line bays to allow for potential development <p>In order to achieve the above, it is required to increase the existing 2,5 hectare footprint of the substation with an additional 4 hectares is required. The final footprint will be 6,5ha.</p>

Listing Notice 2

<p>GN 984, Dec 2014, Number 9 The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.</p>	<p>Two approximately 2km 400kV powerlines will be constructed. The expansion of the existing Oranjemond MTS Substation also forms part of the project components. The study area falls outside urban areas and industrial complexes.</p>
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Listing Notice 3

<p>GN 985, Dec 2014, Number 4 The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>(a) In Free State, Limpopo, Mpumalanga and Northern Cape provinces:</p> <p>i. In an estuary; ii. Outside urban areas, in:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding disturbed areas; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves;</p>	<ul style="list-style-type: none"> • A new access road wider than 4m will be built to the existing Oranjemond Substation site. • The R382 could be deviated at the south east corner of the substation site. It is estimated to involve approximately 4 weeks during the construction phase, but it may not be required at all if the bypass could be accommodated from another turn-off from the main road. A temporary road will need to be graded next to the current road during the deviation upgrade. • The study area on the northern side of the Orange River is classified as an Ecological Support Area (ESA).
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<p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas; or</p> <p>(hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or</p> <p>iii. In urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or</p> <p>(cc) Seawards of the development setback line or within urban protected areas.</p>	<ul style="list-style-type: none"> • The section of the study area south of the Orange River is classified as a Critical Biodiversity Area (CBA) Type 2. • The study area is located approximately 10km upstream from the Orange River Mouth Wetlands Important Bird Area (IBA) (SA 030) This IBA was declared a Ramsar site in 1991, as was the Namibian side of the mouth in 1995. Together they form the Orange River Mouth Transboundary Ramsar Site.
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<p>GN 985, Dec 2014, Number 12</p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance plan.</p> <p>(d) In Northern Cape:</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA 'or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>ii. Within critical biodiversity areas identified in bioregional plans;</p> <p>iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or</p> <p>iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>	<p>The existing 2,5 hectare footprint of the substation site will be enlarged by an additional 4 hectares of land. The site contains indigenous vegetation.</p> <p>The study area on the northern side of the Orange River is classified as an Ecological Support Area (ESA).</p> <p>The section of the study area on south of the Orange River is classified as a Critical Biodiversity Area (CBA) Type 2.</p>
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<p>GN 985, Dec 2014, Number 14</p> <p>The development of-</p> <p>(i) canals exceeding 10 square metres in size ;</p> <p>(ii) channels exceeding 10 square metres in size;</p> <p>(iii) bridges exceeding 10 square metres in size;</p> <p>(iv) dams, where the dam, including infrastructure and water surface area exceeds 10 square metres in size;</p> <p>(v) weirs, where the weir, including infrastructure and water surface area exceeds 10 square metres in size;</p> <p>(vi) bulk storm water outlet structures exceeding 10 square metres in size;</p> <p>(vii) marinas exceeding 10 square metres in size;</p> <p>(viii) jetties exceeding 10 square metres in size;</p> <p>(ix) slipways exceeding 10 square metres in size;</p> <p>(x) buildings exceeding 10 square metres in size;</p> <p>(xi) boardwalks exceeding 10 square metres in size; or</p> <p>(xii) infrastructure or structures with a physical footprint of 10 square metres or more;</p>	<p>Two approximately 2km new power lines will be constructed and the footprint of the pylons will be 100m² (will therefore exceed 10m²).</p> <p>Some towers will be constructed within 32m from a watercourse (the Orange River).</p> <p>The study area is located approximately 10km upstream from the Orange River Mouth Wetlands Important Bird Area (IBA) (SA 030) This IBA was declared a Ramsar site in 1991, as was the Namibian side of the mouth in 1995. Together they form the Orange River Mouth Transboundary Ramsar Site.</p>
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where such development occurs

- (a) within a watercourse;
 - (b) in front of a development setback or
 - (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;
- excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.

(a) In Free State, Limpopo, Mpumalanga and Northern Cape:

- i. In an estuary;
- ii. Outside urban areas, in:

- (aa) A protected area identified in terms of NEMPAA, excluding conservancies;
 - (bb) National Protected Area Expansion Strategy Focus areas;
 - (cc) World Heritage Sites;
 - (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
 - (ee) Sites or areas identified in terms of an International Convention;
 - (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;
 - (gg) Core areas in biosphere reserves;
 - (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;
- (ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or
- iii. In urban areas:
- (aa) Areas zoned for use as public open space;
 - (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or
 - (cc) Areas seawards of the development setback line.

Application for environmental authorisation was lodged with the Department of Environmental Affairs (DEA), registration number 14/12/16/3/3/2/977.

V. DETAILS OF PERSONS RESPONSIBLE FOR IMPLEMENTATION OF EMP

The following undertaking must be filled out and signed by the applicant and forwarded to DEA prior to commencement of construction:

AGREEMENT & UNDERTAKING OF THE APPLICANT

I hereby confirm and state that I am aware of the contents of the Environmental Management Plan and the conditions of the Environmental Authorisation and shall comply with all legislation pertaining to the nature of the work to be done and all things accidental thereto.

Signed on behalf of _____

Date: _____

Place: _____

Signature: _____

Full Name: _____

Postal Address: _____

Physical Address: _____

Office Telephone Number: _____

AGREEMENT & UNDERTAKING OF THE ENVIRONMENTAL CONTROL OFFICER

The following details of the Environmental Control Officer must be filled out, signed and forwarded to the Department of Environmental Affairs prior to construction:

Company Name: _____

Contact Person(s): _____

Physical Address: _____

Street Address: _____

Office Telephone Number: _____

Cell phone Number: _____

Fax Number: _____

V. PROPOSED MECHANISM FOR COMPLIANCE

Key impacts generally associated with Eskom construction activities which are applicable to this project are:

Direct (Primary) Impacts

Planning Phase (Route selection and design of line and substation):

- Impact on natural habitat (terrestrial fauna & flora)
- Impact on avi-fauna
- Impact on the Orange River
- Cultural-heritage impact
- Visual impact
- Impact on landownership / land claims issue

Construction Phase:

- Impact on natural habit (terrestrial fauna & flora)
- Disturbance to avi-fauna habitat
- Increased risk for surface and groundwater pollution
- Increased risk for erosion
- Influx of labourers to the area with associated crime, access control, risk for habitat destruction
- Impacts associated with construction activities such as noise and dust

During Operational Phase:

- Impact as a result of Eskom inspections and maintenance, i.e. on habitat destruction (pollution, removal of plant species; placement of snares, etc.)
- Risk for collision with birds, specifically across the Orange River.

Cumulative Impacts

- Visual Impact
- Reduced ability to meet conservation obligations & targets
- Impact on broad-scale ecological processes

Specifications and conditions are hereby provided to limit and/or prevent impact on these components during all the phases of project development, namely

- Specifications applicable throughout all Phases of Project Development
- Design & Pre-construction Phase
- Construction Phase
- Post-construction & Operational Phase

ROLES AND RESPONSIBILITIES
SPECIFICATIONS APPLICABLE THROUGHOUT ALL PHASES OF PROJECT DEVELOPMENT

DEPARTMENT OF ENVIRONMENTAL AFFAIRS

The National Department of Environmental Affairs (DEA) is the designated authority responsible for authorising this EMP. DEA has overall responsibility for ensuring that the Applicant complies with the conditions of Environmental Authorisation and the EMP.

DEA shall also be responsible for approving any amendments to the EMP (if required). DEA may also perform random site inspections to check compliance with the EMP.

DEPARTMENT OF WATER AFFAIRS & SANITATION

The Department of Water Affairs & Sanitation has confirmed rights to inspect the project at any time to ensure compliance with relevant legislation.

ESKOM HOLDINGS SOC LTD (DEVELOPER)

The Applicant is the Developer and has overall responsibility for compliance with the EMP as it is a fundamental component of the authorisation requirements for the project.

This means that the Developer must:

- Ensure that the professional team and the Contractors are appropriately briefed and that their appointment includes environmental requirements as relevant;
- Ensure that he/she is kept fully informed of the performance of the project against the requirements of the EMP;
- Ensure that appropriate action is taken where consistent incidents of non-compliance are taking place;
- Ensure that any corrective action required by the authorities is implemented.

Project Co-ordinator (PC)

The primary responsibility of the Project Co-ordinator (PC) is to ensure that the Contractor complies with the environmental specifications in this document. In addition the PC shall:

- Assume overall responsibility for the effective implementation and administration of the EMP;
- Ensure that the EMP is included in the Contractors' contract (including all subcontractors);
- Ensure that the EMP and any other relevant documentation are provided to the applicable contractors;
- Inform Environmental Practitioner of the date of construction at least 2 months in advance.

Construction Supervisor and the Contractor (if utilised);

- Undertake regular inspections of the Contractor's site (in conjunction with the Clerk of Works, where relevant) as well as the power line servitude in order to check for compliance with the EMP in terms of the specifications outlined in this document.
- Keep a register of major incidents (spills, injuries, complaints, legal transgressions, etc.) and any other relevant issues related to the EMP;
- Report any problems (or complaints) concerning the environment arising out of the construction phase to the appointed Environmental Control Officer;
- To ensure Contractor staff are trained in accordance with the EMP;
- To implement recommendations of possible audits.
- The contractor environmental site representative to have the following training, from a recognised or accredited institution:
 - Oil Spill Management Training
 - Integrated Waste Management
 - Environmental Awareness /Induction
 - Tree Identification (vegetation management)
 - Environmental Law Training
 - Environmental Authorisation_Environmental Management Plan (EA_EMP) Training
- The environmental site representative to be permanently on site during construction.
- The environmental site representative should have an appointment letter stipulating roles and responsibilities.

