



ESKOM HOLDING LIMITED

TRANSMISSION SERVICES

**FINAL ENVIRONMENTAL MANAGEMENT
PLAN**

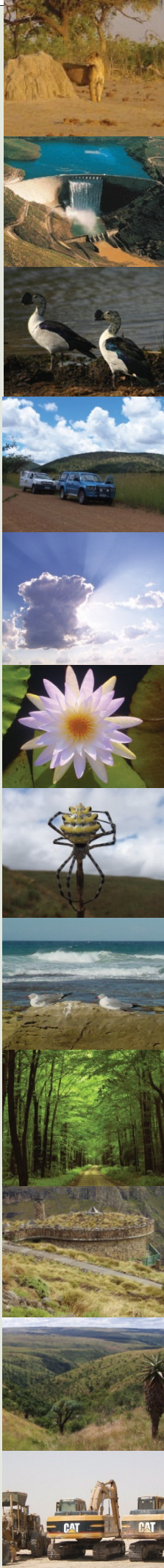
**Project Name: Proposed Tabor Witkop
400kV Transmission Power Line**

Date: September 2010

DEA Ref No: 12/12/20/857



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Management**

DOCUMENT CONTROL

PROPOSED TABOR - WITKOP 400KV TRANSMISSION POWER LINE, LIMPOPO PROVINCE

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REVISION AND AMENDMENTS

DATE	No.	DESCRIPTION OF REVISION OR AMENDMENT
18 October 2010	0	Draft EMP for the proposed tabor to Witkop Transmission Power Line
26 October 2010	1	Final EMP for the proposed tabor to Witkop Transmission Power Line

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1. INTRODUCTION

The construction of transmission power lines can have a major impact on the environment. It is thus imperative that sufficient precautions be taken to ensure that environmental damage is minimised. This will take a concerted effort from the project team and proper planning is of the utmost importance.

An Environmental Impact Assessment was undertaken for this project and the Record of Decision was issued on the 29th of May 2008 (Ref: 12/12/20/857). This EMP serves to ensure that the recommendations contained within the RoD as well as the EIA (and specialist reports) will be implemented during the construction and operational phase of this project.

The scope of this document is to provide an environmental management plan, to the Contractor constructing the transmission power line, in fulfilment of ISO 14001 requirements. This document is part of the Contractors Employment contract and supplementary to Eskom's TRMSCAAC1 REV 3. The recommendations and constraints, as set out in this document, are enforceable under the general conditions of the contract.

The objective of this management plan is to ensure that:

- All anticipated environmental impacts during the construction periods are identified and mitigation measures are clearly outlined.
- All Environmental Management conditions and requirements are implemented throughout the project,
- All Landowner special conditions are identified and taken into consideration as the power line traverses private properties.
- Ensure that Eskom Transmission's Environmental Policy TRMPBAAX3 Rev 3 is underwritten at all times.
- Ensure that all environmental conditions as stipulated in the Record of Decision (ROD) are implemented.
- Ensure that problems and claims arising from damage are immediately resolved to ensure a smooth flow of operations.
- To preserve the natural environment by limiting destructive actions on site.
- To ensure that all relevant legislation (including national, provincial and local) is complied with during the construction and operation phases

- To ensure that the completion date of the contract is not delayed due to problems with Landowners arising during the course of construction.

1.1 Background information

1.1.1 Project Execution area

The execution area is limited to the area as demarcated by Eskom and shown on the locality plan (Appendix A) and servitude route photographs (Appendix B). The transmission power line will be constructed between the Tabor and Witkop substations, starting at the Tabor substation, situated towards the north of the Tropic of Capricorn in Limpopo, and travelling south to the Witkop substation which is situated towards the south of Polokwane town in the Limpopo Province (approximately 110km long). Representative photographs of the route topography are included in Appendix B.

No area of major concern was identified during the power line walk down however protected Marula trees (*Sclerocarya birrea*) were encountered in various sections of the proposed power line route. A specialist survey was conducted in September 2010 in order to assess the ecological and heritage features of the power line and pylon positions and to identify sensitivities. No Red Data or threatened species were identified during the survey however lists of Red Data and threatened species are included in the specialist reports (refer to Appendix F) to be used by the ECO during monitoring activities.

Any area outside the Eskom servitude area, required to facilitate access, construction activities, construction camps or material storage areas, shall be negotiated with the affected Landowner and written agreements shall be obtained. All construction areas shall be cleared in accordance with the Eskom Standard for Bush clearing ESKASABG3. Any extra space to be cleared outside the servitude shall be negotiated with the relevant Landowner and approved by Eskom. All areas marked as no go areas inside the servitude shall be treated with the utmost care and responsibility.

Should water be required from sources other than Eskom supply, a written agreement shall be reached between the Contractor and the Landowner. Should the Contractor be required to use water from a natural source, the Contractor shall supply a method statement to that effect and obtain the required permits. Strict

control shall be maintained and the ECO shall regularly inspect the abstraction point and methods used.

1.1.2 Technical Specification

1.1.2.1. Length:

The total length of the proposed Tabor to Witkop power line will be approximately 110 km.

1.1.2.2. Construction Area:

The servitude width is 55m. Construction is limited to the width of the servitude in which the power line will be constructed.

1.1.2.3. Tower parameters:

- Tower spacing: 200 – 600 m
- Tower height: 30 - 45 m
- Conductor attachment height: Will depend on the tower type
- Conductor type: 4 X Kingbird
- Minimum ground clearance: 8.1 m.

1.1.2.4. Tower Design:

The following types of towers may be used on this project:

- Cross rope suspension tower.
- Guyed-V suspension tower.
- Self-supporting suspension tower.

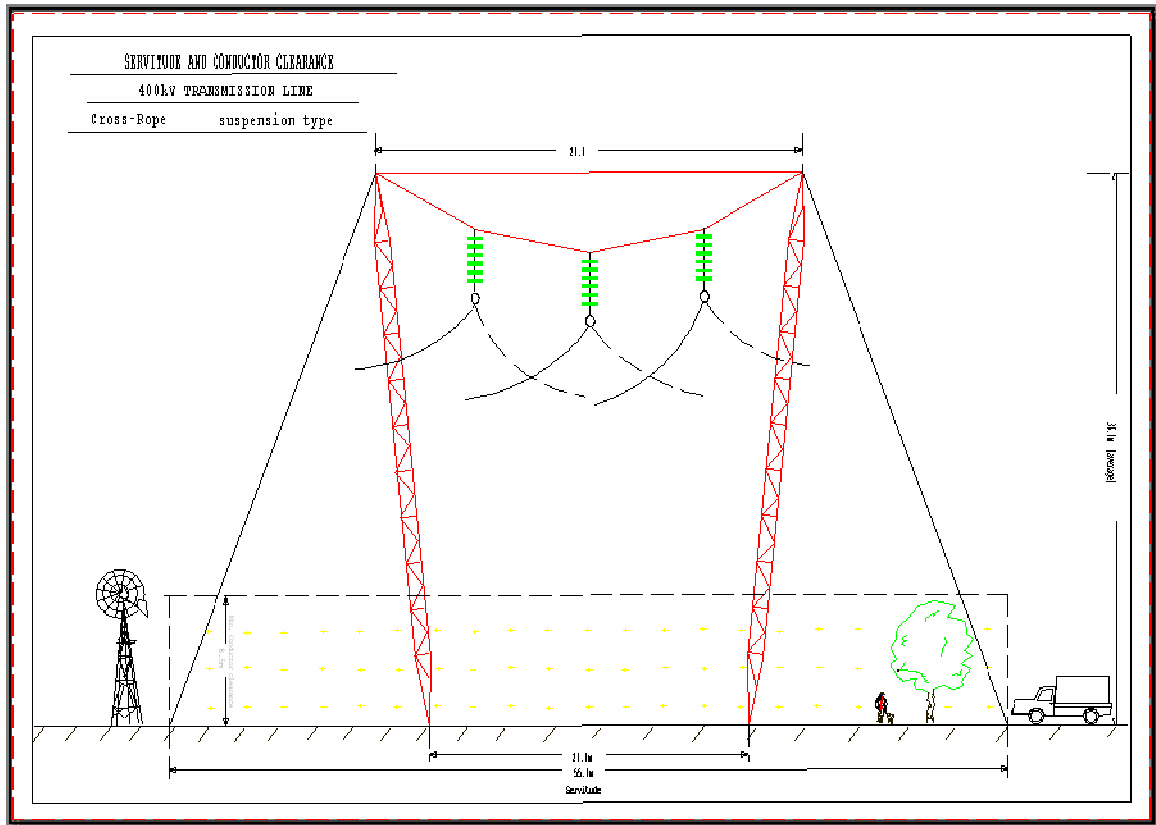


Figure 1: View of the Cross rope suspension tower.

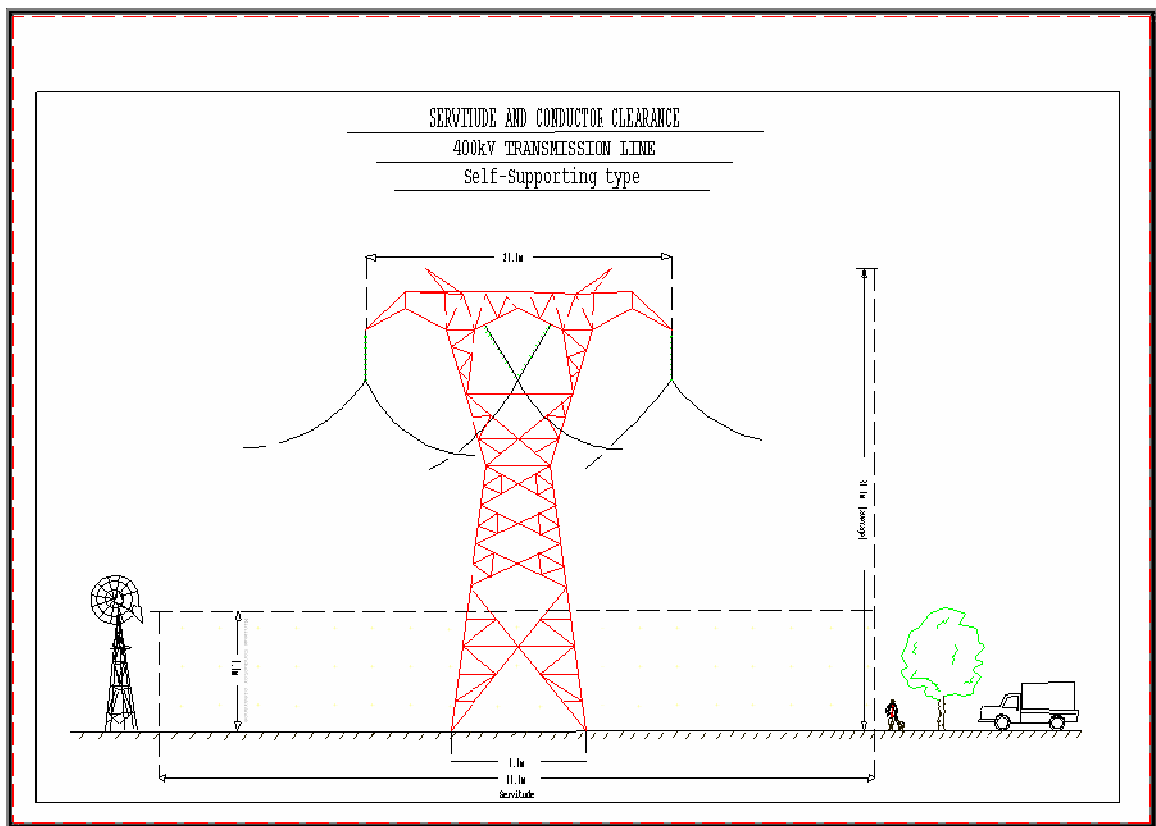


Figure 2: View of the Self supporting type tower

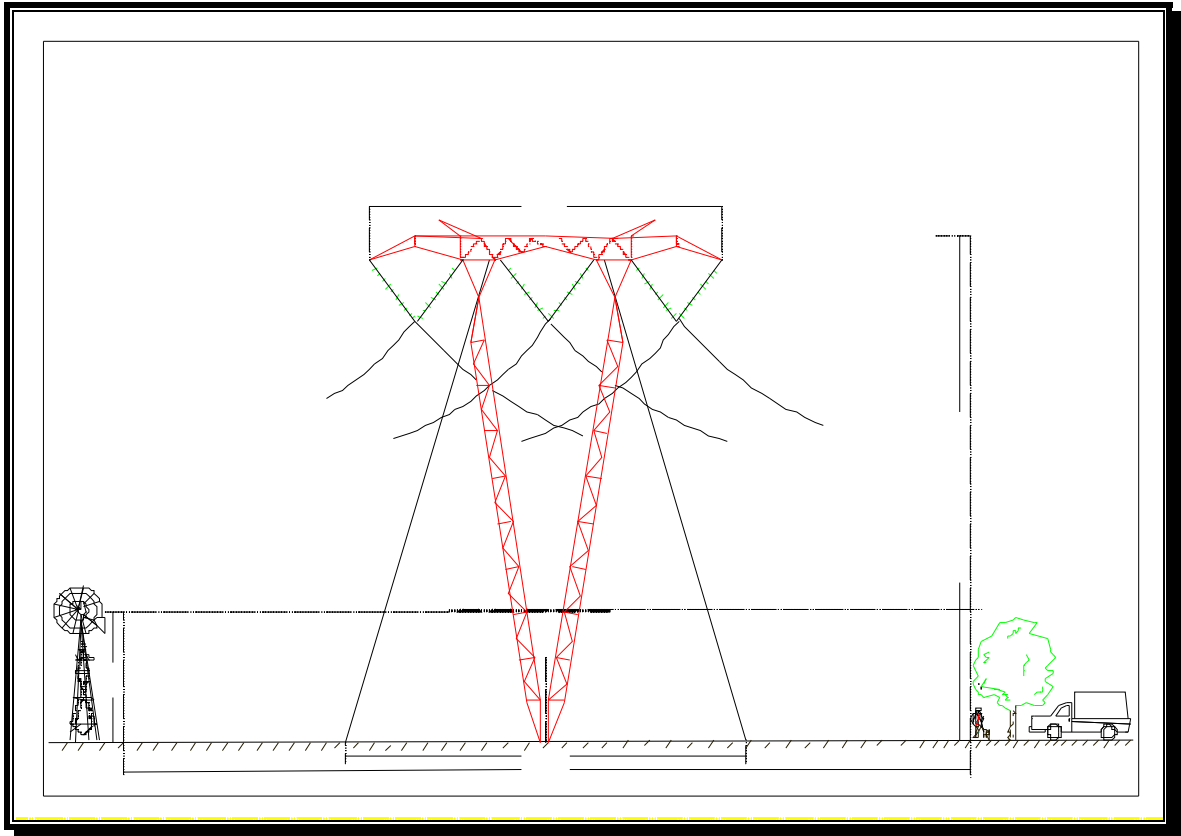


Figure 3: View of the Guyed-V suspension tower

The final tower types chosen will depend on both the technical and environmental constraints as well as landowner requirements. Where necessary a different tower type could be used if it enables Eskom to address a site-specific constraint or issue.

The contractor must ensure that the correct equipments for construction purposes are available at all times to ensure construction activities took place with no unnecessary damages to the environment.

