TRANSMISSION SERVICES

DRAFT ENVIRONMENTAL MANAGEMENT PLAN

PROJECT NAME :
DATE :

ESKOM ENVIRONMENTAL ADVISOR:
TEL:

ENVIRONMENTAL ASSESSMENT PRACTIONER:
NAME:
TEL:

TABLE OF CONTENTS

LIST OF ANNEXURES

1. INTRODUCTION

The construction and refurbishment of Transmission lines can have a major impact on the environment. It is thus imperative that better 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.

The scope of this document is to give environmental management plan, to the Contractor constructing the transmission line, in fulfilment of ISO 14001 requirements. This document is part of the 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 through out the project,
- All Landowner special conditions are identified and taken into consideration as the 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. PROJECT SCOPE OF WORKS

1.2. BACKGROUND INFORMATION

1.2.1. Project Execution area

The execution area is limited to the area as demarcated by Eskom and shown on the locality plan (annexed….) and site plans (annexed…). 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 Bushclearing 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.

1.2.2. TECHNICAL SPECIFICATION

1.2.2.1. LENGTH:

The length of the line will be approximately _____km.

1.2.2.2. CONSTRUCTION AREA:

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

1.2.2.3. TOWER PARAMETERS:

- Tower spacing : _____m. (Average)
- Tower height : _____m. (Average)
- 1.3.3.3. Conductor attachment height : _____m. Average)
- 1.3.3.4. Conductor type ` : _____.
- 1.3.3.5 Minimum ground clearance : _____m.

1.2.2.4. TOWER DESIGN:

The following types of towers are used on this project:

(Update list as per project requirements)

Types of Towers	Y/N
Cross rope suspension tower.	
Compact cross rope suspension tower.	
Guyed-V suspension tower.	
Self-supporting suspension tower.	
Self-supporting strain tower.	

(Provide Photo of the tower)

1.2.2.5. MAJOR ACTIVITIES OF THE PROJECT

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

ACTIVITIES	PROPOSED PROGRAMME	
	START	FINISH
• Environmental Impact Assessment – Refer to annexure "E" for a Copy of Record of Decision (ROD).		
• Negotiations for the servitude –Landowners, their contact details and their special conditions are listed under section 5 of this document .		
• Land survey to determine the exact routing of the line and tower placement.		
• Pegging of bend tower by a Transmission surveyor.		
• Profiling work to produce the profiles for construction (refer to annexure "C").		
• Establishment of camp sites for the Contractors' workforce. An approved (by the relevant Government authorities) site Camp EMP will be used to guide the establishment of the camp site		
• 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 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 line from the contractor for commissioning.		
• Final inspection of the line, commissioning and hand over to the Grid Line 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 line by the Grid.		

The final inspection for the release of the Contractors' guarantee takes place a year after completion of the project. The 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 and Tourism	DEAT
Department of Water Affairs	DWAF
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.	MPRDA

28 of 2002)	
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 Guidline	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
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 Line Towers and 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