Eskom construction team or external construction contractor and all subcontractors

The construction team / contractor / subcontractor shall:

- Ensure that the environmental specifications of this document are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts;
- Monitor environmental performance and conformance with the specifications contained in this document during site inspections;
- Discuss implementation of and compliance with this document with staff at routine site meetings;
- Report non-compliances to EMP and Environmental Authorisation to PC and Environmental Control Officer (ECO) immediately (on discovery), within 24 hours of the event discovered or occurred;
- Report progress towards implementation of and non-conformances with this document at site meetings with the PC;
- Ensure that suitable records are kept and appropriate documentation is available to the PC; and
- Ensure that construction employees are trained in accordance with the requirements of the EMP.

The Contractor will conduct all activities in a manner that minimises disturbances to and impacts on the environment.

The Contractor is deemed not to have complied with this EMP if:

- There is evidence of contravention of clauses within the boundaries of the property and adjacent areas during the Construction Phase;
- If environmental damage ensues due to negligence;
- The Contractor fails to comply with corrective or other instructions issued by the Local Authority, PC, ECO, or the Developer within a specified time;
- Failure to take any reasonable measure to protect the environment if there is a perceived or identified environmental risk associated with an activity that has not been defined in the EMP; and
- The Contractor fails to respond adequately to complaints from the public.

Application of a penalty clause will apply for incidents of non-compliance as per the Schedule of Fines as mentioned below. Such fines will be paid by the Contractor to the Developer and will be used in rehabilitation and / or landscaping.

Environmental Control Officer (ECO)

The key responsibility of the ECO is to ensure that all the conditions stipulated in the Environmental Authorisation are being adhered to and should monitor project compliance with the conditions of the Environmental Authorisation, environmental legislation and the recommendations of the EMP.

Furthermore, the duties of the ECO shall include, inter alia, the following:

- Ensuring the necessary environmental authorisations and permits, if any, has been obtained;
- Advising the Contractor on environmental issues within defined construction areas;
- Undertaking once-per-month site visits, or more if required to ensure compliance with this EMP;
- Completing environmental checklists during site visits and keeping a photographic record of progress on site from an environmental perspective;
- Reporting back on any environmental issues/incidents to the DEA as reported to by the Contractor; and ensure that DEA is informed of work progress on site;
- Preparing an environmental audit report at the conclusion of the construction phase.
- Attending site meetings where applicable and where necessary inspect the construction site on a regular basis to ensure that the mitigation and rehabilitation measures are applied.
- Make reasonable amendments to the EMP in co-operation with the contractor. Penalties for non-compliance must be enforced.
- Remain employed until all rehabilitation measures as required for implementation due to construction damage, are completed and the site is handed over to Eskom by the contractor.

- Any conservation authority/institution as listed in the List of Interested and Affected Parties for the project should be allowed reasonable access to the construction site on request and arrangement with the ECO and the contractor.

Environmental Training and Awareness

The purpose of the environmental training is to communicate potential environmental impacts relating to construction activities to contractors to ensure that precautionary measures are undertaken to avoid and/or mitigate the impacts. Environmental awareness training sessions should be undertaken prior to any work commencing by any contractor or sub-contractor on site as well as throughout the construction phase. The ECO shall give initial EMP training prior to any work starting on site. The training record must be kept on the project file for each training session.

Where possible the presentation will be conducted in the language of the employees. The environmental training could, as a minimum, include the following:

- The importance of conforming with all environmental policies, procedures, plans and systems;
- The significant environmental impacts, actual or potential, which could result from their work activities;
- The environmental benefits of improved personal performance;
- The roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures
- The mitigation measures to be implemented when carrying out their work activities;
- The importance of not littering;
- The need to use water sparingly;
- Details of, and encouragement to, minimising the production of waste and re-use, recover and recycle waste where possible;
- Details regarding palaeontological, archaeological and historical sites which may be unearthed during construction, and the procedures to be followed should these be encountered;
- The procedures which should be followed should a grave or any other archaeological and/or palaeontological finds be encountered or unearthed during the construction phase;
- Details regarding flora and fauna of special concern, including protected/endangered plant and animal species, and the procedures to be followed should these be encountered during construction.

EMP training and awareness before commencement of construction

- Eskom will provide an Environmental Management Plan and Awareness Training for all employees of the Contractor, sub-contractor, consultants, agents, visitors and suppliers. The initial training workshop will be held prior to any work commencing on site. The Contractors shall ensure that all construction personnel, including senior route staff, sub-contractors and suppliers etc., attend the environmental awareness-training prior to commencing any work i.e.

camp establishment, clearing and installations. Additional staff, sub-contractors and suppliers coming on to the route must attend an environmental awareness workshop prior to the commencing their duties. Subsequent training and awareness sessions will be arranged at a mutually agreed time and venue.

- The main contractor must provide the ECO with (a) a list of all sub-contractors and their scope of work for the contract and (b) a time schedule of works before the initial environmental training awareness session is scheduled. This will assist the ECO to schedule subsequent EMP awareness training sessions as and when required.
- No construction work may take place on site unless under the supervision of a person who has attended an Environmental Awareness session.
- The PC shall inform the environmental practitioner prior to starting construction, so that training can be given.

EMP awareness training throughout the construction phase

- EMP awareness training must be given to new contractors and sub-contractors that start to work on site throughout the construction phase at various stages.
- All contractor and sub-contractor teams involved in work on site must be briefed on their obligations towards environmental controls and methodologies in terms of this EMP prior to commencement of any construction and construction related activities on an on-going basis throughout the construction phase.
- In the case of new workers coming on site throughout the construction programme, the site contractor is responsible to ensure all new labour arriving on site is made aware of the contents of the EMP and is briefed on the Environmental Awareness Training session.
- A register must be kept of all training given to contractors and sub-contractors, indicating the date, time, venue, attendees, name of trainer, name of contractor, signatures and unique numbers / identity numbers of attendees.
- If the construction is phased and the activities are different, a training session must be conducted before the commencement of each phase. The environmental issues, construction impacts and mitigation measures for each phase must be discussed in detail at this training session.

Emergency Management

All emergency incidents should be investigated in terms of Eskom's EPC 32-95: Safety, Health & Environmental Incident Management Procedure, in addition to any ELC requirement. This procedure describes the high-level intention for the effective incident management of work-related incidents as well as environmental damage. The aim of this procedure is to ensure and facilitate the effective and efficient management of incidents from the moment that one occurs, until it can be audited that corrective and preventive measures were developed and taken. This procedure is supported by annexes which set out the detailed rules, requirements and action steps as well as useful examples and templates. These two have to be read and applied together to ensure that the aim of this procedure and its supporting annexes is met.

An **Emergency Incident** can be defined as an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed. It is also an accident involving the spilling of a harmful substance that finds or may find its way into a water resource.

An **Environmental Incident** can be defined as pollution, erosion, cutting of protected and/or indigenous trees, hazardous substance spillages, wildlife interactions, public complaints and loss of biodiversity caused by Eskom Distribution's activities, as well as non-compliance to legislation such as Environmental Authorisations, Record of Decisions, permits and licences.

Incident Management – Aims and objectives

The aims and objectives of incident management are as follows:

- Reduce risk and prevent any recurrence of incidents
- Ensure incidents are managed effectively
- Ensure incidents are classified and recorded accurately
- Ensure prompt and appropriate investigation
- Promote the proactive use and value of near-miss occurrence reporting
- Improve the quality of safety and the work environment by learning from incidents, including near miss occurrences;
- Share incident information with all site personnel and other subcontractors.
- Report to relevant authorities as appropriate
- Promote the analysis of trends and review practices accordingly

Incident Reporting

After becoming aware of an incident, the following should be done as per Eskom's ELC procedure:

- All incidents must be reported via flash report within 24 hours or end of shift, regardless of the severity of the incident. Once an employee identifies that an incident has occurred, he/she must immediately notify his/her supervisor of such an incident, regardless of its severity, so that an appropriate and timely response can be made, an initial evaluation conducted, and an incident classification made.
- The responsible supervisor shall then send a flash report to the ECO and Project Coordinator within 24 hours of the incident. Thereafter, it will be determined by the ECO if reporting to the authorities is required.
- Immediate clean-up action is required;
- Eskom then has 14 days to formally investigate the incident internally before sending a report to the applicable authorities.

Hazardous Waste - Incident Reporting

If a leakage or spillage of hazardous substances occurs as a result of Eskom's activities or other users, the local emergency services will be immediately notified of the incident. The location,

nature of the load and the status of the site of the accident itself (i.e. whether further leakage is still taking place, whether the vehicle or the load is on fire, etc.) must be provided.

Written records of the corrective and remedial measures decided upon, and the progress achieved therewith over time, must be kept. Such progress reporting will be important for monitoring and auditing purposes. The written reports may be used for training purposes in an effort to prevent similar future occurrences.