1.1.2.5. Major Activities of the project

(Note: This section to be completed on appointment of the relevant contractors)

The project involves 21 major activities. These are outlined in the table below (to be provided by the project manager):

ACTIVITIES	STATUS
Environmental Impact Assessment – Copy of the Authorisation is appended to this document (Appendix E).	Completed
Negotiations for the servitude – Landowners, their contact details and their special conditions are listed under Section 7 of this document.	Completed
Land survey to determine the exact routing of the power line and tower placement.	Completed
Pegging of bend tower by a Transmission surveyor.	Completed
Profiling work to produce the profiles for construction (refer to Appendix “C”).	Completed
Establishment of camp sites for the Contractors’ workforce.	
Negotiations with landowners for access roads to the servitude.	
Servitude gate installation to facilitate access to the servitude.	
Vegetation clearing to facilitate access, construction and the safe operation of the power line.	
Establishing of access roads on the servitude where required as per design parameters in TRMSCAAC1 rev 3.	
Pegging of tower positions for construction by the contractor.	
Transportation of equipment, materials and personnel to site and stores.	
Excavation and casting of concrete for foundations for the towers.	
Tower assembly and erection.	
Conductor stringing and regulation.	
Taking over the power line from the contractor for commissioning.	
Final inspection of the power line, commissioning and hand over to the Grid and Servitude Manager for operation.	
Rehabilitation of disturbed areas.	
Signing off of all Landowners upon completion of the construction and rehabilitation	
Handing over and taking over of the servitude by the Grid Environmental Manager.	
Operation and maintenance of the power line by the Grid.	

The final inspection for the release of the Contractors' guarantee takes place a year after completion of the project. The power line will be in operation immediately after completion of the project and will stay operational for the lifetime of the plant.

2. ACRONYMS

Name of Act / Eskom Specification/ Procedure	Abbreviation
Access to Farms	TRMPVACV2 REV1
Agricultural Pests Act of 1983 (Act No. 36 of 1983)	APA
Air Quality Act of 2004 (Act No 39 of 2004)	NAQA
Animals Protection Act of 1962 (Act No. 71 of 1962)	APA
Atmospheric Pollution Prevention Act of 1965 (Act No. 45 of 1965)	APPA
Biodiversity Act of 2004 (Act No. 10 of 2004)	BDA
Bush Clearing	ESKASABG3
Conservation of Agricultural Resources Act of 1993 (Act No. 43 of 1983)	CARA
Contractor Environmental Control Officer	CECO
Department of Environmental Affairs	DEA
Department of Water Affairs	DWA
Environment Conservation Act of 1989 (Act NO. 73 of 1989)	ECA
Environmental Control Officer	ECO
Environmental Management Plan	EMP
Eskom Manual on Storage and Handling of Flammable and combustible liquids	ESKAMAAD1
Fencing Act of 1963 (Act No. 31 of 1963)	FA
Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947)	FFFAS
Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act of 1947 (Act No. 36 of 1947)	FFASA
Game Theft Act of 1991 (Act No. 105 of 1991)	GTA
Hazardous Substances Act of 1973 (Act No. 15 of 1973)	HSA
Labour Relations Act of 1995 (Act No.66 of 1995)	LRA
Mineral and Petroleum Resources Development Act of 2002 (Act No. 28 of 2002)	MPRDA
Mountain Catchment Areas Act of 1970 (Act No. 63 of 1970)	MCAA
National Environmental Management Act of 1998 (Act No. 107 of 1998)	NEMA
National Forests Act of 1998 (Act No. 84 of 1998)	NFA
National Veld and Forest Fire Act 1998 (Act No. 101 of 1998)	NVFFA
National Water Act of 1998 (Act No. 36 of 1998)	NWA
Natural Heritage Resources Act of 1999 (Act No. 25 of 1999)	NHRA
Eskom Nesting Guideline	TRMAGAAZ3
Occupational Health and Safety Act of 1993 (Act No. 85 of 1993)	OHSA
Protected Areas Act of 2003 (Act No. 57 of 2003)	PAA

Name of Act / Eskom Specification/ Procedure	Abbreviation
Protected Areas Amendment Act of 2004 (Act 31 of 2004)	PAAA
Record of Decision	ROD
Skills Development Act of 1998 (Act No. 97 of 1998)	SDA
Transmission Power line Towers and Power line Construction	TRMSCAAC1 REV3
Water Services Act of 1997 (Act 108 of 1997)	WSA
World Heritage Convention Act of 1999 (Act No. 49 of 1999)	WHCA

3. PROJECT TEAM

Profession/Role	Name	Contact Details	Remarks
Eskom Environmental Advisor	Vuledzani Thanyani	011 800 5601	
EIA Consultants	Environmental Impact Management Services (Pty) Ltd	Tel: (011) 789-7170 Fax: (011) 787-3059	
Servitude Negotiator	Pieter Steenkamp	(011) 800 5818 (011) 800 3917	
Project Manager (PM)	Silinda Mhlanga	(011) 800 6613	
Site Manager	Not yet appointed		
ECO	To be appointed once Contractor has been appointed		
Contractor	Not yet appointed		
CECO (Dedicated person appointed by the contractor)	Not yet appointed		
Grids Environmental Practitioner	Tshianeo Maphangula	(011) 871 3406 086 667 9629	
Grid Line & Servitude Manager	Richard Chinzvende	(015) 299 0388	
Authorising Department	DEA		

3.1 Roles and Responsibilities of the Project Team

3.1.1 Project Manager/ Site Manager

- Represents and act on behalf of Eskom Transmission regarding the administration of contracts.
- In consultation with the system Planning Engineer, determines the scope of work.
- To provide scheduling, aspects of co-ordination and estimating
- Ensure implementation of the project plan within cost, time and quality constraints
- Ensure that implementation of EMP is executed as planned.
- Keep the asset owner informed of progress made during the life cycle of the project.

No work shall commence until permission is granted from the Environmental Advisor from Transmission Services and the ROD from DEA (formerly known as DEAT) has been obtained. The Project Manager shall ensure that all conditions in the ROD are fulfilled before the Contractor occupies the site. The Grid shall be kept informed of all developments on construction at all times. All the requirements from the Grid must be considered during the construction phase to ensure smooth transition.

3.1.2 Environmental Control Officer

- The Environmental Control Officer shall convey the contents of this document, the conditions of the Record of Decision from DEAT as well as the Landowner Special conditions to the Contractor site staff and discuss the contents in detail with Eskom Project Manager and Contractor at a pre-construction meeting. This formal induction training shall be done with all main and sub-contractors. Record of the training date, meeting attendees and discussion points shall be kept by the ECO.
- The Environmental Control Officer shall make contact with the local Extension Officer of the Limpopo Department of Economic Development, Environment and Tourism and the Interested and Affected Parties, as these contacts have valuable information about the area and the local farming community.
- Landowners shall therefore be informed timeously of the construction programme, duration and all interference with their daily activities. It is ECO's responsibility to inform Landowners of construction schedule.

- The contact numbers of the ECO and CECO shall be made available to Landowners.
- ECO will report progress made on a monthly basis to the EEA and Land & Rights EIA Manager. These reports shall be available at all times, on site or in project file and on request by auditors, DEAT and other I&APs.
- ECO shall record all Non Conformances and action plans to ensure that measures are put in place to remedy possible effect.
- The Environmental Control Officer shall be available on site all the time.

3.1.3 Contractor

- To provide all necessary supervision during the execution of the project. He/ She should be available on site all the time.
- To appoint a competent CECO that will be responsible for among others, ensuring erosion control measures are installed, overseeing construction activities, giving toolbox talks, etc.
- To implement the projects as per the approved project plan.
- To ensure that implementation is conducted in an environmentally acceptable manner.
- To fulfil all obligations as per the agreed contract.
- To comply with special conditions as stipulated by Landowners during the negotiation process.
- The contractor, particularly the CECO is required to have onsite a copy of EMP at all times, be aware of its content and be charged with implementation of construction as per EMP conditions.
- To inform and educate all employees about the environmental risks associated with the different activities that should be avoided during the construction process and lessen significant impacts to the environment.

3.1.4 Eskom Environmental Advisor (During Operational Stage)

- To implement and integrate environmental management systems by ensuring compliance to the EMP and all other environmental legislation
- Ensures compliance to legislations and other legally binding documents

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
1. SITE ESTABLISHMENT								
<p>1.1 Set up living quarters, site office, assembly area and workshops</p>	<ul style="list-style-type: none"> Bush clearing and levelling, Install Concrete floor, Install Waste Collection Area, Cast concrete slabs for buildings & concrete bundled area for servicing vehicles Appointment of contractors labourers Hazardous storage area 	<ul style="list-style-type: none"> Damage to protected / endangered vegetation Damage to topsoil concrete Compacting of ground Employment and skills development Damage to river and wetland system through sedimentation and pollution Fragmentation of faunal populations Destruction of granite hills and associated ecological systems 	<p>NEMA BDA CARA LRA SDA OHSA</p>	<p>Objective:</p> <ul style="list-style-type: none"> Topsoil must be conserved and stockpiled for rehabilitation Minimise scarring of the soil surface and land features Minimise disturbance and loss of topsoil Rehabilitate all disturbed areas along the servitude Avoid wet areas Minimise damage to vegetation (protected species) Minimise possibility of erosion due to removal of vegetation Minimise removal of plant material on river and stream embankments Local labourers should be used wherever possible Improve local skills wherever possible To identify any no-go areas in terms of the existence of species of conservation importance Provide safe working environment. <p>Mechanisms:</p> <ul style="list-style-type: none"> Site establishment shall take place in an orderly manner and all amenities shall be installed at 	<ul style="list-style-type: none"> Written agreement between Land Owner and Contract regarding occupation of site. No visible erosion scars once construction is completed No claims regarding damage leading to litigation due to unauthorised removal of vegetation All damaged areas successfully rehabilitated one year after completion No damage to wet areas Only 8m vegetation cleared along the centre of the servitude for access purposes No vegetation interfering with structures and statutory safety requirements upon completion of the contract No de-stumping of vegetation on river and stream embankments All alien invaders and “densifiers” removed to limit the fire hazard No visible herbicide damage to the vegetation 	<p>Report on all NCRs identified</p> <p>Perform Spot Audits regularly</p> <p>Conduct final audit before site handover to the asset owner</p>		<p>ECO Contractor Eskom Environmental Practitioner / Advisor</p>

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<p>Camp sites before the main workforce move onto site.</p> <ul style="list-style-type: none"> • The Contractor camp shall have the necessary ablution facilities with chemical toilets where such facilities are not available at commencement of construction in accordance with OHSWA specifications. E.g. 1 toilet per 15 persons. • Provision of potable water for drinking • The Contractor shall supply a wastewater management system that will comply with legal requirements and be acceptable to Eskom. • Location of construction camp must be negotiated with the affected landowner prior to occupation. • Camp site must be fenced off and kept locked at all times • Security guards should be placed in all entrance to the contractors camps in order to prevent unauthorised access. • Compacted ground shall be rehabilitated by ripping to a minimum depth of 600mm • Strive to undertake majority of the construction during the dry season • Top soil stockpiles should not exceed two metres in height • Utilise existing roads and tracks 	<p>along the servitude one year after completion of the contract due to incorrect herbicide use</p>			

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<p>where possible</p> <ul style="list-style-type: none"> • Provide suitable living quarters where required as per OHSA specifications • A hazardous storage area, banded to 110% and subject to relevant HSE standards should be constructed • All necessary steps must be taken to avoid causing impacts on rivers and wetlands. If impacts cannot be avoided then a water use license must be obtained to permit an impact upon a water resource. • Prevent soil pollution through the construction of oil separator or sump for collecting contaminated runoff. 				

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
<p>1.2 Use of ablution facilities and kitchen facilities</p>	<ul style="list-style-type: none"> Install drainage system for toilets, waste water, water supply Avoid use of veld for toilet 	<ul style="list-style-type: none"> Ground water pollution and impact on vegetation Pollution of ground water and soil Health risk / spreading of diseases 	<p>NWA OHSA NEMA TRMSCAAC1 REV 3 OHSA</p>	<p>Objective:</p> <ul style="list-style-type: none"> To ensure proper sanitation is achieved and minimise the spread of diseases <p>Mechanisms:</p> <ul style="list-style-type: none"> The Contractor shall install mobile chemical toilets on site Staff shall be sensitised to the fact that they should use these toilets at all times No use of the veld shall be allowed, as this may create problems with the landowners and lead to claims for problems with stock diseases Toilet paper is a potential source of littering in the veld, and the Contractor shall be forced to clean up any litter The Contractor shall take all the necessary precautions against the spreading of disease, especially under livestock. 	<ul style="list-style-type: none"> No complaints received from landowners regarding sanitation No legal non-compliance with regard to pollution of water resources 	<p>A record of all complaints should be available on request. ECO officer to keep records</p>		<p>Contractor ECO CECO</p>

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
<p>1.3 Set up store area</p>	<ul style="list-style-type: none"> Install fencing & Digging holes, Insert Poles & concrete, Erect fence, grading and clearing the area Create fire breaks Storage of hazardous Substances 	<ul style="list-style-type: none"> Disturbance of topsoil Waste concrete Damage to protected / endangered vegetation Wire offcuts Fire risks Spillages 	<p>CARA NEMA ECA BDA HSA FA TRMSCAAC1 REV 3</p>		<ul style="list-style-type: none"> No incidents recorded No complaints from Landowners Certificate of treatment of soil Aspects and impacts register A register on all substances available on site All spills rehabilitated. 	<ul style="list-style-type: none"> The Environmental Control Officer shall approve gate positions. ECO to report NCRs Regular monitoring and recording of spills on the register 	<p>Monthly</p>	<p>ECO CECO</p>
<p>19</p>	<p>0821: TABOR – WITKOP TRANSMISSION LINE EMP ESKOM TRANSMISSION</p>							

Objectives:

- To prevent fire breakout
- To prevent soil pollution

Mechanisms:

- Fencing in of the storage areas

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
						Monitor register		
1.4 Set Up Batching plant	<ul style="list-style-type: none"> Dust and Noise Management during site establishment 	<ul style="list-style-type: none"> Dust nuisance from the excavated and stockpiled material 		<p>Objectives:</p> <ul style="list-style-type: none"> To avoid dust nuisance from excavated material To avoid noise nuisance from operating construction equipment To reduce atmospheric pollution from dust <p>Mechanism:</p> <ul style="list-style-type: none"> Implement dust suppression measures e.g. regular watering Concrete mixing to be carried out away from sensitive areas Develop and implement dust monitoring programme Limit working hours of noisy equipment to daylight hours Fit silencers to equipment where ever possible Batching plant to be situated in such a location as to minimise potential for pollution. Hard impervious surface subject to bund and environmental protection measures should be provided to prevent contaminated runoff. 	<ul style="list-style-type: none"> The working area shall be monitored for dust conditions and water spraying applied frequently if required. 	Daily visual monitoring by the Contractor	Daily	Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
1.5 Use of vehicles for material, equipment and personnel transportation	<ul style="list-style-type: none"> Trucks delivering material to store area Servicing vehicles resulting in draining oil and removing filters & Emergency repairs due to breakages Transport of personnel and material to site 	<ul style="list-style-type: none"> Oil, lubricants or fuel spills Waste material containers / packaging 	NWA ECA NEMA HSA OHSA	<p>Objectives:</p> <ul style="list-style-type: none"> To prevent and minimise pollution to the environment. Prevent transgressing acts that governs pollution <p>Mechanisms:</p> <ul style="list-style-type: none"> Where possible and practical all maintenance of vehicles and equipment shall take place in the workshop area. During servicing of vehicles or equipment, a suitable drip tray must be used to prevent spills onto the soil, especially where emergency repairs are effected outside the workshop area. Leaking equipment shall be repaired immediately or be removed from site to facilitate repair. All potentially hazardous and non-degradable waste shall be collected and removed to a registered waste site. A certificate of disposal shall be obtained by the Contractor and kept on file Workshop areas must at all times be monitored for oil and fuel spills and such spills must be cleaned and re-mediated to the satisfaction of the ECO. The Contractor shall be in possession of an emergency spill kit that must be complete 	<ul style="list-style-type: none"> No hazardous substance spills noted 	Monitor register	Daily	Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				and available at all times on site. <ul style="list-style-type: none"> All hazardous substances shall be stored in suitable containers and storage areas shall be banded. This includes all carbon substances like fuel and oil as well as herbicides and battery acid. As per OHSWA requirement all Material Safety Data Sheet (MSDS) should be available onsite for all hazardous substances stored onsite Any leaking containers must be repaired or removed from site (See above actions for spills). A register shall be kept on all substances and be available for inspection at all times. Areas shall be monitored for spills and any spills shall be recorded and rehabilitated immediately Make spill kits available for utilisation during accidental spills 				
1.6 Tower Pegging	Vehicle driving in veld	<ul style="list-style-type: none"> Damage to protected / endangered vegetation Damage to heritage sites Oil Spills 	BDA NHRA NWA CARA		<ul style="list-style-type: none"> No unnecessary disturbance to the surrounding areas Successful rehabilitation of disturbed areas following construction 	Regular monitoring of areas for unnecessary disturbance during construction ECO to monitor post-construction rehabilitation	Daily End of construction phase (post)	ECO Contractor CECO Ecologist/Botanist (if available) Archaeologist (if available)