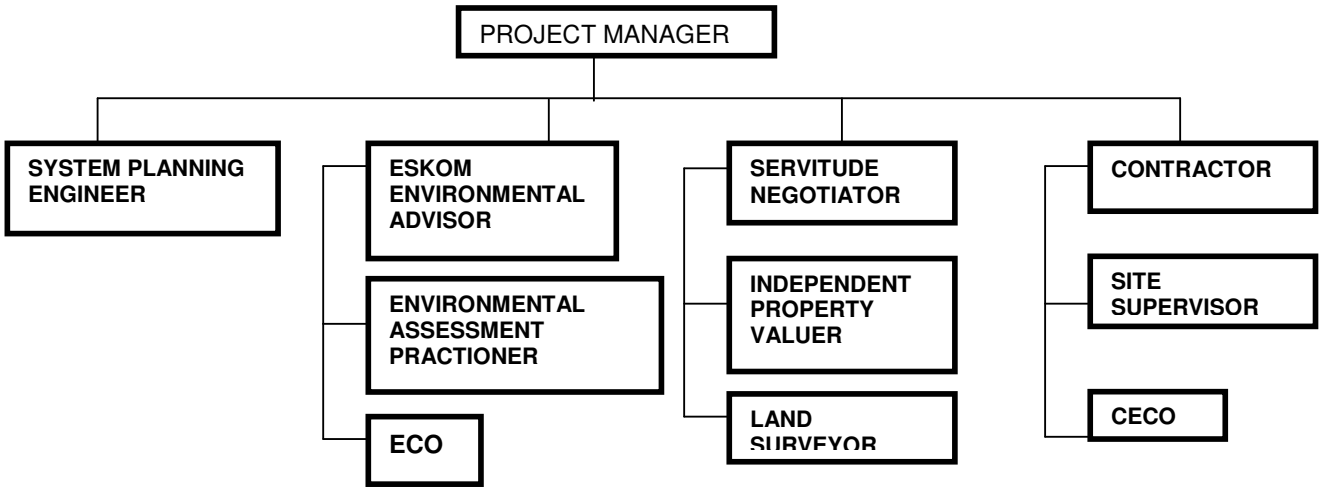
3. Project team

Profession/Role	Name	Contact Details	Remarks
System Planning Engineer			
Eskom Environmental Advisor			
Servitude Negotiator			
Project Manager (PM)			
Site Manager			
ECO			
Contractor			
CECO (Dedicated person			

appointed by the contractor)			
Grids Environmental Practitioner			
Grid Line & Servitude Manager			
Environmental Assessment Practitioner			
Authorising Department			

This should also outline the responsible parties and reporting procedures- including progress reporting.

3.1. REPORTING STRUCTURE.



3.2. ROLES AND RESPONSIBILITIES OF THE PROJECT TEAM

3.2.1 System Planning Engineer

3.2.2 Eskom Environmental Advisor (during feasibility stages & construction phases)

- To ensure that an un-biased, EIA with a thorough public participation is conducted for the proposed project. Such assessment to be in accordance to the latest legislation and acceptable to all interested and affected parties and to finally be approved by the relevant authority.

- To secure an uncontested Record of Decision.
- To project manage the Independent Environmental Consultants through out the EIA life cycle and to ensure that a friendly, practical, EMP for the construction phase of a project is compiled and approved by the relevant and appropriate government authorities.
- To ensure that all conditions as stipulated in the ROD are met.
- To conduct spot audit during construction.

3.2.3 Servitude Negotiator

- To select a route where Tx powerline will transverse, within the environmentally prescribed corridor.
- To negotiate servitude on private and public owned properties.
- To identify landowner conditions & requirements

3.2.4 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 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.

3.2.5 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 is a requirement of ISO 14001 and shall be done with all main and sub-contractors. Record of the training date, people whom attended and discussion points shall be kept by the ECO.

The Environmental Control Officer shall make contact with the local Extension Officer of the Dept. of Agriculture and the Chairpersons of the Farmers Associations where the route traverses, 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.

The contact numbers of the ECO and CECO shall be made available to Landowners.

ECO officer will report progress made on a monthly basis to the PM 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.

3.2.6 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
- 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.
- 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.

3.2.7 Eskom Environmental Advisor (During Operational Stage)

- To implement and integrate environmental management systems by ensuring compliance to ISO 14000 & monitoring performance
- Report environmental incidents
- Provides environmental training
- Ensures compliance to legislations and other legally binding documents

3.2.8 Environmental Assessment Practioners

- Investigate and produce assessment of impacts on the environment related to the project
- Ensure the implementation of a thorough public participation process
- Draft and submit scoping and EIR to relevant Government Departments

- Draft EMP and submit for approval to the relevant Government Departments.

3.2.9 Authorising Department.

To provide ROD on all applications lodged for the proposed Transmission lines, substations and related activities.

4 ENVISAGED ACTIVITY SCHEDULE AND ASSOCIATED IMPACTS

- ***Lists predicted negative environmental impacts for which mitigation is required***
- ***Description of mitigation measures. These should be described in detail and should be accompanied by designs, equipment description and operating procedures.***
- Description of implementation of the mitigation ,measures.

Implementation Schedule:

Description of monitoring programme: Describes the implementation programme and monitoring system.

Use of KPI, measuring methods, and threshold that will signal the need for corrective actions.