Emergency Preparedness

Eskom's environmental emergency procedures ensure that there will be an appropriate response to unexpected or accidental actions or incidents that will cause environmental impacts, throughout the life cycle of the project. Such incidents may include, inter alia:

- Accidental discharges to water and land;
- Accidental exposure of employees to hazardous substances;
- Accidental veld fires;
- Accidental spillage of hazardous substances;
- Specific environmental and ecosystem effects from accidental releases or incidents

The Emergency Preparedness Plan

- Construction employees shall be adequately trained in terms of incidents and emergency situations.
- An emergency preparedness plan will include details of the organisation (manpower) and responsibilities, accountability and liability of personnel.
- The emergency preparedness plan shall include a list of key personnel.
- Details of emergency services (e.g. the fire department, spill clean-up services, etc.) shall be listed.
- Internal and external communication plans, including prescribed reporting procedures shall be listed.
- Actions to be taken in the event of different types of emergencies shall be included.
- Training plans, testing exercises, and schedules for effectiveness shall be included.
- Eskom will comply with the emergency preparedness, and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), the National Environmental Management Act, 1998 (Act No 107 of 1998), the National Water Act, 1008 (Act No 36 of 1998) and the National Veld and Forest Fire Act, 1998 (Act No 101 of 1998) as amended, and/or any other relevant legislation.
- *Hazardous material*
 - Information on hazardous materials, including the potential impact associated with each, and measure to be taken in the event of accidental release shall be listed.

Spillages

- Streams, rivers, underground water and dams will be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, wash water, organic materials and bituminous products.
- In the event of a spillage during the construction phase, the responsibility for spill treatment will be with Eskom and Eskom will be liable to arrange for competent assistance to clear the affected area.
- Eskom will compile and maintain environmental emergency procedure, to ensure that there will be an appropriate rapid response to unexpected or accidental environmental related incidents throughout the life cycle of the project.
- Incidents must be reported in line with OU Oil Spill Management Instruction and the Eskom's Incident Management Procedure. The incident must be reported within 24 hours via a flash report.
- The Environmental Control Officer (ECO) will assess the situation and act as required in all cases; the immediate response will be to contain the spill. The exact treatment of soil/water pollution will be determined by the ECO.
- Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice must be sought for appropriate treatment and remedial procedures to be followed. The costs of containment and rehabilitation will be for Eskom's account, including the costs of specialist input.
- *Hazardous substance spillages*
Hazardous substance spillages can be defined as any hazardous liquids or substances spilt that have the potential to pollute aquatic or terrestrial ecosystems or present a health hazard to other living organisms.
 - The Eskom construction team shall have an oil spill kit on site and where working with hazardous substances, also drip trays on trucks.
 - Vegetated areas cleared of hazardous waste will be re-vegetated.

During an emergency situation, the following will apply

- No person shall be allowed to approach a spill, fire, etc. unless he/she is equipped with the personal protective clothing and equipment.
- The risk involved shall be assessed before anyone approaches the scene of the incident with the emergency response plan as per Oil Spill Management Instruction and Environmental Emergency Preparedness Procedure.
- Any known or discovered spillage of toxic substances into a stream or river should be followed by immediate monitoring of the receiving streams and rivers.

Fires

- The adjacent landowners will be informed and/or involved in case of any fire that poses a threat to landowners.
- It must be ensured that the basic firefighting equipment is supplied to all living quarters, site offices, kitchen areas, workshop areas and stores.

- Welding gas cutting or cutting of metal will only be allowed inside the working/demarcated areas and with appropriate firefighting equipment at hand.

Monitoring

Monitoring will be undertaken as and when required. Any incidents that might have a detrimental impact on the environment will be investigated and environmental monitoring will be conducted. Complaints received will be checked through verifiable monitoring.

Inspections

On-going visual inspections will be conducted by the ECO. The ECO will spend time on site on the lookout for any unsafe acts and activities that transgress the requirements as specified in the EMP to define what action shall be taken to rectify the problem and prevent its reoccurrence.

Written instructions

Written reporting will be given following an audit. The written instructions will indicate the source or sources of the problems identified on site and propose solutions to those problems. The implementation to solutions will be assessed in a follow-up audit and further written instructions issued if required. Maximum allowable response time is 4 working days unless specified otherwise by the ECO.

Liaison

Eskom will comply with the requirements for public consultation as required by the National Environmental Management Act, 1009 (Act No 107 of 1998).

Throughout the project, ongoing liaison will be maintained with authorities and communities when needed to ensure that the following is done;

- Timeous advanced warning of any project activities that may have some impact on the surrounding communities i.e. blasting;
- Ongoing feedback on the environmental performance of the project;
- A complaints' register needs to be opened and maintained by the ECO. The register will contain the contact details of the person who made complaints and information regarding the complaint itself, including the date of submission.

Checking and Corrective Action

Non-compliance with the specifications of the EMP constitutes a Breach of Contract for which Eskom must be immediately notified accordingly. Eskom will be deemed not to have complied with the EMP if;

- There is evidence of contravention of the EMP specifications within the boundaries of the construction site, site extensions and access roads;
- There is contravention of the EMP specifications which relate to activities outside the boundaries of the construction sites;

- Environmental damage ensues due to negligence;
- Construction activities take place outside the defined boundaries of the site;
- Eskom fails to comply with corrective or other instruction.

Non-compliance will be dealt with in terms of the contract documentations signed by the various parties.

The approved Eskom penalty fee structure is as follows:

Non – compliance	Penalty for non-compliance
PRE-CONSTRUCTION	
Failure to demarcate Construction area/working areas off before construction starts.	R10 000-R15 000
Failure to maintain demarcated area(s) throughout the construction phase	
Failure to demarcate stock piling area of building materials	R1 000
Fencing off the construction site with mesh fencing of 1.8m, where necessary or other suitable material as agreed on by ECO and contract specifications	R5 000
Sitting of access road/s to be approved by ECO & demarcated with stakes before any construction starts (if applicable)	R5 000
Temporary route used for construction must be determined on site with ECO (if applicable)	R1 000 - R5 000
Sensitive features that may be harmed/removed/harvested must be clearly marked or demarcated and all construction team must be made aware of this.	R2 500 - R5 000
Failure to give environmental awareness to Construction team and all sub-contractors of all environmental aspects that could lead to imposition of environmental penalties/fines and keep the proof on file.	R5 000 - R10 000
All appointed contractors must attend Environmental Training contractor to assure that all subcontractors be informed and signed DOU	
Method statements must be provided on request by the ECO. No work may commence until the Method Statement is accepted by the ECO/Project Coordinator and Clerk of Works and contractor representative.	R2 500 - R5 000
CONSTRUCTION	
Failure to keep a copy of the EMP & Environmental Authorisation/Record of Decision (ROD) with all the conditions of approval and the relevant Method Statements must be kept on at site at all times.	R500 - R5 000
Construction team behaviour	R200 - R2 500
Construction team may not overnight on site.	
All noise and sound generated during all phases of the projects must comply with the relevant SANS codes and standards.	
Eating of meals only allowed in demarcated area	
No pets permitted on site	R5 000 - R10 000
Construction crew must stay within the demarcated construction area. (Applicable in sensitive sites)	

Failure to park all construction vehicle on the demarcated area and provision of any oil leaks must be made for example Drip trays	R1 000 - R5 000
Driving, parking and storing of machinery vehicles are only allowed inside demarcated areas and existing roads.	R500 - R5 000
Machinery may only be used on the road and may not disturb the vegetation on the sides of the road except if cleared by ECO. Machinery used must be carefully considered to limit environmental damage	
Failure to conduct bush clearing according to Eskom procedure for vegetation clearance and maintenance within the Overhead Power line Servitude and on Eskom owned land (refer to EPC 32-247)	R5 000 - R10 000
Failure to undertake herbicide spraying under the supervision of registered Pest Control Officer.	R5 000 - R10 000
Excavations	
No topsoil may be removed or altered outside the demarcated area and/or which was not specified. Storage of topsoil outside demarcated area to obtain permission from the landowner.	R5 000 - R10 000
Toilets	
Failure to put ablution facilities on site for the construction worker during the construction phase. These facilities must be used by the construction workers and be removed when the project is completed.	R2 500 - R5 000
Failure serviced the toilets regularly, (according to the manufacturer's instructions) and kept clean.	R1 000
Fire Prevention	
Failure to keep fire equipment on site at all times	R500 - R4 000
Failure to keep firefighting equipment to be in good working order and serviced.	R500 - R2 500
Keeping of open fire on site, this pose a risk of fire.	R1 000 - R5 000
Dust pollution control	
Failure to suppress dust through regular water spraying the emitted during the construction phase (Site specific/weather Dependent)	R500 - R5 000
Water run-off	
No contamination of water bodies, rivers, dams or wetlands is permitted	R5 000 - R15 000
Failure to take special care where the power line will cross river, streams or wetlands.	R2 500 - R10 000
Waste Management	
Failure to provide dust bins/skip on site in order to handle all waste litter generated during construction phase of the project.	R500 - R5 000
General litter / building refuse must be cleaned up on a regular basis from the site	R300 - R5 000
Cement-contaminated water, paint, oil, cement slurries, etc. must be stored in watertight containers or as agreed with ECO	R500 - R5 000
Failure to report oil spillage to ECO via flash report within 24 hours of the spill occurring	R2 500 - R5 000
Any cement / concrete spillage to be cleaned up immediately.	R500 - R5 000
Ready-mix delivery trucks must not carry out the wash down of their trucks on or around the site unless arranged with ECO.	
Waste must be disposed of at an official waste deposit site on a regular basis. Keep the proof on file, waste manifest.	R5 000 - R10 000
The absence of or inadequate drip trays or binding facilities for onsite oil leakage	R200 - R5 000
Failure to clean up oil/fuel leaks from on-site machinery	
Failure to keep oil spill remediation chemicals on site.	