Objective:
To minimise environmental impact

Mechanisms:

- Re-seeding shall be done on disturbed areas as directed by

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<p>and slopes in excess of 12% must be terraced. Other methods of rehabilitation of tower sites may also be used at the discretion of the ECO, e.g. stone pitching, logging, etc. Contour banks shall be spaced according to the slope on tower sites. The type of soil shall also be taken into consideration.</p> <ul style="list-style-type: none"> A permit should be obtained in order to impact on protected trees e.g. <i>sclerocarrya birrea</i> 			rehabilitation)	
	Surveyor pegging towers	Littering of packaging & pegging materials	NEMA ECA	Please refer to littering under site establishment.	<ul style="list-style-type: none"> No packaging and pegging materials unnecessarily strewn into surrounding areas 	Monitor at each pylon position	Ongoing monitoring	ECO CECO Contractor

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
1.7 Bush clearing	<ul style="list-style-type: none"> • People cutting vegetation by hand • Bulldozer clearing vegetation 	<ul style="list-style-type: none"> • Damage to protected / endangered vegetation • Disturbance of topsoil • Damage to heritage sites • Fragmentation of faunal populations • Displacement of faunal species and subsequent loss of faunal habitats 	BDA NHRA OHSA CARA	<p>Objectives:</p> <ul style="list-style-type: none"> • Minimise damage to vegetation • Keep servitude as natural looking as possible • Minimise interference by vegetation to flow of electricity • Minimise possibility of erosion due to removal of vegetation • Minimise removal of plant material on river and stream embankments • Eradication of alien invader and densifier species that cause a fire hazard • To identify any no-go areas in terms of existence of species of conservation importance. • To maintain ecological functionality of the wider region as well as hydrological system. <p>Mechanisms:</p> <ul style="list-style-type: none"> • Protected species (e.g. <i>Sclerocarya birrea</i>) of plants shall not be removed unless they are interfering with the power line. • Where such species have to be removed due to interference with the power line, the necessary permission and permits shall be obtained from Provincial Nature Conservation. • All protected species not to be removed must be clearly marked and such areas fenced off. 	<ul style="list-style-type: none"> • Only 8m vegetation cleared along the centre of the servitude for access purposes • No vegetation interfering with structures and statutory safety requirements upon completion of the contract • No de-stumping of vegetation on river and stream embankments • All alien invaders and densifiers removed to limit fire hazard • As required by CARA spread of invasive species should be prevented • No visible herbicide damage to the vegetation along the servitude one year after completion of the contract due to incorrect herbicide use • No litigation due to unauthorised removal of vegetation 	Ongoing monitoring for the duration of the construction period	Daily Monthly	Contractor CECO ECO
24	0821: TABOR – WITKOP TRANSMISSION LINE EMP			<p>Utilise existing tracks and roads where possible.</p> <ul style="list-style-type: none"> • During vegetation clearing avoid killing and/or hunting of animals. • All necessary steps must be taken to avoid causing impacts on rivers and wetlands. If 	ESKOM TRANSMISSION			

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
	<ul style="list-style-type: none"> Clearing of vegetation on river banks Excessive clearing of servitude 	<ul style="list-style-type: none"> Erosion and invader plants Damage to protected / endangered vegetation 	CARA BDA NWA	<p>Objectives:</p> <ul style="list-style-type: none"> Minimise erosion damage on donga crossings Minimise impeding the natural flow of water Minimise initiation of erosion through donga embankments Minimise damage to river and stream embankments Minimise erosion of embankments and subsequent siltation of rivers, streams and dams <p>Mechanisms:</p> <ul style="list-style-type: none"> No vegetation clearing shall be allowed across ravines and gullies, as this vegetation will very rarely interfere with the clearance to the strung conductor Protected species (e.g. <i>Sclerocarya birrea</i>) of plants shall not be removed unless they are interfering with the power line. Where such species have to be removed due to interference with the power line, the necessary permission and permits shall be obtained from Provincial Nature Conservation. Erosion control measures where erosion is anticipated e.g. donga crossings. 	<ul style="list-style-type: none"> No interference to donga embankment No erosion visible to donga embankment due to construction activities No interference with natural flow of water No disturbance to donga embankments Licence requirement to be met where applicable. 			

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
1.8 Gate installation	<ul style="list-style-type: none"> Flattening of fences to gain access Tying off fence and straining fence wires 	<ul style="list-style-type: none"> Damage to fences Damage to electrical fencing Wire off cuts and broken fences Translocation of livestock into adjacent farms due to broken fences 	FA TRMPVACV2 REV1 TRMSCAAC1 REV 3	<p>Objectives:</p> <ul style="list-style-type: none"> To install gates to allow access for construction Minimise damage to existing fences and gates To limit access to Eskom & contractor employees by using keys All fences properly tied off to the gate posts All fences properly and neatly installed according to specifications <p>Mechanisms:</p> <ul style="list-style-type: none"> The Landowners shall be kept abreast of all developments and shall be kept informed about the progress and phases of the contract. All gates shall be fitted with locks and be kept locked at all times during the construction phase. Gates shall only be left open on request of the Landowner if he accepts partial responsibility for such gates in writing, once the Contractor have left site and the gates are fitted with Eskom locks. Such gates shall be clearly marked. All claims arising from gates left open shall be investigated and settled in full by the Contractor. 	<ul style="list-style-type: none"> No transgression of the fence act and therefore no litigation No damage to the fence and no complaints from land owner All gates to be kept locked at all times to limit access to keyholders No complaints and claims due to unclosed gates 	Onsite monitoring at each fence crossing point (during gate erection)	When required	Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<ul style="list-style-type: none"> If any fencing interferes with the construction process, such fencing shall be deviated / protected until construction is completed. Game gates, drawing 0.00/10280 Rev 0, shall be installed where necessary. All gates installed in electrified fencing shall be re-electrified. The Environmental Control Officer shall approve gate positions. All gate positions shall be three (3) metres off centre to allow for continued access when stringing takes place. 				
	Dig holes	Disturbance of topsoil	CARA					

Objective:

To limit disturbance to the receiving environment during excavations

Mechanisms:

- At any gate poles where conventional foundations are

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<ul style="list-style-type: none"> Ensure soil is replaced as per original position of soil strata 				
	<ul style="list-style-type: none"> Insert gate and pour concrete Installation of concrete sill in Vermin proof fence 	<ul style="list-style-type: none"> Waste concrete 	NEMA ECA	<p>Objective:</p> <ul style="list-style-type: none"> To minimise the dispersal of waste during gate installations <p>Mechanisms:</p> <ul style="list-style-type: none"> No waste material shall be left on site that may harm man or animals. Surplus concrete may not be dumped indiscriminately on site, but shall be disposed of in designated areas as agreed by the Landowner. Concrete trucks shall not be washed on site after depositing concrete into foundations. Any spilled concrete shall be cleaned up immediately Concrete not to be mixed on the soil surface Impervious liner material should be used for mixing of concrete. 				
2. ACCESS ROADS CONSTRUCTION								
1.8 Use of access roads	<ul style="list-style-type: none"> Mark access roads Vehicles 	<ul style="list-style-type: none"> Damage to protected / endangered vegetation 		<p>Objectives:</p> <ul style="list-style-type: none"> Minimise damage to river and stream embankments Minimise erosion of 	<ul style="list-style-type: none"> Access plan approved by ECO All access roads will be marked 	<ul style="list-style-type: none"> Regular monitoring of access roads 	Ongoing for the duration of the construction period	Contractor CECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
	<ul style="list-style-type: none"> driving off servitude road Illegal use of private roads 	<ul style="list-style-type: none"> Damage to drifts and bridges & irrigation power lines Fragmentation of faunal populations Displacement of faunal species and the subsequent loss of faunal habitats Trespassing on private property if not using approved routes and roads 		<p>embankments and subsequent siltation of rivers, streams and dams</p> <ul style="list-style-type: none"> To maintain ecological functionality of the wider region as well as hydrological systems. To minimise nuisance to landowners due to construction vehicle movement or potential trespassing <p>Mechanisms:</p> <ul style="list-style-type: none"> A physical access plan along the servitude shall be compiled and the Contractor shall adhere to this plan at all times. Proper planning when the physical access plan is drawn up by the ECO in conjunction with the Contractor shall be necessary to ensure access to all tower sites. Suitable access to the individual pylon positions must be established in a way that results in the least damage to the habitat between existing roads and the pylon sites. Where possible, access roads should be constructed as per the locations and recommendations of the Heritage and Ecological specialist reports (Appendix F). All access roads will be marked Agreed on Access to be used at all times. 	<ul style="list-style-type: none"> No complaints from residents and landowners No access roads through river and stream banks No visible erosion scars on embankments once construction is completed 	<p>conditions</p> <ul style="list-style-type: none"> Monitoring of impacts into the surrounding areas 		<p>ECO Landowner</p>

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<ul style="list-style-type: none"> • No illegal use of private roads during construction due to damage anticipated as a result of heavy vehicles and equipment • All existing private access roads used for construction purposes, shall be maintained at all times to ensure that the local people have free access to and from their properties. • Speed limits shall be enforced in such areas and all drivers shall be sensitised to this effect. • Upon completion of the project all roads shall be repaired to their original state. • No roads shall be cut through river- and stream banks as this may lead to erosion causing siltation of streams and downstream dams. • Existing drifts and bridges may be used if the Landowner gives his consent. Such structures shall then be thoroughly examined for strength and durability before they are used. New drifts and bridges shall only be constructed with the approval of Eskom and the Landowner and at the discretion of the Environmental Control Officer. • All structures constructed for access purposes shall be properly designed and drawings 				

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<p>of such structures shall be available for record purposes.</p> <ul style="list-style-type: none"> • Risk analysis by contractor should be presented to Eskom/PM where any safety risk may be anticipated • No vehicular traffic shall be allowed in wet areas. Only existing roads through such areas may be used with the approval of Eskom and the Landowner. • No equipment shall be used which may cause irreparable damage to wet areas. The contractor shall use alternative methods of construction in such areas. • An archaeologist should be present when access roads to tower/pylon positions T137, 164 165 and 199 are planned. • Utilise existing roads and tracks where possible • Protected species (e.g. <i>Sclerocarya birrea</i>) of plants shall not be removed unless they are interfering with the power line. • Where such species have to be removed due to interference with the power line, the necessary permission and permits shall be obtained from Provincial Nature Conservation. • All necessary steps must be 				

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				taken to avoid causing impacts on rivers and wetlands. If impacts cannot be avoided then a water use license must be obtained to permit an impact upon a water resource.				
	Bulldozer blading access roads	<ul style="list-style-type: none"> • Damage to protected / endangered vegetation • Damage to heritage sites • Damage to private roads 	BDA NHRA	<p>Objectives:</p> <ul style="list-style-type: none"> • Construct access roads with minimal blading of road surfaces • To prevent and/ or mitigate the negative impacts on heritage and cultural resources. <p>Mechanisms:</p> <ul style="list-style-type: none"> • No scalping shall be allowed on any part of the servitude road unless absolutely necessary. • The removal of all economically valuable trees or vegetation shall be negotiated with the Landowner before such vegetation is removed. • All trees and vegetation cleared from the site shall be cut into manageable lengths and neatly stacked at regular intervals along the power line. • No vegetation shall be pushed into heaps or left lying all over the servitude. • Protected or endangered species of plants shall not be removed unless they are interfering with the power line. • Where such species have to be removed due to interference 	<ul style="list-style-type: none"> • Minimise balding/scalping of servitude and access roads as far as possible • Rehabilitation of excessive clearing of vegetation • Removal and disposal of vegetation that has been cleared 	Ongoing monitoring of all balding/scalping of areas	Ongoing	Contractor CECO ECO Landowner

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<p>with the power line, the necessary permission and permits shall be obtained from Provincial Nature Conservation</p> <ul style="list-style-type: none"> Avoid outcrops, bare patches of vegetation and watercourses as these may be associated with heritage and cultural resources. 				
	Blading of access roads through dongas	<ul style="list-style-type: none"> Causing erodable areas, Erosion and loss of topsoil 	CARA	<p>Objectives:</p> <ul style="list-style-type: none"> To limit erodable surfaces during access road construction <p>Mechanisms:</p> <ul style="list-style-type: none"> Vegetation clearing must be kept to a minimum. Big 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 shall be removed or flattened and not be pushed to form an embankment. Top soil stockpiles should not exceed two metres in height Protected species (e.g. <i>Sclerocarya birrea</i>) of plants 	<ul style="list-style-type: none"> Only 8m vegetation cleared along the centre of the servitude for access purposes No vegetation interfering with structures and statutory safety requirements upon completion of the contract No de-stumping of vegetation on river and stream embankments All alien invaders and densifiers removed to limit the fire hazard No visible herbicide damage to the vegetation along the servitude one year after completion of the contract due to incorrect herbicide use No litigation due to unauthorised removal of vegetation 	All areas containing dongas or erosion concerns to be monitored daily	Daily	Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				shall not be removed unless they are interfering with the power line. <ul style="list-style-type: none"> Where such species have to be removed due to interference with the power line, the necessary permission and permits shall be obtained from Provincial Nature Conservation. 				
	Construction of drifts / donga crossings	<ul style="list-style-type: none"> Erosion / impedance of water flow 	NWA	Objectives: <ul style="list-style-type: none"> Areas that require the construction of drifts / donga crossings must be suitably inspected with planning of construction carefully scrutinised to ensure free flow of water and to limit erosion concerns To minimise soil erosion, which will affect associated drainage regimes Strive to undertake majority of construction work during dry season 	<ul style="list-style-type: none"> Drifts / donga crossings show sufficient stability for duration of their use No erosion noted at drifts / donga crossings 	Casual monitoring must take place each time a crossing is used Close inspection must regularly be undertaken	Daily (casual) Weekly (close inspection)	Contractor CECO ECO
	Road construction on slopes	<ul style="list-style-type: none"> Erosion and loss of topsoil 	CARA	Objectives: <ul style="list-style-type: none"> Construction of roads and implementation of mitigation measures to be closely monitored by the Contractor and ECO. Soil stabilisation measures to be implemented on steep slopes. Rehabilitation of disturbed areas immediately following road construction. 	<ul style="list-style-type: none"> Road stabilisation is evident for the duration of the use thereof. Erosion is not evident on slopes. 	Casual monitoring must take place each time a slope road is used Close inspection must regularly be undertaken	Daily (casual) Weekly (close inspection)	Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
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3. TOWER CONSTRUCTION