All Environmentally sensitive areas are indicated on the profiles and the Project Manager and Contractor shall take note of these. **The Contractor (TRMSCAAC1 REV 3 section 4.1.2) shall take all the necessary precautions against damage.**

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								
1.1 Set up living quarters, site office, assembly area and workshops	• 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	• Damage to protected / endangered vegetation • Damage to topsoil / waste concrete • Compacting of ground • Employment and skills development	NEMA BDA CARA LRA SDA	**Objective**: • 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 • 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 **Mechanisms:** • Site establishment shall take place in an orderly manner and all amenities shall be installed at Camp sites before the main workforce move onto site. • The Contractor camp shall have the necessary ablution facilities with chemical toilets where such facilities are not available at commencement of construction. • The Contractor shall supply a	• 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 along the servitude one year after completion of the	Report on all NCRs identified Perform Spot Audits regularly Conduct final audit before site handover to the asset owner		ECO Eskom Envir. Practitioner / Advisor Eskom Envir. Practitioner / Advisor

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
				wastewater management system that will comply with legal requirements and be acceptable to Eskom. • Location of construction camp will be negotiated with the affected landowner prior to occupation. • Camp site will be fenced off and kept locked at all times • Compacted ground shall be rehabilitated by ripping to a minimum depth of 600mm	contract due to incorrect herbicide use			
1.3 Use of ablution facilities and kitchen facilities	Install drainage system for toilets, waste water, water supply	Ground water pollution and impact on vegetation Pollution of ground water and soil	NWA OHSA NEMA TRMSCAAC1 REV 3	**Objective:** To ensure proper sanitation is achieved and minimise the spread of diseases **Machanism:** • 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 • The Contractor shall take all the necessary precautions against the spreading of disease, especially under livestock.	No complaints received from landowners regarding sanitation	A record shall be kept of drugs administered and the dates when this was done. This should be available on site. A record of all complaints should be available on request. ECO officer to keep records		
	Use veld for toilet	Health risk / spreading of diseases	OHSA					

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
1.4 Set up batching plant	Negotiate the site for batching plant.	Damage to top soil	TRMSCAAC1 REV 3	**objective**: • To ensure all agreements with Landowners are adhered to • Prevention of complaints from Landowners • Successful rehabilitation of disturbed areas **Mechanisms:** The siting of batching plants shall be done in conjunction with the landowner and ecologist/botanist and archaeologist • The batching plant area shall be operated in such a way as to prevent contaminated water to run off the site and polluting nearby streams or water bodies. To this effect diversion berms can be installed to direct all wastewater to a catchment area.	• No Complaints from Land Owners • All disturbed areas to be rehabilitated successfully, three months after construction	Landowner to sign off after completion of project.		

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 Set up store area	• Install fencing & Digging holes, • Insert Poles & concrete, Erect fence, grading and clearing the area • Create fire breaks • Storage of hazardous Substances	• Disturbance of topsoil • Waste concrete • Damage to protected / endangered vegetation • Wire offcuts • Fire risks Spillages	CARA NEMA ECA BDA HSA FA TRMSCAAC1 REV 3	**Objectives:** • **To prevent fire breakout** • **To prevent soil pollution** **Mechanisms**: • Fencing in of the storage areas for drums on site is also proposed, as this will keep out animals and prevent injury. Should the Contractor want to leave guards on site, this should be discussed and negotiated with the Landowner. Proper facilities must be provided to ensure sanitation standards are met. • Mobile chemical toilets shall be installed at such sites where a large number of the workforce is concentrated. • The contractor is referred to FA. • All gates installed in electrified fencing shall be re-electrified. All gate positions shall be three (3) metres off centre to allow for continued access when stringing takes place • All storage tanks to be protected underneath by a plastic sheeting and trench or bund wall around them to avoid ground pollution • Contractor to remove all polluted soil to an approved toxic site or to be treated chemically. • All spills to be cleaned and rehabilitated immediately • All hazardous substances shall be stored in suitable containers	• 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. • All spills to be cleaned and rehabilitated immediately • 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 contained, cleaned and rehabilitated immediately	• The Environmental Control Officer shall approve gate positions. • ECO to report NCRs • Regular monitoring and recording of spills on the register Monitor register	Monthly Monthly	ECO ECO 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 storage areas shall be bunded. This includes all carbon substances like fuel and oil as well as herbicides and battery acid. • Areas shall be monitored for spills and any spills shall be contained, cleaned and rehabilitated immediately. • Any leaking containers shall be repaired or removed from site.				
1.6 Set Up Batching plant	Dust and Noise Management during site establishment	Dust nuisance from the excavated and stockpiled material		**Objectives**: To avoid dust nuisance from excavated material And avoid noise nuisance from operating construction equipment **Mechanism**: • 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 equipments				