Soil erosion	
Failure to prevent degradation and soil erosion on the construction site.	R500 - R5 000
Failure to notify property owners of the construction before commencement and obtain the permission in writing and keep on file.	R2 500 - R5 000
Rehabilitation	
Failure to remove rocks and stones/stock pile in area recommended by ECO	R500 - R5 000
Failure to remove all old concrete and alien materials from site	R500 - R5 000
Failure to clear all waste and building material on site before commissioning of the project	R500 - R5 000
General	
Failure to comply with the Environmental Conditions of the approved Environmental Authorisation	R5 000 - R20 000

DESIGN AND PRE-CONSTRUCTION PHASE
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ENVIRONMENTAL SUPERVISION

Eskom Distribution, specifically the Environmental Control Officer (ECO), Clerk of Works (CoW) and Project Coordinator (PC) must inspect the construction site on a regular basis (during pre-construction, construction and post-construction periods) to confirm the current state of the site and to ensure that the mitigation and rehabilitation measures are applied as specified in the EMP. These officers might make reasonable amendments to the EMP in co-operation with the contractor.

Space to set up a temporary construction camp is required; this will include space for storage of material and equipment, site offices, waste separation areas, parking for construction vehicles, toilets, etc. This area must be identified by the contractor and ECO where the least impact will be. Site preparation and site rehabilitation must be according to the vegetation mitigation measures as given below.

ON-SITE COMMUNICATION PROCEDURE

On site start-up / kick-off meeting

- The mandatory on-site start-up meeting that is conducted preferably 14 days but not less than 5 working days prior to commencement of any site/camp establishment, earthworks and/or construction activities and will relate to additional discussed information that must be complied with during the entire construction phase.
- All site-specific issues and arrangements as discussed and agreed on at the site start-up meeting.
- Information pertaining to specific site construction agreements that was discussed at the kick-off meeting on site by all the relevant parties and agreed on and must be recorded and included as part of the EMP.
- Any changes made to the EMP as per the agreements between all parties on site must still fall within the conditions of the Environmental Authorisation.
- At the site start-up meeting, the following issues must be discussed:
 - The Construction EMP & other relevant site documents
 - Project to be discussed and all uncertainties are cleared
 - Method statement/s to be discussed
 - Access routes

- Road and construction area to be demarcated
- Materials stockpile and lay down areas to be demarcated
- Method of stockpiling to be discussed
- Firefighting procedures
- Mandatory firefighting equipment & fire preventative measures
- Mandatory site equipment and facilities
- Solid waste facilities and removal intentions
- Placement, type and service of toilets to be agreed on
- Placement and type of rubbish bins and removal of rubbish to be agreed on
- Environmental Education and awareness training session to all contractors & onsite staff/labour.
- Location & establishment of concrete batching plant facility.

Monthly construction progress meetings

- Environmental matters pertaining to the construction of the project must be included as an agenda item on the monthly project construction progress meeting.
- The ECO must be invited to monthly construction progress meetings to discuss findings of site audits, mitigation measures and other issues arising pertaining to the implementation of the EMP conditions.

Minutes of meetings

- Environmental issues, action items, complaints, incidents and mitigation measures must be recorded in minutes of monthly construction project meetings.
- The ECO must be included in the circulation of minutes of meetings in order to stay informed of construction progress and construction issues as they relate to the receiving environment.

DESIGN

- The engineering drawings must adhere to any site-specific mitigation measures (if applicable) supplied by a geotechnical engineer for the project in order to accommodate the geotechnical and earth-scientific constraints in terms of founding and construction methods, construction materials, excavation, etc.
- The engineers must ensure that all new light fixtures associated with the substation provide precisely directed illumination to reduce light spillage beyond the immediate surrounds of the substation site (if applicable).
- A surface runoff management plan indicating the management of all surface runoff generated as a result of the development (during construction and operation) must be compiled. This is specifically relevant to the substation site (if applicable). It should indicate how water velocities will be reduced before stormwater enters natural channels and how natural processes for water infiltration of the affected landscape will be accommodated. This study is

to be commissioned by Eskom Engineering or done by an internal Engineer, and to be included in the substation's design specification Terms of Reference.

- The design should incorporate storm water management during and post construction.
- The Engineers must integrate the requirements specified by the ecologists for the project as supplied in the EIA Report. The risk maps providing details in terms of the vegetation, rivers and streams, specifically the buffer zones, are supplied in Appendix A of the EIA Report and must be implemented.
- All construction activities (including temporary construction camp site, ablution facilities, etc.) must be limited to sites outside the proposed buffer zones.
- The engineers must take note that no development may take place in any watercourses as described in the National Water Act in the absence of authorisation from the Department of Water and Sanitation. Water Use authorisation, or else if applicable General Authorisation, must be received from the Department prior to commencement of construction.

SERVITUDE AGREEMENTS AND SITE REQUIREMENTS

Independent evaluators must be appointed by Eskom in the process of negotiation in terms of compensation with the relevant landowners. During this process site-specific issues must be addressed that include the following:

- Specific placement of pylons so as not to interfere with farming activities; infrastructure and sensitive environmental features;
- Access and control requirements (i.e. gates, fencing; access roads; etc.);
- Communication channels during ongoing maintenance and inspection of the power line (relevant personnel with contact details; etc.);
- Communication channels emergency situations (i.e. power failures; veld fires; etc.);
- Clearing of vegetation (i.e. selective clearing; what to do with the cuttings (removal or place in heaps for the landowner for firewood; etc.).

Planning and development with regards to agricultural activities

- The time of construction activities planned on agricultural land must be negotiated with the farmer to ensure that construction activities do not unnecessarily interfere with agricultural activities such as harvest time.

Eskom representatives must liaise personally with every directly affected landowner prior to any construction activities taking place. A detailed schedule (inclusive of postal addresses and/or fax and e-mail numbers) of affected landowners and other key stakeholders are included as the Register of Interested & Affected Parties in Appendix E of the Environmental Impact Report. The objectives of this liaison will be the following:

- To identify the most effective time schedule for construction activities to take place on the applicable properties;

- To confirm access routes and Eskom gate localities;
- To confirm site-specific requirements as identified during the EIA process;
- To identify any additional site-specific issues with reasonable mitigatory measures that had not been identified and documented during the Public Participation Procedures of the Environmental Impact Assessment process undertaken for this project;
- To update the contact details of affected landowners in case access to properties are required for both maintenance and emergency situations;
- To confirm the contact details of the contractor and Eskom representatives to ensure effective communication during the construction and operational phases of the project.

Construction workers should wear clearly identifiable clothing that allows for easy recognition of contract workers on private property.

A copy of this EMP must be submitted to relevant landowners should they request it. They can assist Eskom in assuring that the contractor adheres to rules as stipulated and that mitigation measures are applied. They can also assist with measures to ensure that farming activities (if required) can continue under the power line. The exact placement of pylons and the height thereof must be designed to accommodate any spill points, if relevant.

Access roads

Planning of access routes must be done in conjunction between the Contractor, Eskom and the Landowner and must be negotiated in advance. All agreements reached shall be documented in writing and no verbal agreements should be made. The condition of existing access / private roads to be used could be documented with photographs.

ROUTE WALK-DOWN

- It is required that a route walk-down be taken in the presence of the Eskom Engineers; the Ecologist and the Archaeologist once the final route had been confirmed, designed and the draft pylon positions had been determined.
- The purpose of this walk-down is to ensure that all site specific sensitivities are avoided.
- The exact draft pylon positions must be supplied by the design engineers prior to the site investigation. During the walk-down the exact co-ordinates of the proposed pylons in sensitive areas would be confirmed.
- Protected trees that require permits should be marked.
- Cognisance must be taken of the fact that site-specific deviations and/or mitigatory measures might be required by the specialists during this site walk-down and their requirements must be incorporated in the final design of the power line route and substation sites.

FAUNA & FLORA

Protected trees

It is important to take into consideration during the planning phase of the project the fact that the total width of the servitude may not be cleared of protected trees. The Department of Agriculture, Forestry & Fisheries, together with Eskom developed a document in 2012 titled: “Basic Guidelines for the handling of EIAs and License Applications for Eskom SOC Holdings Linear Infrastructure affecting Natural Forests, Protected Trees or State Forests”. According to this document and in relation to new planned Eskom linear infrastructure, “protected trees do not need to be removed from the whole servitude, only from under the lines (this is not necessary for smaller tree species) and trees in the way of towers to be erected”. The Northern Cape is a semi-arid region and unnecessary clearance of vegetation may expose soil, subjecting it to wind erosion that may take many years to recover after disturbance.

A Plant Rescue & Protection Management Plan must be compiled to confirm the permitting requirements of the Northern Cape Department of Environment and Nature Conservation to ensure compliance with the Northern Cape Provincial Act (Act 9 of 2009).

Fauna

Educational programmes for the contractor’s staff must be implemented to ensure that project workers are alerted to the possibility of snakes being found during vegetation clearance. The construction team must be briefed about the management of snakes in such instances. In particular, construction workers are to go through ongoing refresher courses to ensure that threatened snakes, such as Southern African Python, are not killed or persecuted when found.

AVIFAUNA

Nocturnal light emitting diode (LED) mitigation device diverters must be installed on the full span length on the earthwire of each of the spans crossing the Orange River according to Eskom guidelines. These devices are a combination of the basic bird flapper and bird flight diverter concepts, but are equipped with a solar panel which powers flashing LED lights throughout the night to prevent mortalities of bird species flying at night and in thick mist.

FRESHWATER RESOURCES

- The pylons must be constructed within the recommend buffer but not within any of the mapped riparian zone (refer to Appendix A of this EMP). The overhead powerlines may however cross over the buffer zones and the river.