Excavation of foundation	<ul style="list-style-type: none"> Disturbance of topsoil and vegetation Loss of topsoil with seed bank 	CARA TRMSCAAC1 REV 3	<p>Objectives:</p> <ul style="list-style-type: none"> Confine disturbance to area of foundation and work area only. No unnecessary disturbances allowed. To minimise soil erosions, which will affect associated drainage regimes <p>Mechanisms:</p> <ul style="list-style-type: none"> Disturbance of topsoil on tower sites with severe slopes shall be minimised at all costs. At any tower sites where conventional foundations are installed, the Contractor shall remove the topsoil separately and store it for later use during rehabilitation of such tower sites. During backfilling operations, the Contractor shall take care not to dump the topsoil in the bottom of the foundation and then put spoil on top of that The contractor shall avoid translocating topsoil stockpiles from one place to another or importing topsoil from other sources that may contain alien plant propagules Re-seeding shall be done on disturbed areas as directed by 	<ul style="list-style-type: none"> Revegetation of disturbed areas proceeds well with numerous species from original seed bank sprouting. No erosion noted during and after construction. 	Regular monitoring at each tower site.	Ongoing for the duration of the construction of the foundations	Contractor CECO ECO
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4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				the Environmental Control Officer. <ul style="list-style-type: none"> Slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced. Other methods of rehabilitation of tower sites may also be used at the discretion of the Environmental Control Officer, e.g. stone pitching, logging, etc. Contour banks shall be spaced according to the slope on tower sites. The type of soil shall also be taken into consideration. Alien plant species must be controlled along service roads and construction sites. Construction activities must not interfere with the protected tree (<i>sclerocarya birrea</i>) growing along the power line route unless a necessary permit has been obtained to do so. Strive to undertake majority of construction work during dry season 				
		<ul style="list-style-type: none"> Damage to heritage sites 	NHRA	Objectives: <ul style="list-style-type: none"> To limit damage to heritage sites during construction To prevent and/ or mitigate the negative impacts on heritage and cultural resources Mechanisms: <ul style="list-style-type: none"> During excavation of tower positions, a visual check for any 	<ul style="list-style-type: none"> Any finds are immediately reported to a suitably qualified archaeologist for further investigation. 	<ul style="list-style-type: none"> Visual checks by construction crew and contractor during excavations 	Ongoing during all excavations	Contractor CECO ECO Qualified archaeologist

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				heritage/archaeological sites or artefacts must be constantly implemented. In the event that structures or artefacts are found, work must cease immediately and the guidance of a suitably qualified archaeologist sought. <ul style="list-style-type: none"> At pylon positions T77, T112, T137, T164, T165, T199 and T204 the excavated holes must be inspected by an archaeologist for Historic and Early Iron Age settlements. Avoid outcrops, bare patches of vegetation and watercourses as these may be associated with heritage and cultural resources. 				
	<ul style="list-style-type: none"> Drilling of foundation 	Noise and dust pollution	NEMA ECA	Objectives: <ul style="list-style-type: none"> To avoid dust nuisance from excavated material To avoid noise nuisance from operating construction equipment To minimise pollution, that can affect associated hydrological resources. Mechanism: <ul style="list-style-type: none"> Implement dust suppression measures e.g. regular watering Develop and implement dust monitoring programme Limit working hours of noisy equipment to daylight hours Fit silencers to equipments 	<ul style="list-style-type: none"> No complaints from surrounding land owners recorded. 	<ul style="list-style-type: none"> A register of complaints to be kept on site at all times and kept up to date. 	Ongoing	Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<ul style="list-style-type: none"> Ensure that all vehicles and equipment are in good working order at all times. Strive to undertake majority of construction during dry season 				
	<ul style="list-style-type: none"> Installation of steel reinforcing 	Waste material	NEMA ECA	<p>Objectives:</p> <ul style="list-style-type: none"> Minimise waste material being strewn in the environment <p>Mechanisms:</p> <ul style="list-style-type: none"> No waste material shall be left on site. Any broken insulators shall be removed and all shards picked up. Broken, damaged and unused nuts, bolts and washers shall be picked up and removed from site. 	<ul style="list-style-type: none"> Post-construction work areas are clear of all waste materials. 	<ul style="list-style-type: none"> Post-construction cleanup operations to be undertaken for each area impacted upon. 	Post construction (in each area)	Contractor CECO ECO
	<ul style="list-style-type: none"> Casting of concrete & washing of concrete truck on site 	<ul style="list-style-type: none"> Waste concrete 	NEMA ECA	<p>Objectives:</p> <ul style="list-style-type: none"> To minimise waste concrete from polluting the environment <p>Mechanisms:</p> <ul style="list-style-type: none"> Surplus concrete may not be dumped indiscriminately on site, but shall be disposed of in designated areas as agreed by the Landowner. Concrete trucks shall not be washed on site after depositing concrete into foundations. Any spilled concrete shall be cleaned up immediately 	<ul style="list-style-type: none"> Areas of construction are clear of all concrete residue/waste following construction. 	<ul style="list-style-type: none"> Post-construction cleanup operations to be undertaken for each area impacted upon. 	Ongoing during the use of concrete	Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<ul style="list-style-type: none"> Surplus concrete may not be dumped indiscriminately on site, but shall be disposed of in designated areas as agreed by the Landowner 				
	<ul style="list-style-type: none"> Assembling of towers Dressing of towers with hardware and insulators 	<ul style="list-style-type: none"> Waste bolts and nuts Insulator breakage littering glass shards in veld 	NEMA ECA	<p>Objectives:</p> <ul style="list-style-type: none"> Keep area clean of waste material at all times <p>Mechanisms:</p> <ul style="list-style-type: none"> No waste material shall be left on site that may harm man or animals. Any broken insulators shall be removed and all shards picked up. Broken, damaged and unused nuts, bolts and washers must be picked up and removed from site. 	<ul style="list-style-type: none"> Site is clear of all waste material post-construction. 	<ul style="list-style-type: none"> Contractor to inspect areas for waste following construction 	During construction Post-construction	Contractor CECO ECO
	<ul style="list-style-type: none"> Punching and painting of nuts 	<ul style="list-style-type: none"> Paint spillages 	NWA	<ul style="list-style-type: none"> Rehabilitation of soil 	<ul style="list-style-type: none"> Site is clear of paint spillages following painting 	<ul style="list-style-type: none"> Contractor to inspect areas for paint pollution 	Following painting	Contractor CECO ECO
	<ul style="list-style-type: none"> Erection of towers with crane 	<ul style="list-style-type: none"> Trucks / crane breaking and spilling oil / lubricants Fuel spillages during re- 	NWA	<p>Objectives:</p> <ul style="list-style-type: none"> To prevent spillages of hazardous substances <p>Mechanisms:</p> <ul style="list-style-type: none"> All vehicles must be in good working order to minimise breakdowns and leaks. Contaminated soil to be 	<ul style="list-style-type: none"> No evidence of hazardous substances polluting the site. 	<ul style="list-style-type: none"> Ongoing monitoring with regular inspections 	Ongoing with weekly inspections	Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
		fuelling		<p>removed from site and disposed of as hazardous waste.</p> <ul style="list-style-type: none"> Re-fuelling of vehicles to be undertaken at a designated re-fuelling site only. 				
	<ul style="list-style-type: none"> Erection of towers with helicopter 	<ul style="list-style-type: none"> Noise and dust pollution 	NEMA ECA	<p>Objectives:</p> <ul style="list-style-type: none"> To avoid dust nuisance from excavated material And avoid noise nuisance from operating construction equipment <p>Mechanism:</p> <ul style="list-style-type: none"> Implement dust suppression measures e.g. regular watering (especially during use of helicopter tower erection) Develop and implement dust monitoring programme Limit working hours of noisy equipment to daylight hours 	<ul style="list-style-type: none"> No complaints received from landowners 	<ul style="list-style-type: none"> Monitor during the use of helicopters 	When helicopters are used in the mountainous areas	Contractor CECO ECO Pilot
	<ul style="list-style-type: none"> Discarding packaging material on site 	<ul style="list-style-type: none"> Waste material littering in veld 	NEMA	<p>Objectives:</p> <ul style="list-style-type: none"> To avoid waste pollution from packaging material. <p>Mechanism:</p> <ul style="list-style-type: none"> A waste disposal management plan must be implemented and adhered to at all times. Littering should be strictly prohibited Waste bins must be located on site where waste is generated. All bins are to have lids or 	<ul style="list-style-type: none"> No waste evident in the environment. 	Regular monitoring by the contractor and ECO	Daily	Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				measures to ensure that waste does not fall out. <ul style="list-style-type: none"> All bins are to have suitable animal protection measures. All waste is to be removed from site regularly and disposed of at a suitable waste disposal site. Regular monitoring of waste on site is to be carried out. 				
4. STRINGING OPERATIONS								
	<ul style="list-style-type: none"> Installation of phase and earth conductors 	<ul style="list-style-type: none"> Damage to structures and agricultural crops 	TRMSCAAC1 REV 3	Objective: <ul style="list-style-type: none"> Prevent damage to expensive structures and crops, Prevent disruption of services Mechanisms: <ul style="list-style-type: none"> The necessary scaffolding / protection measures must be installed to prevent damage to structures supporting certain high yield agricultural crops, such as vineyards, orchards, nurseries, etc., as well as the crops itself All structures supplying services such as telephone and smaller power lines, as well as main and farm roads, shall be safeguarded by measures to prevent disruption of services Use of "rugby" posts to protect roads and telephone power lines are sufficient. 	<ul style="list-style-type: none"> No claims emanating from damage to supporting structures and crops No complaints or claims arising from disruption of services 	To be monitored at all times during installation of phase and earth conductors		Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
	<ul style="list-style-type: none"> Clearing of drum, tensioner and winch stations Creating fire breaks around drum stations 	Damage to protected / endangered vegetation	BDA	<p>Objectives:</p> <ul style="list-style-type: none"> Minimise damage to vegetation Minimise damage to topsoil Successful rehabilitation of barren areas <p>Mechanisms:</p> <ul style="list-style-type: none"> The siting of winch and tensioner stations shall be done in conjunction with the landowner and ecologist/ botanist and archaeologist that participated in the compilation of the EMP where necessary. Specifications require the protection of Eskom supplied material on site, especially conductor drums. This normally means that a firebreak is bladed around a drum station in the veld. These areas are left to rehabilitate on their own which could be disastrous. Once the stringing of conductor has been completed in a certain area, the winch- and tensioner stations shall be rehabilitated where necessary. If the area was badly damaged, re-seeding shall be done and fencing in of the area shall be considered and carried out. Where possible, trees along the alignment should not be damaged. This includes all areas, including sites of low 	<ul style="list-style-type: none"> No damage to vegetation outside the servitude No visible erosion three months after completion of the contract No loss of topsoil 			Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				sensitivity.				
	Using bulldozer for tension purposes	Damage to heritage sites, Disturbance of topsoil and vegetation	NHRA BDA CARA	<p>Objectives:</p> <ul style="list-style-type: none"> • Protection of archaeological sites and land considered to be of cultural value • Protection of known sites against vandalism, destruction and theft • The preservation and appropriate management of new archaeological finds should these be discovered during construction • Protection of sites and land considered to be of cultural value • Protection of known sites against vandalism, destruction and theft • The preservation and appropriate management of new finds should these be discovered during construction <p>Mechanisms:</p> <ul style="list-style-type: none"> • The position of known sites will be shown on the final profiles. Such areas shall be marked as no go areas. • Artefacts shall not be removed under any circumstances. • Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. 	<ul style="list-style-type: none"> • No destruction of or damage to known archaeological sites • Management of existing sites and new discoveries in accordance with the recommendations of the Archaeologists • No litigation due to destruction of sites 			Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<ul style="list-style-type: none"> Permits shall be obtained from the South African Heritage Resources Association (SAHRA) should the proposed power line affect any world heritage sites or if any sites are to be destroyed or altered. No dolomite, breccia or stromatolites may be removed or disturbed without the required permits from SAHRA. All monuments, heritage sites and historical sites shall be treated with the utmost respect. Any graves shall be clearly marked and treated as no go areas. No destruction of any site shall be allowed. Should it be necessary to remove any graves, the necessary procedures shall be followed and permits obtained. 				
	<ul style="list-style-type: none"> Jointing and crimping of conductors Discarding wooden cable drum material on site 	<ul style="list-style-type: none"> Waste material littering in veld 	NEMA ECA	<p>Objective:</p> <ul style="list-style-type: none"> No illegal waste disposal on site <p>Mechanisms:</p> <ul style="list-style-type: none"> Any broken insulators shall be removed and all shards picked up. Broken, damaged and unused nuts, bolts and washers shall be picked up and removed from site. 	<ul style="list-style-type: none"> No waste material shall be left on site that may harm man or animals. 			Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
	<ul style="list-style-type: none"> No protection for fences during stringing 	<ul style="list-style-type: none"> Damage to fences 	FA	<p>Objectives:</p> <ul style="list-style-type: none"> No damage to fences <p>Mechanisms:</p> <ul style="list-style-type: none"> All fences shall be protected against damage during stringing operations. All damage to be repaired immediately and to the satisfaction of the landowner. 				Contractor CECO ECO
5. REHABILITATION OF SERVITUDE								
	<ul style="list-style-type: none"> Installation of diversion berms 	<ul style="list-style-type: none"> Prevention of erosion 	CARA	<p>Objectives:</p> <ul style="list-style-type: none"> Prevent erosion during installation of diversion berms <p>Mechanisms:</p> <ul style="list-style-type: none"> Minimise loss of vegetation during installation of diversion berms typical drawings for diversion berms should be made available to landowners Rehabilitate all disturbed areas immediately following installation Avoid extensive vegetation clearing Strive to undertake majority of construction during dry season 				Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
	<ul style="list-style-type: none"> Fixing of fences 	<ul style="list-style-type: none"> Waste material littering in veld 	NEMA ECA	<p>Objectives:</p> <ul style="list-style-type: none"> Prevent waste pollution during fence fixing operations <p>Mechanisms:</p> <ul style="list-style-type: none"> All waste is to be stored in a designated area and removed from site following all works. 				Contractor CECO ECO
	<ul style="list-style-type: none"> Re-seeding of barren areas 	<ul style="list-style-type: none"> Wrong seed used 	BDA FA TRMSCAAC1 REV 3	<p>Objective</p> <ul style="list-style-type: none"> Minimise damage to topsoil and environment at tower positions Successful rehabilitation of all damaged areas Prevention of erosion <p>Mechanisms:</p> <ul style="list-style-type: none"> Re-seeding shall be done on disturbed areas as directed by the Environmental Control Officer. Slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced. Other methods of rehabilitation of tower sites may also be used at the discretion of the Environmental Control Officer, e.g. stone pitching, logging, etc. Contour banks shall be spaced according to the slope on tower sites. The type of soil shall also be taken into consideration. The contractor shall avoid 	<ul style="list-style-type: none"> No loss of topsoil due to construction activities No loss of topsoil due to construction activities All disturbed areas successfully rehabilitated within three months of completion of the contract No visible erosion scars three months after completion of the contract No open fires shall be allowed on site under any circumstance 			Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<p>translocating topsoil stockpiles from one place to another or importing topsoil from other sources that may contain alien plant propagules</p> <ul style="list-style-type: none"> • A mixture of seed can be used provided the mixture is carefully selected to ensure the following: <ul style="list-style-type: none"> ○ Annual and perennial plants are chosen ○ Pioneer species are included ○ All the plants shall not be edible ○ Species chosen will grow in the area without many problems. ○ Root systems must have a binding effect on the soil. ○ The final product should not cause an ecological imbalance in the area. • To get the best results in a specific area, it is a good idea to consult with a vegetation specialist or the local extension officer of the Dept of Agriculture. • Seed distributors can also give valuable advice as to the mixtures and amount of seed necessary to seed a certain area. • Re-seeding, as well as fencing 				