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 Use of vehicles for material, equipment and personnel transportation	• 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	• Oil, lubricants or fuel spills • Waste material containers / packaging	• NWA • ECA • NEMA • HSA	**Objectives**: To prevent and minimise pollution to the environment. Prevent transgressing acts that governs pollution **Mechanisms**: • 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 shall 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 shall be monitored for oil and fuel spills and such spills shall 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 and available at all times on site, • All hazardous substances shall	• No oil 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 rehabilitated immediately	Monitor register	Daily	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
				be stored in suitable containers and storage areas shall be bunded. This includes all carbon substances like fuel and oil as well as herbicides and battery acid.. • Any leaking containers shall be repaired or removed from site (See above actions for spills).				
1.8 Tower Pegging	Vehicle driving in veld	• Damage to protected / endangered vegetation • Damage to heritage sites • Oil Spills	BDA NHRA NWA CARA	**Objective**: To minimise environmental impact **Mechanisms**: Re-seeding shall be done on disturbed areas as directed by the Environmental Control Officer. In accordance with the Conservation of 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 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.				
	Surveyor pegging towers	Littering of packaging & pegging materials	NEMA ECA	Refer to littering under site establishment.				

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
1.9 Bush clearing	• People cutting vegetation by hand • Bulldozer clearing vegetation	• Damage to protected / endangered vegetation • Disturbance of topsoil Damage to heritage sites	BDA NHRA	**Objectives**: • 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 **Mechanisms**: • Protected or endangered species of plants shall not be removed unless they are interfering with a structure. • Where such species have to be removed due to interference with a structure, 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 if required. • No vegetation clearing in the form of de-stumping, scalping or uprooting shall be allowed on river- and stream banks. Vegetation shall only be cut to allow for the passage of the	• 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 • 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			

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
				pilot-cables and headboard. **Contractor requirements:** • Contractor must be in possession of a valid herbicide applicators licence • Contractor to have necessary knowledge to identify protected species as well as species not interfering with operation of the line due to their height and growth rate • Contractor to be able to identify all declared weeds & alien species that can be totally eradicated.				
	• Clearing of vegetation on river banks • Excessive clearing of servitude	Erosion and invader plants Damage to protected / endangered vegetation	CARA BDA NWA	**Objectives:** • 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 • Minimise erosion damage on donga crossings • Minimise impeding the natural flow of water **Mechanisms:** No vegetation clearing shall be allowed across ravines and gullies,	• No interference to dongas embarkment • No erosion visible to donga embankment due to construction activities • No interference with natural flow of water • No disturbance to donga embankments • No erosion visible on donga embankments due to construction activities • No interference with the natural flow of water • 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
				as this vegetation will very rarely interfere with the clearance to the strung conductor				
1.10 Gate installation	• Flattening of fences to gain access • Tying off fence and straining fence wires	• Damage to fences • Damage to electrical fencing • Wire off cuts and broken fences	FA TRMPVACV2 REV1 TRMSCAAC1 REV 3	**Objectives:** • 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 **Mechanisms:** • 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	• 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			

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
				marked by painting the posts green. • All claims arising from gates left open shall be investigated and settled in full by the Contractor. • 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	**Mechanisms**: • At any gate poles where conventional foundations are installed, the Contractor shall remove the topsoil separately and store it for later use during rehabilitation. • 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				

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
	• Insert gate and pour concrete • Installation of concrete sill in Vermin proof fence	Waste concrete	NEMA ECA	**Objective:** **Mechanisms:** • 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 •				
2. ACCESS ROADS CONSTRUCTION								
	• Mark access roads • Vehicles driving off servitude road • Illegal use of private roads	• Damage to protected / endangered vegetation • Damage to drifts and bridges & irrigation lines	BDA	**Objectives:** • Minimise damage to river and stream embankments • Minimise erosion of embankments and subsequent siltation of rivers, streams and dams **Mechanisms:** • 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	• Access plan approved by ECO • All access roads will be marked • No complaints from residents and landowners • No access roads through river and stream banks • No visible erosion scars on embankments once construction is completed			

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
				necessary to ensure access to all tower sites. • All access roads will be marked • Agreed on Access to be used at all times. • 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				

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
				Environmental Control Officer. • All structures constructed for access purposes shall be properly designed and drawings of such structures shall be available for record purposes. • Permanently wet areas are shown on the profiles. No vehicular traffic shall be allowed in such 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.				
	Bulldozer blading access roads	• Damage to protected / endangered vegetation • Damage to heritage sites, Damage to private roads	BDA NHRA	**Objectives:** **Mechanisms:** • 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 line.				