- Construction activities should occur outside of the delineated aquatic features and the proposed buffer zones. These areas should be marked as no-go areas prior to construction.
- Small drainage features also drain the hillside south of the river. These features do not drain into the river and do not provide any aquatic habitat of significance but simply provide a conduit for water draining the steep bank south of the Orange River. These drainage lines should preferably be avoided.

HERITAGE / CULTURAL RESOURCES

- No sites of cultural heritage significance are located in the surveyed area, but many stone tools have however been noted.
- A site walk-down with the cultural-heritage consultants is required once the pylon positions have been determined. The way forward in terms of further action in terms of the stone tools will be determined during this survey. The latter would aim at collection a representative sample of stone tools from the area since it is terra incognita as far as research goes and would therefore assist in elucidating this part of history.
- It should always be realised that the subterranean presence of archaeological and/or historical sites, features or artefacts is a distinct possibility and it could be found during the course of construction work. Care should therefore be taken, when development work commences, that if any of these are accidentally discovered, a qualified archaeologist be called in to investigate. The results of such an investigation should be submitted to SAHRA.

VISUAL IMPACT

- It is suggested that trees should be planted along the eastern side of the substation. The trees will partially shield / screen the view of people living east of the project site.
- The negative impact of night lighting, glare and spotlight effects, can be mitigated using the following methods:
 - Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds of the substation.
 - Light public movement areas (pathways and roads) with low level ‘bollard’ type lights and avoid post top lighting
 - Avoid high pole top security lighting along the periphery of the substation site and use only lights that are activated on movement at illegal entry to the site.
 - Use security lighting at the periphery of the site that is activated by movement and are not permanently switched on.

IMPACT ON LANDOWNERSHIP AND LAND CLAIM

It was confirmed that there is a valid claim from the Richtersveld Community on the two properties concerned and that a notice was gazetted on 29 August 2008 with reference number KRK6/2/2/A/1/0/0/37(R323).

Moketla Mamabolo Attorneys advised the following:

- Once a notice of the claim in respect of any land had been published in the Gazette, specific restrictions apply that includes that no person may sell, exchange, donate, lease, subdivide, rezone or develop the land in question without having given the regional land claims commissioner one months' written notice of his or her intention to do so. The Regional Land Claims Commissioner has 30 days in which to approach the court for an interdict.
- From a legal point of view, nothing is contained in the Act to preclude the Environmental Impact Assessment process to run its course, however, the notification step to the Regional Land Claims Commissioner is of fundamental importance that it be issued as required by the Act.

Action to be taken

- Eskom must notify the Regional Land Claims Commissioner of the intent to develop the property, as per advice in the previous paragraph.
- Eskom must ensure that all legal requirements in terms of the land claim is met.

COMPLIANCE WITH SPECIFICALLY IDENTIFIED LEGAL REQUIREMENTS

The National Water Act (Act No 36 of 1998)

Water Use Authorisation in terms of the National Water Act (Nr 36 of 1998) is required for the crossing of the river. The Risk Assessment Matrix provided by the Department of Water and Sanitation was used in the assessment of the risk posed to the aquatic ecosystems by the proposed project. It was concluded that the proposed activities pose a low risk to the aquatic ecosystems for both the Construction and Operational & Maintenance Phases of the project.

The regulation relating to General Authorisations for Section 21 (c) and (i) water uses has been revised so that General Authorisation in terms of the Water Act could therefore be relevant to this project because of the low risk rating.

Surface and/or groundwater pollution incidents that may possibly occur must be dealt with in accordance with Section 19 and 20 of the National Water Act, 1998.

Should there be any deviations from the EMP or any incident or potential incident that might impact on any water resources, the Department of Water & Sanitation must be notified immediately.

National Forest Act, Act 84 of 1998 (NFA) as amended, Section 12(1(d) read with section 15(1) and section 62(2)(c).

The Directory: Forestry Management in the Department of Agriculture, Forestry and Fisheries (DAFF) is mainly concerned about the potential impact on protected tree species. The most recent list of protected tree species was published in GN 908 of 21 November 2014. *No protected tree may be damaged, disturbed, cut or destroyed without a valid Forest Act license, irrespective of other authorisations and approvals.*

Trees are protected for a variety of reasons, and some species require strict protection while others require control over harvesting and utilisation. DAFF will have to be approached to obtain the required permits for the removal / cutting of any protected tree species.

National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

Declared alien invasive species, if found on site, must be removed according to the principles as stipulated in this Act.

CONSTRUCTION SITE

- Accommodation for labourers must either be limited to guarding personnel on the construction site (with labourers transported daily to and from the site) or a separate fenced and controlled area where proper accommodation and relevant ablution and washing facilities are provided.
- The location of the construction site must be negotiated with the relevant landowner and specifications of the landowner must be adhered to.
- The construction site office and storage areas for material and equipment must be fenced in to prevent impacts and human interference to spread further than the site.
- Storage facilities for construction equipment must be provided for.
- Encourage the construction contractor to employ local people as far as is reasonably practical and encourage the contractor to transport them daily to and from the site. This would reduce solid and liquid waste production and water demand at the site camps.
- Contractors should develop a comprehensive site camp management plan. This should apply even in the case of the limited accommodation camps as discussed above.
- Plan site campsites an appropriate distance from any facility where it can cause a nuisance and could cause a safety hazard (in terms of mining activities such as blasting).
- Minimise on-site storage of petroleum products.
- Ensure proper maintenance procedures in place for vehicles and equipment.
- Servicing of vehicles to be in designated areas with appropriate spill management procedures in place.
- Ensure measures to contain spills readily available on site (spill kits).
- Sufficient ablution and proper cooking facilities must be provided at the site camp.

- Deposit solid domestic waste in containers and dispose at municipal waste disposal sites regularly.
- Dispose of liquid waste (grey water) with sewerage.
- Install appropriate facilities at the campsite. Preferably utilise municipal systems (conservancy tanks with periodic removal) or chemical toilets.
- Ensure compliance with stringent daily clean up requirements of site camp inert waste (waste concrete, reinforcing rods, waste bags, wire, timber etc) and dispose at municipal waste disposal sites.

FIRE MANAGEMENT

Eskom will manage the fire risk within the servitude from a fire risk point of view and the field service office will be in close communication with the fire protection agency in the area. Reducing the vegetation load and managing the alien vegetation will also contribute to the prevention and the spreading of fires. The servitude itself can in many cases act as fire break within the landscape.

The following are applicable to both the construction and operational phases:

- No fires may be made for the burning of vegetation and waste, neither as source of heat or cooking.
- No open fires are to be made on site – cooking facilities must be provided, particularly for security staff.
- Branches and other debris resulting from pruning processes should not be left in areas where it will pose a risk to infrastructure.
- Fires shall not be made for the purpose of chasing or disturbing any fauna.
- The adjacent landowners must be informed and/or involved in case of any fire that may pose a threat to their properties.
- It must be ensured that the basic firefighting equipment is supplied to all living quarters, site offices, kitchen areas, workshop areas and stores and be kept available during construction phase.
- Welding gas cutting or cutting of metal will only be allowed inside the working/demarcated areas and with appropriate firefighting equipment at hand.

APPOINTMENT OF CONTRACTORS

- The EMP will be made binding on all Contractors operating on the site and will be included in contract documents of all appointed contractors. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

- All identified site specific measures as determined during the Environmental Impact Assessment process for a specific property must be considered and implemented during the construction phase of this project.
- The appointment of contractors with proven track records of sound environmental performance should be given priority.
- The contractor must ensure that, as far as possible, the majority of unskilled labour is obtained from the local residents in the macro area.
- The contractor must ensure that he is well aware of the implications of and must ensure compliance with the following legal requirements, guidelines and policies:
 - All relevant Eskom standards, specifications and procedures to manage the significant aspects with regards to oil management, bush clearing, entrance of private property, etc.
 - Requirements in terms of removing cutting and/or trimming of protected trees in terms the Forest Act (Act 122 of 1984).
 - All Sections and Regulations of the National Water Act, 1998(Act 36 of 1998) must be complied with; specifically specifications as described in Section 19 on Pollution and Waste.
 - Environmental Best Practice Guidelines and Specifications, compiled by the Department of Water Affairs.
 - Legislation with regard to graves that is included in the National Heritage Resources Act (No 25 of 1999). It should be noted that the act also distinguishes between various categories of graves and burial grounds. Other legislation with regard to graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended).
- The contractor must be aware that all waste material generated during and after construction should be disposed of at a permitted landfill site and an agreement letter between the municipality and the contractor regarding the disposal of such waste material should be obtained.

Method Statement

- On request of the Engineer and/or ECO, the Contractor must compile a Method Statement in such detail that the Engineer/ECO will be able to assess whether the Contractor's proposal is in accordance with the stipulations as per the EMP and/or will produce results in accordance with the EMP stipulations. The Method Statement shall cover applicable details with regard to:
 - construction procedures,
 - materials and equipment to be used,
 - getting the equipment to and from site,
 - how the equipment/ material will be moved while on site,
 - how and where material will be stored,
 - the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur,
 - timing and location of activities,

- any other information deemed necessary by the Engineer/ECO (i.e. detail with regards to ablution facilities; storage, handling and disposal procedures of all hazardous materials to be stored on site; management of contaminated water, etc.).
- The Contractor may not commence the activity until the Method Statement has been approved.
- The Engineer/ECO may require changes to the Method Statement if the proposal does not comply with the stipulations or if, in the reasonable opinion of the Engineer/ECO, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment in excess of that permitted by the EMP or other applicable legislation.
- Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel.
- The Contractor shall carry out the works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract.