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				in of badly damaged areas, will always be at the discretion of the ECO, unless specifically requested by a Landowner (Specifics about the project, special tower positions, helicopter construction, etc.)				
	<ul style="list-style-type: none"> Picking up all rubble and litter 	<ul style="list-style-type: none"> Servitude left clean and neat 	NEMA ECA HSA	<p>Objectives:</p> <ul style="list-style-type: none"> Rubble and litter removal from site <p>Mechanisms:</p> <ul style="list-style-type: none"> The Contractor shall dispose of all excess material on site in an appropriate manner and at a designated place. All packaging material shall be removed from site and disposed of and not burned on site. No landfill may be used without the consent from the Landowner. Should a landfill be used for biodegradable materials only, the rubble shall be compacted and at least 1m of soil shall cover the waste material. No hazardous material, e.g. oil or diesel fuel shall be disposed of in any unregistered waste site. 				Contractor CECO ECO
	<ul style="list-style-type: none"> Settling of all outstanding 	<ul style="list-style-type: none"> Landowner s happy Servitude 		<p>Objectives:</p> <ul style="list-style-type: none"> Minimize claims and litigation from landowners 	<ul style="list-style-type: none"> Successful completion of the contract with all landowners signing the 			Contractor CECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
	<ul style="list-style-type: none"> g claims Signing off all landowners 	ready for handover to Grid		<p>Mechanisms:</p> <ul style="list-style-type: none"> All anticipated crop damage shall be noted while access negotiations are underway. All damage to commercial crops shall be recorded immediately. The date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure the responsible party is held liable. All claims for compensation emanating from crop damage should be directed to the ECO for appraisal. The Contractor shall be held liable for all unnecessary damage to the environment and crops. A register shall be kept of all complaints from Landowners. All claims shall be handled immediately to ensure timeous rectification / payment. 	<p>release form six months after completion of the project</p> <ul style="list-style-type: none"> All claims investigated and dealt with in one month No litigation due to unsettled claims 			ECO
Fire control	<ul style="list-style-type: none"> Making fires in winter due to cold weather Cooking food on site / smoking 	<ul style="list-style-type: none"> Veld fires 	NVFFA FA	<p>Objective:</p> <ul style="list-style-type: none"> Prevention of veld fires <p>Mechanisms</p> <ul style="list-style-type: none"> No open fires shall be allowed on site under any circumstance The Contractor shall have fire-fighting equipment available on all vehicles working on site.. 	No reported fire incidents	Daily physical checks		Contractor CECO ECO

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				<ul style="list-style-type: none"> Local fire department be included in list of emergency numbers given to contractors onsite and even contact with farmers fire fighting associations/groups. Method statement or fire management plan may also be useful 				
Use veld for toilet		<ul style="list-style-type: none"> Health risk / spreading of measles 	OHSA TRMSCAAC1 REV 3	<p>Objective:</p> <ul style="list-style-type: none"> To prevent spreading of diseases <p>Mechanisms</p> <ul style="list-style-type: none"> The Contractor shall install mobile chemical toilets on site. Staff shall be sensitised to the fact that they should use these toilets at all times. No use of the veld shall be allowed, as this always create problems with the landowners and lead to claims for problems with stock diseases. Toilet paper is also a source of littering in the veld, and the Contractor shall be forced to clean up any litter. Applicable where the transmission power line traverses land where stock (cattle and sheep) and game farming is practised. 				

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
		<ul style="list-style-type: none"> Unauthorised access 		Mechanisms <ul style="list-style-type: none"> No camping shall be allowed on any private property. If the Contractor wants to leave guards on site, it shall only be done with the written consent of the Landowners involved 				Contractor
Transportation of personnel and material to site		<ul style="list-style-type: none"> Trucks breaking and spilling oil 	NWA ECA HSA	See 1.5 above				Contractor CECO ECO
6. WASTE MANAGEMENT								
	<ul style="list-style-type: none"> Erect temporary houses and tents, Erect store for oil, lubricants and parts Install waste collection bins 	<ul style="list-style-type: none"> Waste material / littering Waste foodstuff and food containers 	NEMA TRMSCAAC1 REV 3	Objective: <ul style="list-style-type: none"> To avoid pollution of environment with solid wastes To keep the servitude neat and clean Disposal of rubble and refuse in an appropriate manner To avoid water contaminations and soil pollution caused by oil spills Mechanisms: <ul style="list-style-type: none"> No material shall be left on site that may harm man or animals. Littering by the employees of the Contractor shall not be 	<ul style="list-style-type: none"> No solid waste stored on site No incidents recorded No complaints from Landowner No litigation cases No visible spillages of oil or concrete No rubble or refuse lying around on site No incidents of litigation No complaints from Landowners 	<ul style="list-style-type: none"> The ECO shall monitor the neatness of the work sites as well as the campsite. ECO to record all incidents and report same to Project Manager ECO to 		

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				allowed <ul style="list-style-type: none"> • Ensure sufficient waste bins/containers are made available for waste control. • The Contractor shall collect all litter and dispose thereof in a suitable manner on a regular basis. • Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management • Under no circumstances may solid waste be burned or buried on site unless burned off-site in a registered facility. 		recommend corrective action		
6. SOCIAL ISSUES								

4.1 Activity and associated impacts during Construction Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
6.1. Landowner relations				<p>Objectives:</p> <ul style="list-style-type: none"> Maintain good relations with Landowners <p>Mechanisms:</p> <ul style="list-style-type: none"> Ensure that landowners are made aware of Eskom staff presence on their properties prior to the staff arriving on site. Where pylon positions are located on playing fields or other public facilities, moving of the pylon position along the approved alignment should be investigated or alternatively, the landowners should be compensated appropriately. 	<ul style="list-style-type: none"> No delays in the project due to Landowner interference No Claims or litigations from landowner Landowner signs final release form 			Contractor CECO
6.2. Interaction of staff	Staff activities	<ul style="list-style-type: none"> Job creation General incidents 		<p>Objective:</p> <ul style="list-style-type: none"> Wherever possible local labour should be used. Avoid interactions between farm labourers and construction staff. 				Contractor CECO

4.2 Activity and associated impacts during Operation Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
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6.3 Maintenance	Removal of alien and invasive vegetation	<ul style="list-style-type: none"> Hardware 	TRMAGAAZ3	<p>Objective:</p> <ul style="list-style-type: none"> Periodic removal of exotic species from the power line servitude <p>Mitigation:</p> <ul style="list-style-type: none"> Only exotic species to be removed in a suitable manner to avoid unnecessary disturbance to the environment Registered pest control agent to administer herbicides Construction activities must not interfere with the protected tree (<i>sclerocarya birrea</i>) growing along the power line route unless a necessary permit has been obtained to do so. 	<ul style="list-style-type: none"> No exotic species noted/recorded along the power line servitude 	<ul style="list-style-type: none"> To be monitored by grid staff when undertaking maintenance operations 	During maintenance operations	Eskom grid staff Landowner
	Access Roads	<ul style="list-style-type: none"> Erosion Power line faults Breeding of raptors and stocks disturbed (if any) 	TRMAGAAZ3	<p>Objective:</p> <ul style="list-style-type: none"> Prevent erosion of access roads Prevent bird electrocutions and subsequent power line faults <p>Mitigation:</p> <ul style="list-style-type: none"> Access roads to be maintained on a periodic basis. Removal of excess vegetative growth but not to a degree that may cause 	<ul style="list-style-type: none"> Access roads neat and clean of vegetation Excess bare soil not visible adjacent to access roads Known areas where raptors occur. Regular monitoring of nest sites. 	<ul style="list-style-type: none"> To be monitored by grid staff when undertaking maintenance operations 	During maintenance operations	Eskom grid staff Landowner

4.2 Activity and associated impacts during Operation Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				noted <ul style="list-style-type: none"> Utilise existing tracks and roads where possible. Construction of access roads must not interfere with the protected tree (<i>sclerocarya birrea</i>) growing along the power line route unless a necessary permit has been obtained to do so. 				
Grass Cutting Disposal of cut material		<ul style="list-style-type: none"> Shaving grass down to the soil level (erosion potential) 	TRMAGAAZ3	Objective: <ul style="list-style-type: none"> Maintain a low grass cover along access roads and around tower positions Mitigation: <ul style="list-style-type: none"> Cut grass only when necessary Dispose of grass cuttings in an environmentally friendly manner. 	<ul style="list-style-type: none"> Access roads neat and clean of vegetation Excess vegetation removal not visible adjacent to access roads 	<ul style="list-style-type: none"> To be monitored by grid staff when undertaking maintenance operations 	During maintenance operations	Eskom grid staff Landowner
Wild Life Interaction, cattle, game, birds, protected species		<ul style="list-style-type: none"> Collision of birds with overhead power lines Habitat destruction Disturbance of breeding avifauna 	TRMAGAAZ8	Objective: <ul style="list-style-type: none"> Prevent collision of birds with overhead power lines Ensure that the abundance and diversity of all faunal species are maintained through effective management Mitigation: <ul style="list-style-type: none"> Use bird flight diverters and bird flappers Monitor all identified 'hot spot' bird collision areas as per 	<ul style="list-style-type: none"> Few to no instances of wildlife mortality noted within the servitude 	<ul style="list-style-type: none"> To be monitored by grid staff when undertaking maintenance operations Landowner to monitor randomly 	During maintenance operations by Eskom grid staff. Random surveys by landowner	Eskom grid staff Landowner

4.2 Activity and associated impacts during Operation Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
				avifauna report and mitigate appropriately				
	Herbicides	<ul style="list-style-type: none"> Over use of herbicides leading to large scale floral mortality in the general area 	TRMAGAAZ2	<p>Objectives:</p> <ul style="list-style-type: none"> To control the use of herbicides to ensure maximum effectiveness with minimal impact on other species. <p>Mitigation:</p> <ul style="list-style-type: none"> Only use herbicides in areas where manual removal is not possible. Only use herbicides under prescribed dosages. Do not use herbicides as a means to save time. 	<ul style="list-style-type: none"> No significant visible damage to non-targeted species 	<ul style="list-style-type: none"> Eskom grid staff and landowner to monitor whenever on site. 	<p>During maintenance operations by Eskom grid staff.</p> <p>Random surveys by landowner</p>	<p>Eskom grid staff</p> <p>Landowner</p>
6.4 Power line Patrol	Foot Patrols	<ul style="list-style-type: none"> Interference with game, cattle etc. Leaving gates open 	TRMSCAAC1	<p>Objectives:</p> <ul style="list-style-type: none"> To ensure a low impact patrol on foot both on wildlife as well as on farmsteads <p>Mitigation:</p> <ul style="list-style-type: none"> Foot patrol personnel must adhere to all aspects of the EMP at all times. Gates to be closed upon entry unless they are open prior to approaching. 	<ul style="list-style-type: none"> No objections received from landowners regarding foot patrols 	<ul style="list-style-type: none"> Landowner to report any contraventions to Eskom 	Ongoing	<p>Eskom grid staff</p> <p>Foot patrol personnel</p> <p>Landowner</p>
			TRMSCAAC1		<ul style="list-style-type: none"> No objections received from landowners regarding vehicle patrols 		Ongoing	
	Vehicle Patrol	<ul style="list-style-type: none"> Interference with game, cattle etc. 			<p>Objectives:</p> <ul style="list-style-type: none"> To ensure a low impact patrol by vehicles both on wildlife as 		<ul style="list-style-type: none"> Landowner to report any contravention 	

4.2 Activity and associated impacts during Operation Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
		<ul style="list-style-type: none"> Leaving gates open Use of vehicle on non-authorized access roads 		well as on farmsteads Mitigation: <ul style="list-style-type: none"> Vehicle patrol personnel must adhere to all aspects of the EMP at all times. Gates to be closed upon entry unless they are open prior to approaching. 		s to Eskom		personnel Landowner
	Helicopter Patrol	<ul style="list-style-type: none"> Interference with game, cattle etc. 	TRMSCAAC1	Objectives: <ul style="list-style-type: none"> To ensure a low impact patrol by helicopters both on wildlife as well as on farmsteads Mitigation: <ul style="list-style-type: none"> Farmers must be informed well in advance of helicopter patrols for animal location planning purposes 	<ul style="list-style-type: none"> No objections received from landowners regarding helicopter patrols 	<ul style="list-style-type: none"> Landowner to report any contraventions to Eskom 	When helicopters are in use	Eskom grid staff Pilot Landowner
6.5 Rehabilitation	Servitude rehabilitation	<ul style="list-style-type: none"> Inappropriate rehabilitation methods result in negative issues such as increased erosion 	TRMAGABE0	Objectives: <ul style="list-style-type: none"> To rehabilitate servitudes to a state that is sustainable in the long-term Mitigation: <ul style="list-style-type: none"> Rehabilitate all disturbed areas Ensure vegetative cover is natural and sufficient to eliminate erosion potentials 	<ul style="list-style-type: none"> Servitude length is suitably rehabilitated that erosion is not a concern Rehabilitation to include a range of indigenous species characteristic of the area 	<ul style="list-style-type: none"> To be monitored by grid staff when undertaking maintenance operations Landowner to monitor randomly 	During maintenance operations by Eskom grid staff. Random surveys by landowner	Eskom grid staff Landowner
	Hardware Rehabilitation	<ul style="list-style-type: none"> Unnecessary damage to 	TRMAGABE0	Objectives: <ul style="list-style-type: none"> Rehabilitate hardware in a manner that does not result in 	<ul style="list-style-type: none"> No unnecessary disturbances noted in the areas in which hardware 	<ul style="list-style-type: none"> Ongoing monitoring during 	During and after hardware rehab	Eskom grid staff Landowner

4.2 Activity and associated impacts during Operation Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
		surrounding vegetation during hardware rehabilitation <ul style="list-style-type: none"> Waste strewn in area of rehabilitation 		unnecessary disturbances to the surrounding areas. Mitigation: <ul style="list-style-type: none"> Remain within the authorised servitude at all times. Remove all waste material from site following rehabilitation Rehabilitate all disturbed areas following hardware rehabilitation 	rehabilitation has been undertaken <ul style="list-style-type: none"> No waste materials noted in the areas in which hardware rehabilitation has been undertaken 	hardware rehab <ul style="list-style-type: none"> A final site check following rehab to ensure no waste or damage to surrounding areas 		
6.6 Land Owner Interaction	Maintain good relations	<ul style="list-style-type: none"> Objections received from landowners for contraventions of the EMP 		Objectives: <ul style="list-style-type: none"> Maintain good relations with the landowners Mitigation: <ul style="list-style-type: none"> Inform landowners each time access to their farms is required Provide contact details to landowner for responsible Eskom representative Close gates should always be closed. Stick to speed limits and use only agreed/approved roads etc? 	<ul style="list-style-type: none"> No negative feedback is received from landowners 	Based on feedback from landowners	During and after any work on landowner properties	Eskom grid staff
6.7 Control of illegal encroachment on the servitude	Informal development sprawl	<ul style="list-style-type: none"> Electrocution Power line faults 		Objectives: <ul style="list-style-type: none"> Maintain vigilance of any encroaching developments on the power line servitude Mitigation: <ul style="list-style-type: none"> Regular patrols by Eskom Staff 	<ul style="list-style-type: none"> No encroachment on power line servitude Timely relocation of any encroachments 	During any maintenance procedures	During maintenance procedures	Eskom grid staff

4.2 Activity and associated impacts during Operation Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
6.8 Agricultural Activities	Forestry	<ul style="list-style-type: none"> Negative impacts on agricultural activities as a result of maintenance procedures, servitude clearing etc. Soil compaction 		Objectives: <ul style="list-style-type: none"> To limit the impact on agricultural activities Mitigation: <ul style="list-style-type: none"> Maintain good relations with landowners Consult farmers prior to any crop clearing activities Remain within the servitude at all times Measures to limit soil compaction should be in place. 	<ul style="list-style-type: none"> No encroachment into agricultural crops No negative feedback from landowners 	During and after any maintenance procedures	During and after maintenance procedures	Eskom grid staff Landowners
6.9 Agricultural Activities	Maize/Beans/potatoes	<ul style="list-style-type: none"> Negative impacts on agricultural activities as a result of maintenance procedures, servitude clearing etc. 		Objectives: <ul style="list-style-type: none"> To limit the impact on agricultural activities Mitigation: <ul style="list-style-type: none"> Maintain good relations with landowners Consult farmers prior to any crop clearing activities Remain within the servitude at all times 	<ul style="list-style-type: none"> No encroachment into agricultural crops No negative feedback from landowners 	During and after any maintenance procedures	During and after maintenance procedures	Eskom grid staff Landowners
	Grazing	<ul style="list-style-type: none"> Negative impacts on agricultural activities as 					During and after maintenance procedures	

Objectives:

- To limit the impact on agricultural activities

Performance Indicators:

- No encroachment into agricultural crops
- No negative feedback from landowners

Monitoring Method:
 During and after any maintenance procedures
Schedule/Frequency:
 During and after maintenance procedures
Responsible Party:
 Eskom grid staff
 Landowners

4.2 Activity and associated impacts during Operation Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
		a result of maintenance procedures, servitude clearing etc.		Mitigation: <ul style="list-style-type: none"> Maintain good relations with landowners Consult farmers prior to any crop clearing activities Remain within the servitude at all times 				
	Game Farm	<ul style="list-style-type: none"> Negative impacts on agricultural activities as a result of maintenance procedures, servitude clearing etc. 		Objectives: <ul style="list-style-type: none"> To limit the impact on agricultural activities Mitigation: <ul style="list-style-type: none"> Maintain good relations with landowners Consult farmers prior to any crop clearing activities Remain within the servitude at all times Ensure that all gates are closed upon entering game enclosed areas. 	No encroachment into agricultural crops No negative feedback from landowners	During and after any maintenance procedures	During and after maintenance procedures	Eskom grid staff Landowners
6.10 Fire Management	Fire hazards	<ul style="list-style-type: none"> Loss of agricultural crops Loss of homesteads Loss of life 		Objectives: <ul style="list-style-type: none"> Ensure that all fires are under control. Mitigation: <ul style="list-style-type: none"> When required, fire breaks must be implemented around all sensitive structures/crops Fire fighting equipment to be at hand during burns 	No run-away fires reported No loss of agricultural crops, homesteads or life	During fire management, a suitably qualified professional must be on site at all times to monitor the burn	When necessary to burn as indicated by a suitably qualified professional	Eskom grid staff Suitably qualified professional (in fire management)

4.2 Activity and associated impacts during Operation Phase

ACTIVITY / ISSUE	ASPECTS	POSSIBLE IMPACTS	RELEVANT LEGISLATION/ ESKOM SPEC	MITIGATION MEASURES	PERFORMANCE INDICATORS	MONITORING METHOD	SCHEDULE/ FREQUENCY	RESPONSIBLE PARTY
6.11 Aviation activity	Collision	<ul style="list-style-type: none"> Collision with aircrafts 		<p>Objective:</p> <ul style="list-style-type: none"> Prevent collision with aircrafts <p>Mitigation:</p> <ul style="list-style-type: none"> Use aircraft warning spheres across deep valleys in forested areas Investigate the implementation of warning spheres in areas where pilots have recommended them. 	No objections from pilots received for any span of line			Eskom grid staff
6.12 Archaeological sites	Damage or destruction of these sites	<ul style="list-style-type: none"> Damage or destruction of these sites 	SAHRA	<p>Objective:</p> <ul style="list-style-type: none"> Prevent destruction of these sites To prevent and/ or mitigate the negative impacts on heritage and cultural resources <p>Mitigation:</p> <ul style="list-style-type: none"> Mark these sites clearly and make staff aware of their location, characteristic and significance Avoid outcrops, bare patches of vegetation and watercourses as these may be associated with heritage and cultural resources. 	No damage to archaeological sites reported	To be inspected at random by grid staff as well as landowner	Ongoing	Eskom grid staff Landowner

4. SPECIALISTS RECOMMENDATIONS AND MITIGATIONS MEASURES FOR AFFECTED PYLONS

5.1 Avifauna

This specialist avifaunal report identifies avifaunal related impacts and their location and recommends suitable mitigation measures that can be implemented to minimise the impacts during operation of the power line. Proposed mitigation measures include the following:

5.1.1 Collision with overhead cables

As identified in the EIA, all sections of line passing through or adjacent to the following areas must be fitted with a suitable marking device on the earth wires as per Eskom technical guidelines: Dams, Wetlands, Drainage lines, Rivers and river crossings, Grasslands, Centre Pivot Irrigation and Large valleys.

The sections of line requiring marking are identified in Table 1. Marking power lines has been shown to significantly reduce the number of bird collisions. A detailed description of those spans of power line that require marking with bird flight diverters is outlined below in the table. Specifications for the correct marking of both earth wires can be found in Appendix 1 of the attached Avifauna report.

5.1.2 Habitat destruction during the construction activities

Relevant to this study, the most sensitive areas are dams, rivers and wetlands. All construction activities should be carried out according to generally accepted environmental best practices. Existing roads must be used as far as possible for access during construction. No roads or vehicle or heavy machinery to be allowed in wetland area, and indigenous bush.

5.1.3 Disturbance during the construction activities

Relevant to this study, the most sensitive areas are dams, rivers and wetlands. All construction activities should be carried out according to generally accepted environmental best practices. No vehicles or heavy machinery should be allowed to traverse sensitive areas.

Where nesting birds are found in close proximity to the construction sites, or on the existing lines adjacent to the new lines the EWT must be contacted for case specific advice on dealing with the nests.

As a general principle, construction activities should ensure minimal disturbance to the receiving environment and in particular areas around dams, rivers and pans. Through implementation of the above it is envisaged that the disturbance impact of the proposed lines can be kept to acceptable levels.

5.1.4 Impact of birds on quality of electrical supply

Fit bird guards to all self support towers to proactively mitigate for bird induced faulting. If the cross rope suspension tower is not used more towers may need to be bird guarded. This can, however, be done reactively if faulting is recorded.

5.1.5 Nesting of bird on towers (positive impact on birds)

As this is a positive impact on the bird species in the area, no mitigation is recommended

5.1.6 Responsibility

The overall responsibility lies with the ECO to ensure that the guidelines and specifications detailed in this report and its appendices are adhered to and that all mitigation devices are installed correctly.

Possible issues associated with particular pylons are listed in the table below. The table also provides the recommended mitigations measures to be implemented at each of the pylon (tower) positions.

Table 1: Identified environmental aspects and mitigations measures

Tower Number	Issue/ Environmental Aspect	Mitigation / Possible solution
T3 - 4	Drainage Line	Fit Bird Flight Diverter in accordance with Eskom guidelines (Appendix 1)
T23 - 24	River/ Stream	
T30 - 50	Centre pivot irrigation and River/Stream	
T62 - 63	Drainage Line	
T67 - 72	River/ Stream	
T83 - 84	Drainage Line	
T101 - 108	Centre pivot irrigation and River/Stream	
T111 - 115	Drainage Line	
T135 - 138	Centre pivot irrigation and River/Stream	
T184 - 187	Drainage Line	
T211 - 212	Drainage Line	

5.2 Heritage

The aim of this survey was to analyse and recommend heritage management mitigation measures and monitoring programmes for sites, features and objects within the corridor of the proposed power line. Information on the identified sites is presented in Table 2 and Figure 5 below). Based on the heritage specialist investigation undertaken the following was found during the site walkthrough:

- A number of stone walled sites dating to the Late Iron Age were identified. On some the line just crosses over, whereas on others a tower structure will be erected (Identified site No. 5, 6, 7, 12, 13 & 15).
 - As it is difficult to demarcate this type of site, it is recommended that an archaeologist is in attendance when construction takes place on the site.
- One old farmstead was identified and is viewed to have a low significance on a regional level. In many cases graves are found in the vicinity of such old homesteads. However, due to the dense vegetation surrounding the buildings, it was difficult to determine if there are any graves located here (Identified site No 2).
 - It is recommended that these features are isolated by demarcating a 50m buffer zone around it, taking the outside of the buildings as starting point for determining the buffer.
- A number of farm labourer homesteads were identified. Most of these are located outside the corridor. One would be directly impacted on by a tower (Identified site No. 4, 9, 10, 11 & 16).

- It is recommended that these features are isolated by demarcating a 50m buffer zone around it, taking the outside of the buildings as starting point for determining the buffer.
- Some features that are probably related to gold mining activities occur in an area. These are the remains of buildings and other infrastructure developments (Identified site No. 17 & 18).
 - The power line would cross these sites. The developer to take note that such features do occur and when working in the area due consideration should be taken not to disturb these features.
- Four informal cemeteries of differing size were identified. They are viewed to have a high significance on a local level (Identified site No. 1, 3, 8 & 14).
 - All four cemeteries are located inside the corridor for the power line, or very close to it. These features should be left in place and isolated by demarcating a 20m buffer around them starting from the outermost graves that can be located.
- The remains of some structures that might be related to old gold mining activities were identified (Identified site No. 17, 18).
 - Tower 199 would be located on site 17. It is recommended that an archaeologist is in attendance when construction takes place on the site.

Furthermore the following general management measures should be undertaken during various stages of the project:

Construction phase

- Known sites should be clearly demarcated in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction work.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;

- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

Operation phase

- Continued care should be taken to observe discovery of any sites of heritage significance during operation. Should any archaeological artifacts and palaeontological remains be exposed during operations, work on the area where the artefacts were found, shall cease immediately and the appropriate person shall be notified as soon as possible;
- Upon receipt of such notification, an Archaeologist or Palaeontologist shall investigate the site as soon as practicable. Acting upon advice from these specialists, the necessary actions shall be taken;
- Under no circumstances shall archaeological or palaeontological artefacts be removed, destroyed or interfered with by anyone on the site during operations; and
- The operator shall advise its workers of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51(1).

Possible issues associated with particular pylons and the power line are listed in the table below. The table also provides the recommended mitigations measures to be implemented.

Table 2: Identified site and mitigation measures

Identified sites	Classification	Name	Latitude	Longitude	Significance	Impact	Management
1	Historic	Cemetery	-23.66097	29.70557	High on a local level	Located very close to line and Tower 77	Temporarily demarcate and avoid
2	Historic	Farmstead	-23.7277	29.66849	Low on a regional level	Located very close to line, but not the tower	Temporarily demarcate and avoid
3	Historic	Cemetery	-23.78229	29.63275	High on a local level	Located very close to line and Tower 112	Temporarily demarcate and avoid
4	Historic	Multi-component site	-23.88139	29.61732	Medium on a regional level	Tower 137 will be on the site, but not on structures. Line will cross structures	Archaeologist in attendance during construction
5	Iron Age	Stone walled site	-23.90219	29.61709	High on a regional level	Located very close to line, but not the tower	Temporarily demarcate and avoid
6	Iron Age	Stone walled site	-23.90586	29.61405	High on a regional level	Located very close to line, but not the tower	Temporarily demarcate and avoid
7	Iron Age	Stone walled site	-23.90768	29.61267	High on a regional level	Line will cross over a section of the site	Archaeologist in attendance during construction
8	Historic	Cemetery	-23.9314	29.60784	High on a local level	Located very close to line, but not the tower	Temporarily demarcate and avoid
9	Historic	Labourer homestead	-23.93238	29.60714	Low on a regional level	Located very close to line, but not the tower	Temporarily demarcate and avoid
10	Historic	Labourer homestead	-23.93515	29.60635	Low on a regional level	Located very close to line, but not the tower	Temporarily demarcate and avoid
11	Historic	Labourer homestead	-23.93585	29.60647	Low on a regional level	Located very close to line, but not the tower	Temporarily demarcate and avoid
12	Historic	Stone walled site	-23.95726	29.57352	Medium on a regional level	Located very close to line, but not the tower	Temporarily demarcate and avoid
13	Iron Age	Stone walled site	-23.95979	29.56339	High on a regional level	Line will cross over a section of the site	Archaeologist in attendance during construction
14	Historic	Graves	-23.95955	29.56156	High on a local level	Tower 164 will be on the site, but not on structures. Line will cross structures	Archaeologist in attendance during construction
15	Iron Age	Stone walled site	-23.95885	29.56141	High on a local level	Located very close to line, but not the tower	Temporarily demarcate and avoid
16	Historic	Labourer homestead	-23.96064	29.55774	Medium on a regional level	Tower 165 will be on structure. Relocate tower or implement Phase 2 investigation of site	SAHRA permit and excavate prior to construction
17	Historic	Gold fields	-24.00547	29.43629	Low on a regional level	Tower 199 will be on the site, but not on structures. Line will cross structures	Archaeologist in attendance during construction
18	Historic	Claim marker	-24.01276	29.41627	Low on a regional level	Located very close to line and Tower 204	Temporarily demarcate and avoid