CONSTRUCTION PHASE

GROUND AND SURFACE WATER

- In all cases, abstraction of water from watercourses for construction purposes will not be allowed. Arrangements must be made prior to construction with the landowners or municipal water must be carted in.
- Under no circumstances must surface or groundwater be polluted.
- Adequate oil containment precautions must be taken.
- If a spill from a construction vehicle occurs it must be reported to ECO with immediate effect. A bio-remediation contractor must be appointed to rehabilitate large oil spills. Small oil spills must be cleaned immediately with an oil spill kit. Spills must be immediately stopped and a drip tray be used to catch any leaks until the risk can be eliminated and mitigation/rehabilitation measures applied
- Minimise on-site storage of petroleum products.
- Ensure proper maintenance procedures are in place for vehicles and equipment.
- Servicing of vehicles to be done in designated areas with appropriate spill management procedures in place.
- Ensure that measures to contain spills are readily available on site (spill kits).
- All hazardous substance spills must be reported, recorded and investigated.
- All stormwater runoff must be managed efficiently so as to avoid stormwater damage and erosion to adjacent properties.
- During and after construction, stormwater control measures should be implemented especially around stockpiled soil, excavated areas, trenches etc. to avoid the export of soil into any watercourse.
- Stormwater should not be discharged into the working areas and it should be ensured that stormwater leaving the footprint of the proposed development areas is not contaminated by any substance, whether that substance is solid, liquid, vapor or any combination thereof.
- Stockpiling of construction material and soils should be such that pollution of water resources is prevented and that the materials will be retained in a storm event.
- Drinking water and water for ablution facilities must be provided to all construction workers on the construction site.

RIVERS AND STREAMS

All conditions of the Department of Water and Sanitation in the Water Use License or General Authorisation (whichever is applicable) must be implemented and adhered to.

Direct modification or loss of aquatic habitat

- As far as possible existing access roads should be utilised to minimise the extent of disturbance in the area. Access roads should be contoured along any steep slope. Run-off over the exposed areas and within the drainage lines should be mitigated to reduce the rate and volume of run-off and prevent erosion.
- Any of the cleared areas that are not hardened surfaces should be rehabilitated after construction is completed by re-vegetating the areas disturbed by the construction activities with suitable indigenous plants.

Potential flow impact

- Invasive alien plant growth occurring within the immediate area of the construction activities should be removed and any regrowth prevented.
- As far as possible existing access roads should be utilised to minimise the extent of disturbance in the area. New access roads should be contoured along any steep slope. Run-off over the exposed areas and within the drainage lines should be mitigated to reduce the rate and volume of run-off and prevent erosion.
- Any of the cleared areas that are not hardened surfaces should be rehabilitated after construction is completed by re-vegetating the areas disturbed by the construction activities with suitable indigenous plants. Invasive alien plant growth occurring within the immediate area of the construction activities should be removed and any regrowth prevented.

Water quality impact

- Contaminated runoff from construction should be prevented from entering the river. All materials on the construction site should be properly stored and contained. Disposal of waste from the site should also be properly managed. Construction workers should be given ablution facilities at the construction site that are located outside of the recommended buffer for the river and regularly serviced.
- Contaminated runoff from construction should be prevented from entering the river. All materials on the construction site should be properly stored and contained. Disposal of waste from the site should also be properly managed. Construction workers should be given ablution facilities at the construction site that are located outside of the recommended buffer for the river and regularly serviced. These measures should be addressed, implemented and monitored in terms of the Environmental Management Plan for the construction phase.

- Maintenance of infrastructure related to the project should only take place via the designated access routes. Disturbed areas along the access routes should be monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth.

WASTE MANAGEMENT

General Waste

- Expected constructed waste (unused steel, conductor cables, cement or concrete) and general waste around the construction site (plastic, tins and paper) may degrade the environment if not disposed in the correct manner.
- Littering or illegal dumping of any waste material is prohibited.
- No waste disposal holes may be made on site.
- Under no circumstances should waste be burnt on site.
- Waste separation should be encouraged for recycling purposes.
- Provision must be made for the collection of all general waste materials. Rubbish bags and bins with lids must be provided at various points within the construction corridor and must be emptied on a regular basis.
- Deposit solid domestic waste in containers and dispose at registered municipal waste disposal sites regularly.
- For all waste that is disposed of, Eskom shall obtain waste manifests and disposal certificates, which shall be recorded and reported to the ECO on a monthly basis.
- Liquid waste (grey water) must be disposed with sewerage.

Construction Waste

- Ensure compliance with stringent daily clean up requirements of site camp inert waste (waste concrete, reinforcing rods, waste bags, wire, timber etc) and dispose at municipal waste disposal sites.
- Construction waste must be collected and sold for recycling purposes as far as possible.

Sewage

- Portable ablution facilities must be placed within the construction servitude and must be serviced by registered companies only and on a regular basis. There should be one toilet for every fifteen workers.
- No effluent to be dumped in the veld or any watercourse.
- The use of the open veld for ablution is prohibited.

Hazardous Waste

- Oil contaminated waste (soil, cloths used to clean small spills, spill kits, content of drip trays, etc.) must be disposed of at a facility that is registered as a hazardous landfill facility.

- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled. All these hazardous substances should be disposed of at a H:H registered waste disposal facility.
- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- Persons who remove hazardous waste must be appropriately qualified and authorised.
- If diesel/petrol refuelling is to take place on the site a special area must be demarcated for this purpose. This area should be paved with an underlying layer that will prevent leakages or spills from reaching the subsurface soil or underground water table.
- No refuelling of any vehicle is allowed within the power line corridor or in the adjacent natural areas.

PREPARATION OF SERVITUDE / VEGETATION CLEARANCE

- The procedures for vegetation clearance and maintenance within overhead power line servitudes and on Eskom owned land, updated September 2009 or latest approved revision thereafter, must be implemented (EPC 32-247).
- Vegetation clearance is often one of the very first activities of construction. The Project Coordinator shall inform the ECO before the vegetation clearance contract is issued. Vegetation clearance is considered commencement of construction. Eskom needs to notify the DEA of its intention to commence with construction before vegetation clearance can commence.
- The object of vegetation clearing is to trim, cut or clear the minimum number of trees and vegetation necessary for the safe mechanical construction and electrical operation of the transmission line.
- Indigenous vegetation which does not interfere with the safe operation of the power line should be left undisturbed.
- Clearing for pylon positions must be done to the minimum required for that specific pylon.
- Vegetation clearing during construction must be restricted to the footprint of the substation infrastructure only and the power line servitude.
- No scalping shall be allowed on any part of the servitude road unless absolutely necessary.
- Any alien invasive trees with large root systems shall be cut manually and removed, as the use of a bulldozer will cause major damage to the soil when the root systems are removed. Stumps shall be treated with herbicide. Smaller vegetation can be flattened with a machine, but the blade should be kept above ground level to prevent scalping.
- Any vegetation cleared on a tower site shall be removed or flattened and not be pushed to form an embankment around the tower.
- Disturbed areas of natural vegetation as well as cut and fills must be rehabilitated immediately to prevent soil erosion as well as alien invasive vegetation invasion. This is especially relevant adjacent to the non-perennial drainage lines and seasonally inundated depressions.

- *Herbicides*
 - The use of herbicides shall only be allowed after a proper investigation into the necessity, the type to be used, Eskom's approval for the use of herbicides is mandatory. Application shall be under the direct supervision of a qualified technician. All surplus herbicide shall be disposed of in accordance with the supplier's specifications. All alien vegetation in the total servitude and densifiers creating a fire hazard shall be cleared and treated with herbicides.
 - It is recommended that a contractor for vegetation clearing should comply with the following parameters:
 - The contractor must have the necessary knowledge to be able to identify protected species Camel Thorn (*Vachelia (Acacia) erioloba*); as well indigenous species not interfering with the operation of the line due to their height and growth rate.
 - The contractor must also be able to identify declared weeds and alien species (*Prosopis glandulosa**, *Nicotiana* spp.) that can be totally eradicated.
 - The contractor must be in possession of a valid herbicide applicators license.
- *Access roads*
 - Existing access roads must be used as far as possible and the creation of new access tracks for power line construction should be minimised.
 - Unnecessary impacts (such as driving off road) on surrounding natural vegetation must be avoided.
 - The Contractor shall properly mark all access roads. Markers shall show the direction of travel as well as tower numbers to which the road leads.
 - Unnecessary traversing of adjacent open areas is discouraged especially within the open woodlands, open grasslands, non-perennial drainage lines and seasonal wetlands including Kalahari Salt Pans.
 - Where required, speed limits shall be indicated on the roads. All speed limits shall be strictly adhered to at all time.
 - Vehicle access to the powerline servitude must as far as possible be limited to existing roads. If a new access roads need to be constructed it should follow cleared areas such as livestock pathways where possible.

CONTROL OF ALIEN VEGETATION

- Alien vegetation in servitudes shall be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. In terms of these regulations, Eskom shall "control" i.e. to combat Category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by Eskom.

- The use of herbicides shall be in compliance with the terms and conditions of The Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947).
- All alien vegetation should be eradicated along the servitude. Invasive species (*Prosopis glandulosa*; *Nicotiana* spp.) should be given the highest priority.
- No dumping of any materials in undeveloped open areas and neighbouring properties.
- Activities in the surrounding open undeveloped areas (especially the rocky hills and koppies must be strictly regulated and managed.
- It is imperative that the construction activities as well as vegetation clearance are restricted to the powerline servitude. The limitation of the disturbance of vegetation cover within the servitude will ameliorate this impact.