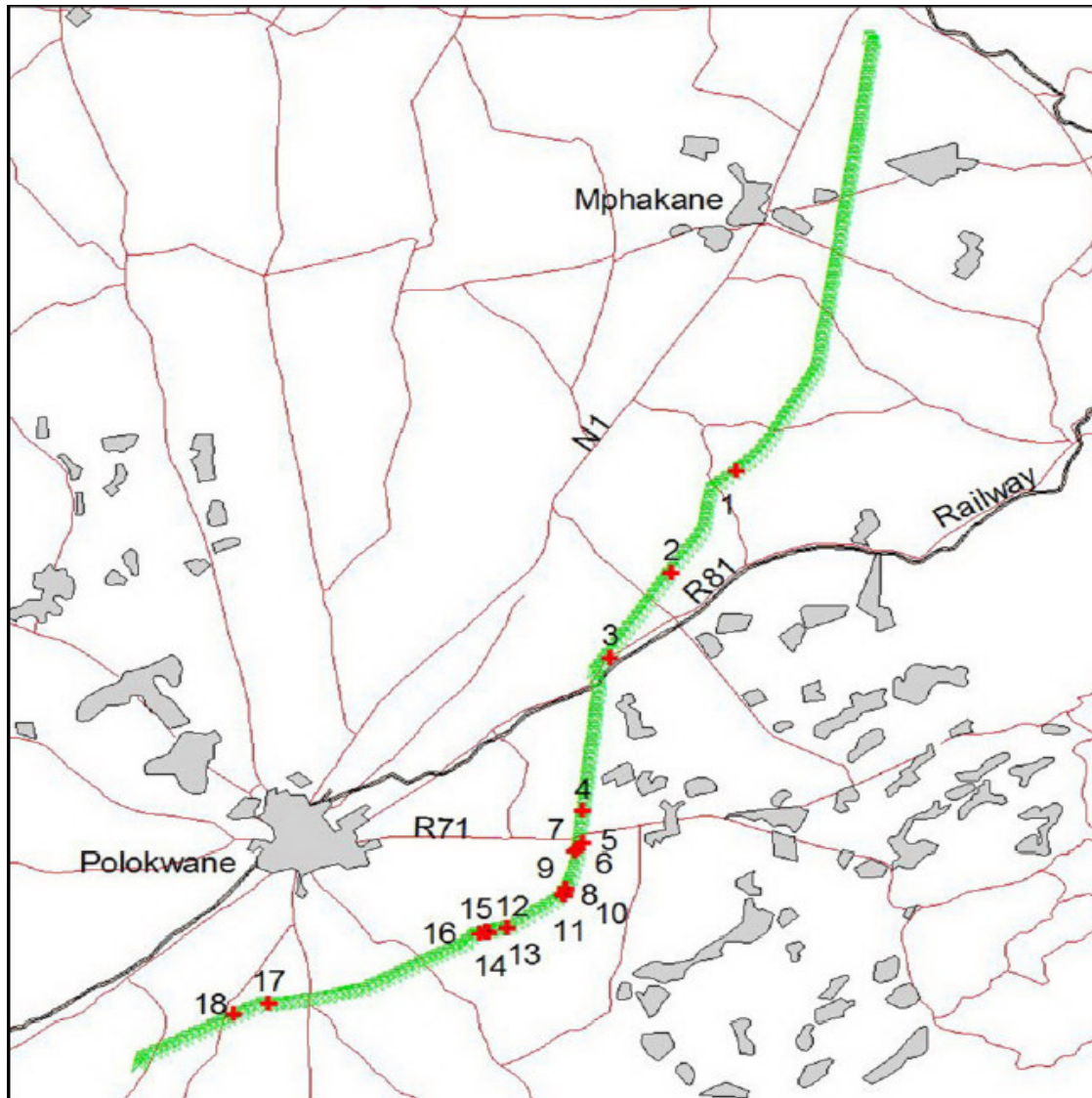


Figure 4: The study area, showing the location of the identified sites.

(Map 2329BA, 2329DA, 2329DB, 2329DC, 2329CD, 2429AB: Chief Directorate Survey & Mapping)

5.3 Ecology

The ecological survey was aimed at the following:

- Assessment of ecological sensitivities; and
- Provision of suitable and relevant mitigation measures and/or alternatives.

Vegetation along the proposed route may be described at various hierarchical levels from Biome, to broad Vegetation Type and down to Plant Community level associated with local habitat conditions. The most recent vegetation map for South Africa (Mucina et al., 2005) indicates that the alignment falls primarily within Makhado Sweet Bushveld and Polokwane Plateau Bushveld, with some local outcrops of Mamabolo Mountain Bushveld in places.

According to the ecological specialist the season of the survey constitutes a potential limitation. All pylon positions were visited and assessed, however, due to the fact that the study constituted a single survey during the spring season it is unlikely that all species that occur on site were observed.

Red Data plant and Animal species

Lists of threatened plant species previously recorded in the study area in which the proposed infrastructure is situated were obtained from the South African National Biodiversity Institute (SANBI) and literature sources. The species on this list were checked for recent IUCN assessments. There are nine species on this list, of which two could occur in habitats along the proposed alignment (*Commelina rogersii* and *Elaeodendron transvaalense*). Neither of these species was seen during the field survey (refer to Appendix 3 of the attached Ecological specialist report).

There are three Red List mammal species that have a HIGH chance of occurring in the general study area, depending on habitat availability, many of which have been previously recorded in grids within the study area. These are the Brown Hyaena, Southern African Hedgehog and Pangolin. All three could potentially occur in a wide variety of habitats. However, they all have relatively wide geographical distribution patterns, are unlikely to be restricted to specific sites and can move out of the way of construction to return at a later stage once construction is completed. It is therefore considered highly unlikely that construction of the power line will negatively affect any of these three species to a significant extent. None of these species were observed during the field survey. No specific measures are proposed to manage potential impacts on these species (please refer to Appendix 2a of the attached ecological report).

There are two Red List reptile species that have a distribution that includes the study area, but neither of them are likely to occur along the alignment because no suitable habitat exists (please refer to Appendix 2Bb of the attached ecological report).

There is one Red List amphibian that could occur in the study area a distribution that includes the study area, the Giant bullfrog, but is not likely to occur along the alignment because no suitable habitat exists. This species occurs in seasonal, shallow grassy pans in flat open areas, but also utilises non-permanent vleis and shallow water on the margins of waterholes and dams. It has not previously been recorded in the study area and, on the basis of habitat requirements, has a LOW chance of occurring in the current study area (please refer to Appendix 2c of the attached ecological report).

On the basis of the location of areas of natural habitat and the potential for habitat to support species of concern or to contain high levels of biodiversity, the rocky areas and rocky outcrops are considered, in general, to have elevated sensitivity and the lowland plains, in general, to have low sensitivity, especially where they have been disturbed by cultivation. There are various places along the alignment, especially in the northern half, where medium to high densities of protected trees are found. The positions of these are reported per tower, but these protected trees also occur in the areas between towers.

Protected trees

There are a number of tree species that are protected according to Government Notice no. 1012 under section 12(l)(d) of the National Forests Act, 1998 (Act No. 84 of 1998). In terms of section 15(1) of the National Forests Act, 1998 “no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated”. A list of protected trees of South Africa is provided in Appendix 3 of the attached Ecological specialist report. Those that could occur in the study area are as follows: *Acacia erioloba*, *Boscia albitrunca*, *Catha edulis*, *Combretum imberbe*, *Curtisia dentata*, *Elaeodendron transvaalensis*, *Pittosporum viridiflorum*, *Podocarpus latifolius*, *Prunus africana* and *Sclerocarya birrea* subsp. *caffra*.

5.3.1 Results

Possible issues associated with particular pylons are listed in table below. Recommended measures to deal with the identified issues have been proposed as well.

Table 3: Identified problems with particular pylon position and possible mitigation measures to address such problems.

Tower	Issue	Mitigation / possible solution
T8	<u>Ecological issue:</u> occasional <i>Boscia albitrunca</i> (protected)	Get permit to impact on protected tree species.
T9	<u>Ecological issue:</u> occasional maroela trees (protected)	Get permit to impact on protected tree species.
T12	<u>Ecological issue:</u> occasional maroela trees (protected)	Get permit to impact on protected tree species.

T14	<u>Ecological issue</u> : occasional maroela trees (protected)	Get permit to impact on protected tree species.
T27-28	<u>Ecological issue</u> : tower close to watercourse	Ensure no impacts on watercourse, otherwise get water use license
T45-46	<u>Ecological issue</u> : occasional to frequent maroela trees (protected)	Get permit to impact on protected tree species.
T47	<u>Ecological issue</u> : occasional <i>Boscia albitrunca</i> (protected)	Get permit to impact on protected tree species.
T55	<u>Ecological issue</u> : occasional maroela trees (protected)	Get permit to impact on protected tree species.
T57-61	<u>Ecological issue</u> : occasional to frequent maroela trees (protected)	Get permit to impact on protected tree species.
T64-66	<u>Ecological issue</u> : occasional to frequent maroela trees (protected)	Get permit to impact on protected tree species.
T73-78	<u>Ecological issue</u> : occasional to frequent maroela trees (protected)	Get permit to impact on protected tree species.
T85-88	<u>Ecological issue</u> : high density of maroela trees (protected)	Get permit to impact on protected tree species.
T90-92	<u>Ecological issue</u> : scattered maroela trees (protected)	Get permit to impact on protected tree species.
T147	<u>Ecological issue</u> : grove of the protected maroela tree nearby	Avoid grove of trees <u>OR</u> get permit to impact on protected tree species.
T163	<u>Ecological issue</u> : rocky outcrop.	Move alignment slightly southwards at this point to avoid putting tower on rocky outcrop.
T165	<u>Ecological issue</u> : small rocky outcrop with unique species composition.	Move tower slightly along alignment to avoid outcrop.
T220	<u>Ecological issue</u> : wet area associated with small farm dam. Not natural, but supports wetland vegetation.	Consider moving pylon out of wet area. If not possible, then construct pylon at end of dry season to minimize trampling effects on soil and vegetation in wet area.

Most of the power line towers are positioned in areas that are transformed by cultivation and rural settlement or are in natural vegetation that is not considered to be especially sensitive. There are, however, some areas that are classified as having Medium-High sensitivity due to the following factors: existence of protected trees, wetlands and/or watercourses, and vegetation with high local species richness, structural variation and high turnover from one site to another due to high habitat diversity, especially in rock outcrops or in rocky habitats.

Measures or permit requirements are proposed to limit damage to these areas or obtain authorization to cause impacts. The most common issue is the presence of protected trees. It is NOT recommended that an alternative alignment is found, because any alternative alignment through this northern region is likely to encounter similar densities of protected trees.

A slight alignment modification is proposed for T163 to avoid a rocky outcrop. Other sensitive features, as listed in Table 3 above, can be avoided by shifting tower positions within the alignment without changing the alignment.

5.3.2 Recommendations

The following recommendations measures have been made by the ecology specialist and can help to reduce site-specific impacts:

- Protected trees occur in many places along the alignment. A permit is required if any of these trees are going to be disturbed or damaged by construction or management of the power line.
- There are limited areas where wetlands or watercourses occur along the alignment or close to tower positions. All necessary steps must be taken to avoid causing impacts on these areas. If impacts cannot be avoided then a water use license must be obtained to permit an impact upon a water resource.
- Alien plants must be controlled along the power line and service road servitude as well as within any areas controlled by Eskom. This should take place during and after construction and may require long-term follow-up.
- During construction, sensitive habitats must be avoided by construction vehicles and equipment, wherever possible, in order to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld must not take place.

5. OUTLINE OF RECORD OF DECISION CONDITIONS

Refer to Appendix E for a copy of the Record of Decision (RoD) issued for this project.

Authorisation is granted in terms of the National Environmental Management Act, 1998 (Act no. 107 of 1998) and the Environmental Impact Assessment Regulations, 2006 for the proposed construction of the Tabor – Witkop 400kV transmission power line, Limpopo Province. The granting of environmental authorisation is subject to the conditions set out below:

6.1 Conditions

Scope of Authorisation

- Authorisation of the activity is subject to the conditions contained in this authorisation, which form part of the environmental authorisation and are binding on the holder of the authorisation

- The holder of the authorisation shall be responsible for ensuring compliance with the condition by any person acting on his or her behalf, including but not limited to, an agent, sub-contractor, employee or person rendering a service to the holder of the authorisation.
- The activity authorised may only be carried out on the Proposed Alternative route, as shown on the site maps of the Environmental Impact Report, dated September 2007.
- Any changes to, or deviation from, the project description set out on the Environmental Impact Report (EIR), dated September 2007, and authorised under this authorisation must be approved, in writing, by the Department before such changes or deviation may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations and it may be necessary for the holder of the authorisation to apply for further authorisation in terms of the regulations.
- This activity must commence within a period of (5) years from the date of issue. If commencement of the activity does not occur within that period the authorisation lapses and a new application for environmental authorisation must be made in order for the activity to be undertaken.
- The authorisation does not negate the holder of the authorisation responsibility to comply with any other statutory requirements that may be applicable to the undertaking of the activity.
- Relevant legislation that must be complied with by the holder of the authorisation include but is not limited to:
 - All provisions of the Occupational Health and Safety Act, 1993 (Act 85 of 1993),
 - This authorisation is subject to compliance with the requirements of Section 38(1), (3) and 97) of the National Heritage Resources Act, Act 25 of 1999, including the comments and recommendations of the relevant heritage resources authority responsible for the area in which the development is proposed,
 - Provision of the National Water Act, 1998 (Act 36 of 1998).

Management of the activity

- A Draft Environmental Management Plan (“EMP”) submitted as part of the application for environmental authorisation is approved. The final site specific

(Proposed Alternative) Environmental Management Plan (“EMP”) for construction which fulfils the requirements of this authorisation must be compiled and submitted to the Department for approval before the construction process commence. The EMP must comply with regulation 34 of the EIA regulations, 2006 and must include, but not limited to the following:

- A site specific plan for erosion and sedimentation control during construction, maintenance and operation phases of the project
- A plan for rehabilitation of all areas to be disturbed during the construction phase of the project. Only indigenous plants may be utilised for rehabilitation.
- Management and rehabilitation of access roads to individual construction areas that will not become permanent roads upon completion of construction.
- A site specific plan for the installation of mitigation measures to reduce and prevent avifauna interaction with the new power lines.
- A site specific plan for the protection of indigenous vegetation where construction activity will take place.
- The EMP must form part of the contractor’s tender documentation for all contractors’ working on the project and must be endorsed contractually.
- The applicant must appoint an Environmental Control Officer (ECO) that will have the responsibility of implementing the EMP.
 - The ECO shall be appointed one month before the start of construction and the authorities must be notified of such an appointment for communication purposes.
 - The ECO shall submit a bi-monthly environmental compliance report, in writing, to the Department and copy the Applicant with such report. This report shall include a description of all activities on site, problem identified, transgression noted and a task schedule of tasks undertaken by the ECO. The report must reflect the reference number of the project on the cover page.
 - The ECO shall maintain the following on site
 - A site diary
 - Copies of all monthly reports submitted to the Department
 - A schedule of current site activities including the monitoring of such activities
 - A complaints register of all public complaints and the remedies applied to such complaints

- The ECO shall 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 for operation.

Commissioning of the activity

- Fourteen (14) days written notice must be given to the Department that the activity will commence. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the activity will end.
- The working area must be clearly demarcated and fenced off during the construction phase and all construction activities must be confined to this area.

Site closure

- Should the activity ever cease or become redundant, the applicant shall undertake the required actions as prescribed by legislation at the time and comply with all relevant legal requirements administered by any relevant and competent authority at that time.

Specific Conditions

- All recommendations outlined in the specialist reports contained in the final Environmental Impact Report produced by SEF (Pty) Ltd dated September 2007, (geotechnical investigation, soils and agricultural potential study, ecological assessment, avifauna assessment, visual impact assessment, and air quality study) must be adhered to by the holder of the authorisation.
- Should any heritage resources be exposed during the excavation for the purpose of construction, construction in the vicinity of the findings must be stopped. A registered heritage specialist must be called to the site for inspection. Under no circumstances shall any heritage material be destroyed or removed from the site. The relevant heritage resource agency must be informed about the finding.
- Avifauna, ecological and heritage specialists should be present during the planning and pegging of the final route alignment to ensure that the positions of pylons and construction camps result in minimum impacts on birds and sensitive landscape features (wetlands, rivers and granite outcrops).

General conditions

- A copy of this authorisation must be kept at the property where the activity will be undertaken. The authorisation must be produced to any authorised official of the Department who request to see it and must be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the property.
- Where any of the applicant's contact details change, including the name of the responsible person, the physical or postal address and/ or telephonic details, the applicant must notify the Department as soon as the new details become known to the applicant.
- The holder of the authorisation must notify the department, in writing and within 24 (twenty four) hours, if conditions of this authorisation are not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non compliance.
- Non-compliance with conditions of this authorisation may result in criminal prosecution or other action provided for in the National Environmental Management Act, 1998 and the regulations.
- All correspondence with regard to this project must be forwarded for the attention to the Director of Environmental Impact Evaluation within this Department.
- National government, provincial government, local authorities or committees appointed in terms of the conditions of this authorisation or any other public authorities shall not be held responsible for any damage or losses suffered by the applicant or his successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non compliance by the applicant with the conditions of authorisation as set out in this document or any other subsequent document emanating from these conditions of authorisation.