PROTECTION OF FAUNA AND FLORA

- No animals or birds may be fed, disturbed, hunted or trapped. Severe contractual fines must be imposed and immediate dismissal on any contract employee who is found attempting to snare or otherwise harm remaining faunal species.
- No plant material may be removed if not part of identified vegetation clearance.

Vegetation

- Close site supervision must be maintained during construction.
- Workers must be limited to areas under construction within the corridor and access to the undeveloped areas, especially the surrounding open areas must be strictly regulated (“no-go” areas during construction activities).
- Provision of adequate toilet facilities must be implemented to prevent the possible contamination of ground (borehole) water in the area.
- All temporary stockpile areas including litter and dumped material and rubble must be removed on completion of construction. All alien invasive plant should be removed from the site to prevent further invasion.
- Contract employees must be educated about the value of wild animals and the importance of their conservation.
- All vegetation not interfering with the operation of the line shall be left undisturbed
- Collection of firewood and traditional medicinal plants is strictly prohibited.
- All alien vegetation should be eradicated along the corridor.
- Where herbicides are used to clear vegetation, specimen-specific chemicals should be applied to individual plants only. General spraying should be prohibited.

Rehabilitation

A suitably qualified rehabilitation specialist should be appointed for the commencement of vegetation rehabilitation activities. The specialist should identify areas requiring rehabilitation as well as appropriate seed mixes which are required. Photographic records of the servitude and

access roads prior to construction activities and after the construction phase will be taken to assess the level of rehabilitation and re-vegetation.

Mammal management recommendations

- All large indigenous tree species should be conserved wherever possible as they form important habitat for arboreal mammal species.
- Activities should be restricted away from any rocky hills and outcrops as well as riparian habitats along the non-perennial drainage lines.
- Interference with any wildlife without the applicable permits shall not be allowed.
- No hunting or poaching activities must be allowed along the servitudes during all phase of the project.

Reptile management recommendations

- No rock removal should occur adjacent to the proposed towers. No termite mounds should be intentionally destroyed. If any moribund termite mounds have to be destroyed due to tower position it should be carefully excavated by hand and pick.
- Any animals rescued or recovered will be relocated in suitable habitat away from the transmission towers and line.
- Trees including stumps; bark and holes in trees are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors).
- Exotic cleared vegetation should form wood piles and logs and stumps. Dead or decaying wood piles should be created as these will provide valuable refuge areas especially due to the clearance of vegetation cover. Logs and stumps also provide important habitats for several reptile species as well as smaller mammals, amphibians, arachnids and scorpions. With time they will eventually be reduced to valuable compost by several animal species.
- Any lizards, gecko's, agamids, monitors or snakes encountered should be allowed to escape to suitable habitat away from the disturbance. No reptile should be intentionally killed, caught or collected during any phase of the project.
- Several venomous snake species could occur along the proposed lines including Cape Cobra (*Naja nivea*) and Puff Adder (*Bitis arietans*).
- General avoidance of snakes if the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area.
- Appropriate foot wear (sturdy leather boots) should be worn in the field.

Amphibian management recommendations

- Construction activities should be restricted to daylight hours reducing the potential impact on the nocturnal breeding activities of the majority of amphibian species.

AVIFAUNA

Nocturnal light emitting diode (LED) mitigation device diverters must be installed on the full span length on the earthwire of each of the spans crossing the Orange River according to Eskom guidelines. These devices are a combination of the basic bird flapper and bird flight diverter concepts, but are equipped with a solar panel which powers flashing LED lights throughout the night to prevent mortalities of bird species flying at night and in thick mist.

For the restriction and/or prevention of disturbance to birds and destruction of their habitat, the following will apply:

- Disturbance to and killing of birds must be prevented.
- Unnecessary habitat destruction must be avoided.
- The removal of large trees should be avoided if at all possible.
- Construction activity should be restricted to the immediate footprint of the infrastructure. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.
- Measures to control noise should be applied according to current best practice in the industry.
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
- The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.
- All dismantling, construction and maintenance activities must be carried out according to best environmental practice principles so as to minimise habitat destruction (see in this respect the Eskom Environmental Procedure, EPC 32-96). The unnecessary removal of large trees is not allowed (see also in this respect the Procedure for Vegetation Clearance and Maintenance within Eskom owned land, EPC 32-247).

VISUAL IMPACT

- Mitigation during the construction phase is possible but it revolves mainly around 'good housekeeping' i.e. suppression of dust at the substation site and along access roads during construction.
- It is proposed that as little vegetation as possible be removed during the construction phase.
- Ensure, wherever possible, all existing natural vegetation is retained and incorporated into the project site rehabilitation (bosque of trees to the south of the site).
- Dust suppression techniques should be in place always during the construction, operational, the decommissioning / closure phases.
- Only the footprint and a small 'construction buffer zone' around the proposed project should be exposed. In all other areas, the natural vegetation should be retained.

- It is suggested that trees should be planted along the eastern side of the substation. The trees will partially shield / screen the view of people living east of the project site.
- During construction, operation, rehabilitation and closure of the Project, access roads will require an effective dust suppression management programme, such as the use of non-polluting chemicals that will retain moisture in the road surface.

SOIL EROSION

- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969.) Access roads and site surfaces must be monitored for deterioration and possible erosion. Pro-active measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil erosion.
- All cleared areas must be ripped and rehabilitated after construction. The top 200mm layer of topsoil must be removed and stockpiled in heaps not higher than 2m and replaced on the construction areas once the activities have been completed. The affected areas should be replanted with a grass mixture indigenous to the area.
- All vehicle movement must be along existing roads or tracks as far as possible.
- All stormwater runoff must be managed efficiently so as to avoid stormwater damage and erosion to adjacent properties.
- The viability of undertaking construction during the dry months of the year should be investigated in order to overcome possible problems caused by excessive moisture.
- Should any new temporary access roads be required, the following should apply in areas which are prone to erosion:
 - Where a cutting is made, subsoil drains should be installed wherever a perched water table occurs within 900m of the formation in all cuttings and below fills in the alluvial zones.
 - It is further critical to manage surface water. Drains should be provided along the top and bottom of all deep cuttings. This is to minimise the flow of surface water and erosion to the exposed cut faces and erosion along the toe of the cuttings.
 - Steep sections of the service road must be supplied of sufficient drainage areas to reduce flow velocity of run-off water.
 - Any eroded sections must be rehabilitated and part of the management plan must include regular inspections of the water run-off areas.
- If any erosion occurs, rehabilitation must immediately be done.

COMMUNITY ISSUES (SAFETY, SECURITY, NOISE, DUST, ETC.)

- Farm gates and fences must be left in the state it was found.

- Under no circumstances shall access be gained by cutting or “dropping” of fences. All gates shall be left closed and the Eskom servitude gates shall be securely locked at all times.
- Construction workers must be extremely careful not to damage any property along the proposed route. Should any damage occur it should be reported to the ECO and repaired and to a state prior to the damage to the written satisfaction of the landowner and ECO.
- Removal of agricultural products is prohibited.
- No firewood may be collected.
- No open fires are to be made on private property.
- In order to prevent and/or minimise crime, it is required that all construction workers be supplied with controlled serviced accommodation or be supplied with daily transport to and from the site.
- No wandering on adjacent properties is allowed, unless written consent has been obtained from the relevant landowners.
- All adjacent landowners have to be informed of the blasting programme (if applicable) prior to any blasting taking place. Contractors must liaise personally with adjacent landowners. All communication in this regard must be documented. Blasting may only be undertaken by specialists in the field and should be limited to small localised areas. All relevant legislation must be adhered to.
- All construction workers will be allowed only for specified day light hours. Transport should be made available by the contractor to remove labourers from the site after working hours.
- Secure accommodation facilities must be provided for guarding personnel.
- Supervision of labourers must at all times take place.
- Construction hours will be restricted to specific periods that exclude Sundays and public holidays.
- Sweeping of construction sites, clearing of building rubble and debris and watering of construction sites (storage areas, roads, etc.) must take place on a regular basis.
- All excavated areas must be clearly marked and barrier tape must be placed around them to prevent humans and animals from falling into them.

AGRICULTURAL ACTIVITIES

Domestic Livestock

- The Contractor’s workforce will have to be very careful not to disturb the animals as this may lead to fatalities which will give rise to claims from the Landowners.
- The Contractor shall under no circumstances interfere with livestock without the Landowner being present. This includes the moving of livestock where they interfere with construction activities.
- Should the Contractors workforce obtain any livestock for eating purposes, they must be in possession of a written note from the Landowner.

- Speed limits must be restricted especially on dirt roads preventing unnecessary road fatalities of surrounding livestock.

CULTURAL-HISTORICAL COMPONENT

Should any evidence of archaeological sites or remains not previously identified (e.g. remnants or stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal/ash concentrations), unmarked human burials or other categories of heritage resources are found during construction activities, SAHRA APM Unit (Mr Philip Hine or Mrs Colette Scheermeyer, tel 021 462 4502) must immediately be alerted and an accredited professional archaeologist must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological significance, a Phase 2 rescue operation might be necessary.

POST-CONSTRUCTION & OPERATIONAL PHASE

SOIL EROSION

- Specifications for topsoil storage and replacement to ensure sufficient soil coverage as soon as possible after construction activities must be implemented.
- All embankments (if any) must be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.
- After construction, all temporary access roads should be rehabilitated.
- The site must be rehabilitated and replanted with suitable, indigenous grass to prevent erosion where necessary.
- The eradication of alien vegetation should be followed up as soon as possible by replacement with indigenous vegetation to ensure quick and sufficient coverage of exposed soil.

CONSTRUCTION SITE CLEARANCE

- After construction all building material, signs of excess concrete, equipment, houses, ablution facilities, building rubble, refuse and litter must be removed and cleaned up from the construction site as well as from the store room by the contractor.
- Items that can be used again should be recycled. Unusable waste steel and aluminium to be managed according to Eskom procedures.
- Once construction is completed, the contractor has to obtain written consent from the relevant landowner that the construction site, construction areas, access routes, etc. are sufficiently and adequately rehabilitated to the landowners' satisfaction.

COMMUNITY ISSUES

- All complaints received with regards to poor conduct of Eskom personnel, malfunction of or damage to Eskom structures, bird killings as a result of electrocutions and/or collisions, etc. will be investigated by Eskom in cooperation with all the relevant stakeholders.
- Eskom to manage complaints as per GTX line and or direct Eskom personnel on site or contractor site representative. All complaints will be managed according to Eskom existing measures such as 32 – 95.
- A list of all names, telephone numbers and addresses of the relevant Eskom employees, contractors and all affected landowners must be compiled, regularly updated and must be

available in case of emergency and where access is required for maintenance and debushing purposes.

- No wandering on adjacent properties is allowed, unless written consent has been obtained from the relevant landowners.
- Once construction is completed, the contractor has to obtain written consent from the relevant landowners that the construction site, construction areas, access routes, etc. are sufficiently and adequately rehabilitated to the landowners' satisfaction.

FRESHWATER RESOURCES

- It is important that any of the cleared areas that are not hardened surfaces are rehabilitated after construction is completed by re-vegetating the aquatic features and their associated buffer areas disturbed by the construction activities with suitable indigenous plants.
- Clearing of debris, sediment and hard rubble associated with the construction activities should be undertaken post construction to ensure that flow within the drainage channels are not impeded or diverted.
- All crossings over drainage channels or stream beds after the construction phase should be rehabilitated such that the flow within the drainage channel is not impeded.
- Maintenance of infrastructure related to the project should only take place via the designated access routes and multiple crossings over streams and rivers should not be established.
- Disturbed areas along the access routes should be monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth.
- Maintenance personnel must be provided with proper ablution and cooking facilities at all times.

AVIFAUNA

Regular monitoring for bird collisions along the line should be undertaken and should there be bird mortalities as result of collisions, appropriate steps must be taken to improve mitigation measures.

AGRICULTURAL ACTIVITIES

Maintenance programmes should be negotiated with the relevant landowners to ensure that farming activities are not unnecessarily impacted on.

VEGETATION MAINTENANCE OF THE SERVITUDE

The management of alien vegetation is governed by Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. In terms of these regulations, Eskom must “control” i.e. to combat Category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by Eskom.

FIRE RISK MANAGEMENT

- The existing complaints structure must be revised by Eskom and be updated on a regular basis and communicated with all the affected landowners to ensure effective response and service supply.
- The contact details of all affected landowners as well as relevant Eskom staff must be listed, updated regularly and distributed to all stakeholders to ensure effective communication in the case of emergencies such as veld fires.
- Branches and other debris resulting from pruning processes should not be left below conductors or in areas where it will pose a risk to infrastructure.
- Debris shall not be burnt under any circumstances.
- Fires shall not be made for the purpose of chasing or disturbing any fauna.
- Eskom encourages affected landowners and maintenance staff to participate in the Fire Protection Agency.
- Eskom must engage with applicable organisations within environmentally / fire sensitive areas. Together they should compile the most effective fire management plan for the specific affected area.

IMPACT RESULTING FROM ESKOM INSPECTIONS AND MAINTENANCE

This impact is associated with Eskom maintenance personnel and/or outside contractors appointed to inspect the Eskom structures. Impact that could potentially occur is destruction of habitat (i.e. cutting of trees for firewood); illegal placement of snares, increased crime and safety risk to adjacent landowners, etc.

Actions to be taken

- Maintenance workers must be extremely careful not to damage any property along the proposed route. Should any damage occur it should be reported to Eskom for immediate action and rectification. .
- Removal of agricultural products is prohibited.

- No firewood may be collected.
- No open fires are to be made on private property.
- No wandering or entering on adjacent properties is allowed.
- All maintenance workers will be allowed only for specified day light hours. Transport should be made available by the contractor to remove labourers from the site after working hours.
- Secure accommodation facilities must be provided for guarding personnel.
- Supervision of maintenance contractors must at all times take place.
- Maintenance of infrastructure related to the project should only take place via the designated access routes.
- Disturbed areas along the access routes should be monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth.

ACCESS AND SERVITUDE MAINTENANCE ROADS

General

- Eskom access and maintenance roads may only be used for its intended purpose - the use of these roads for any other purpose is prohibited.
- Drivers must stay within the speed limit in order to ensure the safety of other road users.
- All general SA road safety rules and regulations will apply while driving on Eskom's access and maintenance roads.
- Access to the power line route shall be by means of approved access roads only. No unauthorised access is permitted.
- Off-road driving is strictly prohibited.
- Should any road be damaged by Eskom, the applicable landowner should immediately be informed and remedial action should be done as soon as possible.
- Eskom personnel should treat private property with respect at all times, for example gates should be lock after entering and exiting, no fauna or flora may be destroyed, killed or collected, the veld may not be used for ablution facilities and swimming in any natural or manmade water features are prohibited.
- The type of vehicle used should be conducive to the road condition; only 4x4 vehicles will be allowed on 4x4 roads. Where at all possible, 4x4 driving should not take place in wet conditions as this can easily cause additional damage to the road.

Speed limit

- A maximum speed limit of 40km/h should be adhered to when driving on gravel (i.e. 2 wheel track) roads.
- The driving speed should be appropriate to the road conditions at all times. This could ensure the safety of the driver, other occupants as well as surrounding properties.

- Follow the Eskom speed limit of 60km on gravel roads where applicable. The speed limit should not exceed 40km for construction vehicles.

Dust Control

- Speed limits must be strictly adhered to in order to limit the levels of dust pollution.
- Should any complaints from landowners be received (i.e. dust on crops), Eskom should attend to it immediately and appropriate dust control measures should be discussed with the landowners and implemented (i.e. speed calming measures).

Erosion

- Should any signs of erosion be evident along the access and maintenance roads, remedial action should take place as soon as possible.
- In areas prone to erosion, soil berms could be placed on the roads at convenient intervals, not exceeding a height of 0,5m, to curtail the speed and erosion potential of any stormwater flowing across the gradient of the site. This could be applicable to roads on steep slopes.

Monitoring

- Eskom personnel must be made aware of general acceptable road conditions, especially gravel roads and deviations should be reported to Eskom's Environmental Management. Access and maintenance roads must be monitored for deterioration and possible erosion at all times.
- Should any road works / rehabilitation be required, monitoring thereof should take place, especially during the rainy season to ensure the effectiveness thereof.
- Adhere to Farm Access procedure at all times.

MONITORING PROGRAMMES

- Inspection of the servitude should include monitoring of the servitude line during the Post-Construction and the Operational Phase to detect any potential erosion problems timeously. Mitigatory measures should immediately be identified and implemented by Eskom in cooperation with the landowner.
- Any incidents resulting from Eskom structures and operation that might have a detrimental impact on the environment will be investigated and measured and, if applicable, will be identified in close cooperation with the affected parties and/or stakeholders and be implemented and monitored accordingly.
- Eskom must at all times follow this EMP for maintenance and operational practices to ensure consistent, effective and safe performance of the infrastructure.

APPENDIX A

Requirement in terms of Avifauna

The site is located 10km upstream from the Important Bird Area (IBA) called the Orange River Mouth Transboundary Ramsar Site.



Bird flight diverters with OWL devices (LED lights) for Flamingo's must be fitted on the earth wires. Liaison with Endangered Wildlife is required.



APPENDIX B

Requirement in terms of Fauna and Flora

The results of a sensitivity analysis indicate that the two relevant vegetation units have a medium ecological sensitivity to disturbance.

The medium sensitivity is mostly due to the sparse vegetation cover, low number of medicinal plants and low area fragmentation. *It does not mean that the area has a low conservation value and ecosystem functioning, but rather that certain types of development can be tolerated and if properly mitigated it should have little negative impact.*

Ecological Sensitivity of the different vegetation units (if properly mitigated) along the proposed corridor based on the data and the sensitivity analyses (source: Google Earth 2015)



Yellow = Low sensitivity

Orange = Medium sensitivity

Critical issues for action prior to commencement of construction

- Site walkdown with the ecologist is required once the pylon positions have been determined.
- A Plant Rescue & Protection Management Plan must be compiled to confirm the permitting requirements of the Northern Cape Department of Environment and Nature Conservation to ensure compliance with the Northern Cape Provincial Act (Act 9 of 2009).

APPENDIX C

Requirement in terms of the Aquatic and Riparian Area

Eskom has indicated that they will be unable to achieve the span of approximately 1000m required for the pylons to remain outside of the river channel, its riparian zone and the recommended buffer areas. The river and riparian zones within the corridor assessment ranges from approximately 825m to 1200m in width. The proposed crossing should take place within the corridor where the mapped river channel and riparian zone does not exceed 950m. This would imply that the pylons would be located within the recommend buffer but not within any of the mapped riparian zone.

The applicant is required to obtain a Water Use License or General Authorisation for the activity from the regional office of Department of Water and Sanitation. The relevant listed activities are :

Section 21 (c) Impeding or diverting the flow in a watercourse
 Section 21 (i) Altering the bed, banks, course or characteristics of a watercourse