6. SUMMARY OF LAND OWNER DETAILS AND CONDITIONS

The successful completion of the project depends a lot on the good relations with the Landowner. It is therefore required that the Contractor will supply one person to be the liaison officer (CECO) for the entire contract, and that this person shall be available to investigate all problems arising on the work sites concerning the Landowners (TRMSCAAC1 REV 3).

All negotiations for any reason shall be between Eskom, the Landowner and the Contractor. **NO** verbal agreements shall be made. All agreements shall be recorded properly and all parties shall co-sign the documentation. It is proposed that a photographic record of access roads be kept. This will then be available should any claims be instituted by any Landowners. Any claims instituted by the Landowners shall be investigated and treated promptly. Unnecessary delays should be avoided at all costs.

The Landowners shall always be kept informed about any changes to the construction programme should they be involved. If the Environmental Control Officer is not on site the Contractor's Environmental Control Officer should keep the Landowners informed. The contact numbers of the Contractor's ECO officer and the Eskom ECO shall be made available to the Landowners. This will ensure open channels of communication and prompt response to queries and claims.

All contact with the Landowners shall be courteous at all times. The rights of the Landowners shall be respected at all times and all staff shall be sensitised to the effect that we are working on private property.

Eskom shall ensure that all agreements reached with the Landowner are fulfilled, and that such areas be rehabilitated once construction is completed. Should any claim be instituted against Eskom, due to the actions of the Contractor at a batching plant site, Eskom shall hold the Contractor fully responsible for the claim until such time that the Contractor can prove otherwise with the necessary documentation.

7.1. List of Landowners, Contact Details, Conditions and requirements.

Refer to Appendix N for the list of land owners supplied by Eskom Holding Limited.

7. COST ESTIMATE FOR IMPLEMENTATING THE MITIGATION MEASURES AND OPERATIONAL MAINTAINANCE THEREOF.

(This section is to be completed by the relevant contractor/s prior to ground breaking).

8.1 Environmental Cost Estimates during construction phase

Construction phase Cost Estimates				
Categories and activities	Explanations	Examples	Operational costs	Capital costs
Environmental costs associated with the Transmission network	Environmental impact quantification costs associated with the compilation of scoping documents, EIA's, EMP's, risk assessments and the compilation, implementation of EMP's, and EMP's for new or existing projects EXCLUDING internal man-hours. This would include costs associated with contractors employed to undertake EIA's and EMP's.	Environmental impact quantification costs associated with the compilation of scoping documents, EIA and EMP reports. Costs associated with EIA, EMP reports and power line modifications due to environmental reasons.		
Drainage	Costs associated with the construction of, modifications too, repair and maintenance of all sewerage drainage systems			
Fire protection –	Costs associated with the modifications of, repair and maintenance too all transformer bund walls			
	Costs associated with modifications of, repair and maintenance too all substation oil dams			
Water treatment	Costs associated with the,repair and maintenance of all substation water pipes and associated water			

	infrastructure			
Animal interaction.	Costs associated with the installation of bird diverters			
Rehabilitation	All costs associated with the rehabilitation of disturbed land			
Internal Man-hours	Environmental Cost Centres for dedicated full time Environmental Personnel. This includes man-hours and other costs incurred that are charged to the cost centre by non dedicated environmental personnel	Costs associated with actual time spent on managing, documenting, monitoring, reviewing and mitigating environmentally related impacts (air, water, waste, land) Environmental costs associated with capital projects are capitalised (i.e. charged to one of the categories under capital expenditure) and hence are not to be included as part of the costs assigned to the environmental cost centre. Only the supply amount must be used at all times to remove the risk for double accounting.		
Categories and activities	Explanations	Examples	Operational costs	Capital costs
Audits	All costs associated with environmental audits			
<ul style="list-style-type: none"> • Internal audits. • External audits 				
Training (internal and	Costs associated with environmental training, for courses attended internally and externally, including environmental related interventions for	Costs associated with environmental training, only for EDCO registered courses attended internally and		

<p>external)</p>	<p>non environmental practitioners who are required to incorporate environmental considerations in the performance of their duties</p>	<p>externally by non environmental practitioners who are required to incorporate environmental considerations in the performance of their duties. EDCO registered environmental related courses, which support the Transmission Group's business goals and Key Performance Areas. Other adhoc courses, seminars and conferences, which are not registered on the EDCO system, will not be reported on.</p>		
<p>Waste management Costs associated with the management of domestic and hazardous waste as per the waste directive.</p>	<p>Costs associated with the repair and maintenance of all sewerage pipes. Costs associated with all sewerage removal contracts</p>			
	<p>PCB:</p> <ul style="list-style-type: none"> • Costs associated with the removal, storage and disposal of all hazardous waste • Costs associated with the incineration of PCB's 			
	<p>Costs associated with the removal of domestic waste at Transmission business units and substations.</p>			

	Costs associated with the replacement and removal of asbestos slabs			
Categories and activities	Explanations	Examples	Operational costs	Capital costs
Land management Biodiversity and land management. Costs related to managing and maintaining servitudes and land including erosion control, firebreaks, alien plant eradication and animal interactions. All costs related to grass cutting shall not be included.	Costs associated with all erosion contracts initiated for the sole purpose of rectifying damage to the environment.			
	Rehabilitation: Costs associated with the rehabilitation of disturbed land during construction.			
	Aesthetics: Costs associated with modifications for aesthetic reasons.			
	Costs associated with the eradication of Alien / invader vegetation.			

	Projects initiated in the supply plan and fulfilling the criteria of environmental expenditure as per the definitions			
Pollution	All costs associated with the clean up and mitigation of oil, herbicide or hazardous substance spills.			
Production equipment	All assets purchased for the primary reason of sustaining, improving, rectifying damage too or protecting the environment from real or perceived impact			
Other	Other environmental costs costed for the sole purpose of sustaining, improving, rectifying damage too or protecting the environment from real or perceived impact			
TOTALS				

8.2 Environmental Cost Estimates during operational phase

Operational Phase Cost Estimates				
Categories and activities	Explanations	Examples	Operational costs	Capital costs
Environmental costs associated with the Transmission	Environmental impact quantification costs associated with the compilation of scoping documents, EIA's, EMP's, risk assessments and the compilation, implementation of EMP's, and	Environmental impact quantification costs associated with the compilation of scoping documents, EIA and EMP reports.		

network	EMP's for new or existing projects EXCLUDING internal man-hours. This would include costs associated with contractors employed to undertake EIA's and EMP's.	Costs associated with EIA, EMP reports and power line modifications due to environmental reasons.		
Drainage	Costs associated with the construction of, modifications too, repair and maintenance of all sewerage drainage systems			
Fire protection –	Costs associated with the modifications of, repair and maintenance too all transformer bund walls			
	Costs associated with modifications of, repair and maintenance too all substation oil dams			
Water treatment	Costs associated with the repair and maintenance of all substation water pipes and associated water infrastructure			
Animal interaction.	Costs associated with the installation of bird diverters			
Rehabilitation	All costs associated with the rehabilitation of disturbed land			
Internal Man-hours	Environmental Cost Centres for dedicated full time Environmental Personnel. This includes man-hours and other costs incurred that are charged to the cost centre by non dedicated environmental personnel	Costs associated with actual time spent on managing, documenting, monitoring, reviewing and mitigating environmentally related impacts (air, water, waste, land) Environmental costs associated with capital projects are capitalised (i.e. charged to one of the categories under capital expenditure) and hence are not to be included as part of the costs assigned to the environmental cost centre. Only the supply amount must be		

Categories and activities	Explanations	Examples	Operational costs	Capital costs
<p>Audits</p> <ul style="list-style-type: none"> • Internal audits. • External audits 	<p>All costs associated with environmental audits</p>	<p>used at all times to remove the risk for double accounting.</p>		
<p>Training (internal and external)</p>	<p>Costs associated with environmental training, for courses attended internally and externally, including environmental related interventions for <u>non environmental practitioners</u> who are required to incorporate environmental considerations in the performance of their duties</p>	<p>Costs associated with environmental training, only for EDCO registered courses attended internally and externally by non environmental practitioners who are required to incorporate environmental considerations in the performance of their duties. EDCO registered environmental related courses, which support the Transmission Group's business goals and Key Performance Areas. Other adhoc courses, seminars and conferences, which are not registered on the EDCO system, will not be reported on.</p>		
<p>Waste management Costs associated with the management of domestic and hazardous waste as per the waste</p>	<p>Costs associated with the repair and maintenance of all sewerage pipes. Costs associated with all sewerage removal contracts</p>			

directive.				
	<p>PCB:</p> <ul style="list-style-type: none"> • Costs associated with the removal, storage and disposal of all hazardous waste • Costs associated with the incineration of PCB's 			
	Costs associated with the removal of domestic waste at Transmission business units and substations.			
	Costs associated with the replacement and removal of asbestos slabs			
Categories and activities	Explanations	Examples	Operational costs	Capital costs
<p>Land management Biodiversity and land management. Costs related to managing and maintaining servitudes and land including erosion control, firebreaks, alien plant eradication and</p>	<p>Costs associated with all erosion contracts initiated for the sole purpose of rectifying damage to the environment.</p>			

animal interactions. All costs related to grass cutting shall not be included.				
	Rehabilitation: Costs associated with the rehabilitation of disturbed land during construction.			
	Aesthetics: Costs associated with modifications for aesthetic reasons.			
	Costs associated with the eradication of Alien / invader vegetation.			
	Projects initiated in the supply plan and fulfilling the criteria of environmental expenditure as per the definitions			
Pollution	All costs associated with the clean up and mitigation of oil, herbicide or hazardous substance spills.			
Production equipment	All assets purchased for the primary reason of sustaining, improving, rectifying damage too or protecting the environment from real or perceived impact			
Other	Other environmental costs costed for the sole purpose of sustaining, improving, rectifying damage too or protecting the environment from real or perceived impact			
TOTALS				

8. GENERAL

9.1. Physical Access Plan

The Contractor (CECO), in conjunction with the ECO and Landowners, shall draft a physical access plan. No decisions shall be made without the consent of the Landowner. All agreements should be in writing and well documented.

The physical access plan shall allow for the installation of concrete pipes and drifts where such structures may be needed to facilitate access. The Environmental Control Officer in conjunction with the Contract Manager shall use discretion as to what special measures will be required to ensure access. The necessary agreements reached shall be implemented to the satisfaction of the landowner.

9.2. Awareness and Training of Contractor

The ECO, with the assistance of the Contractor, shall communicate all aspects of the EMP to the site staff (i.e. site agents to labourers) prior to commencement of any environmentally disturbing activity. Basic environmental awareness training must be carried out for all employees and should be included in safety training. In addition awareness posters should be placed in various sections of the construction camps and notice boards. Toolbox talks should be undertaken at least once a week and/or before each new activity. This training must include procedures for relocating sensitive fauna from the site. A copy of the EMP must always be made available on site.

9.3. Site Documentation/ Monitoring

The standard Eskom site documentation shall be used to keep records on site. All documents shall be kept on site and be available for monitoring and auditing purposes. Site inspections by an Environmental Audit Team may require access to this documentation for auditing purposes. The documentation shall be signed by all parties to ensure that such documents are legitimate. Regular monitoring of all site works by the Environmental Control Officer is imperative to ensure that all problems encountered are solved punctually and amicably. When the Environmental Control Officer is not available, the Contract Manager/Site Supervisor shall keep abreast of all works to ensure no problems arise.

Two-weekly reports shall be forwarded to the appointed Transmission Environmental Advisor with all information relating to environmental matters.

The following **Key Performance Indicators** must be reported on a two-weekly basis:

- Complaints received from Landowners and actions taken.
- Environmental incidents, such as oil spills, concrete spills, etc. and actions taken (litigation excluded).
- Incidents possibly leading to litigation and legal contraventions.
- Environmental damage that needs rehabilitation measures to be taken.

The following documentation shall be kept on site:

- Access negotiations and physical access plan.
- Complaints register.
- Site daily diary.
- Records of all remediation / rehabilitation activities.
- Copies of two-weekly reports to the Tx Engineering Environmental Advisor at MWP.
- Copy of the Environmental Management Programme (EMP) file.

9.4. Audits

During the construction period Environmental Audits shall be conducted to determine compliance with the recommendations of the EIA, EMP and conditions of the Record of Decision (ROD). These can be internal audits or external by DEA or the ISO14001 auditors or combined audits.

9.4.1. Proposed Audit Programme

The appointed ECO, as well as the contractors on site, are responsible for ensuring compliance with the EMP. It is recommended that periodic EMP compliance reports (audits) are compiled by the ECO and submitted to the Eskom Environmental Advisor for review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance which is not correctly rectified to the DEA.

Interested and Affected Parties (Landowners) must be allowed access to the EMP document should they so wish. They have the right to monitor specific aspects of the EMP in conjunction with the ECO and Contractor in a reasonable and informal manner, without unreasonably disrupting construction activities.

9.4.2. Audit Reporting

The Contractor shall keep a record of all complaints received from the community and communicate them to the ECO. These complaints must be addressed and mitigated, within reason. Records relating to the compliance/non-compliance with the conditions of the EMP as well as audits reports shall be kept in good order and shall be made available to DEA within seven days after a written request has been received. It is suggested that all records be kept for at least two years following construction activities for reference purposes.

9. CONCLUSION

This construction and operational EMP has been prepared for the Tabor - Witkop 400kV Transmission Power Line. This EMP is relevant and specific to the site between Tabor substation and Witkop. Based on the site visit and assessment made by the specialists and EIMS most of the power line towers are positioned in areas that are transformed by cultivation and rural settlement or are in natural vegetation that is not considered to be especially sensitive. During the site walk down no red data plant or animal species were observed even though previous studies undertaken shows that some of the red data species exist. A number of heritage features were identified along the proposed route as well during the site walk through.

Proper mitigation measures have been proposed by both specialist (Avifauna, Ecology and Heritage, please refer to Appendix F) in order to reduce the impacts of the proposed power line on the surrounding.

10. REFERENCES

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- Conservation of Agricultural Resources Act, Act 43 of 1983 and amendments.
- Corporate directive for the management of PCB, ESKADAAO3 REV 1.
- Environmental Impact Report of the Project.
- Eskom Guidelines for Herbicide Use, TRR/S91/032.
- Environment Conservation Act, Act 73 of 1989 and amendments.
- Fencing Act, Act 31 of 1963 and amendments.
- Hazardous Substances Act, 15 of 1973 and amendments.
- Health Act, Act 63 of 1977.
- Herbicide Management, ESKPBAAD4 REV 0.
- Minerals Act, Act 50 of 1991.
- National Environmental Management Act, Act 107 of 1998 and amendments.
- National Forest Act, Act 84 of 1998.
- National Heritage Resources Act, Act 25 of 1999.
- National Water Act, Act 36 of 1998.
- Standard passive fire protection for oil-filled equipment in High Voltage yards, TRMASAAQ8 REV 4
- Standard for management of PCB, ESKASAAC2 REV1.
- Occupational Health and Safety Act, Act 85 of 1993
- DEAR Record of Decision and conditions.
- Vegetation Management Guideline.