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
				• 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 a structure. • Where such species have to be removed due to interference with a structure, the necessary permission and permits shall be obtained from Provincial Nature Conservation				
	Blading of access roads through dongas	Causing erodable areas, Erosion and loss of topsoil	CARA	• 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.	• 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			

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
					• No litigation due to unauthorised removal of vegetation			
	Construction of drifts / donga crossings	Erosion / impedance of water flow	NWA					
	Road construction on slopes	Erosion and loss of topsoil	CARA					
	Installation of diversion berms	Prevention of erosion	NWA CARA					
3. TOWER CONSTRUCTION								
	Excavation of foundation	Disturbance of topsoil and vegetation Loss of topsoil with seedbank	CARA TRMSCAAC1 REV 3	**Objectives:** **Mechanisms:** 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				

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
				Contractor shall take care not to dump the topsoil in the bottom of the foundation and then put spoil on top of that • 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.				
		Damage to heritage sites	NHRA					
	Drilling of foundation	Noise and dust pollution	NEMA ECA	**Objectives**: To avoid dust nuisance from excavated material And avoid noise nuisance from operating construction equipment **Mechanism**: • 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				

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
	Installation of steel reinforcing	Waste material	NEMA ECA	**Objectives:** **Mechanisms:** • 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 shall be picked up and removed from site.				
	• Casting of concrete & washing of concrete truck on site	Waste concrete	NEMA ECA	**Objectives**: **Mechanisms:** • 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 • Surplus concrete may not be dumped indiscriminately on site, but shall be disposed of in designated areas as agreed by the 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
	• Assembling of towers • Dressing of towers with hardware and insulators	• Waste bolts and nuts • Insulator breakage littering glass shards in veld	NEMA ECA	**Objectives:** **Mechanisms:** • 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 shall be picked up and removed from site.				
	Punching and painting of nuts	Paint spillages	NWA	Rehabilitation of soil				
	Erection of towers with crane	Trucks / crane breaking and spilling oil / lubricants Fuel spillages during re-fuelling	NWA	How to rehabilitate oil and prevention				
	Erection of towers with helicopter	Noise and dust pollution	NEMA ECA	**Objectives**: To avoid dust nuisance from excavated material And avoid noise nuisance from operating construction equipment **Mechanism**: • Implement dust suppression measures e.g. regular watering • Develop and implement dust monitoring programme • Limit working hours of noisy				

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
				equipment to daylight hours • Fit silencers to equipments				
	Discarding packaging material on site	Waste material littering in veld	NEMA					
4. STRINGING OPERATIONS								
	Installation of phase and earth conductors	Damage to structures and agricultural crops	TRMSCAAC1 REV 3	**Objective:** • Prevent damage to expensive structures and crops, • Prevent disruption of services **Mechanisms:** • 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 lines are sufficient.	• No claims emanating from damage to supporting structures and crops • No complaints or claims arising from disruption of services			

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
	• Clearing of drum, tensioner and whinch stations • Creating fire breaks around drum stations	Damage to protected / endangered vegetation	BDA	**Objectives:** • Minimise damage to vegetation • Minimise damage to topsoil • Successful rehabilitation of barren areas **Mechanisms:** • 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.	• No damage to vegetation outside the servitude • No visible erosion three months after completion of the contract • No loss of topsoil			
	Using bulldozer for tension purposes	Damage to heritage sites, Disturbance of topsoil and	NHRA BDA	**Objectives:** • Protection of archaeological sites and land considered to be of cultural value	• No destruction of or damage to known archaeological sites • Management of existing			

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
		vegetation	CARA	• 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 **Mechanisms:** • 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. • Permits shall be obtained from the South African Heritage Resources Association (SAHRA) should the proposed line affect any world heritage sites or if any sites are to be destroyed or altered.	sites and new discoveries in accordance with the recommendations of the Archaeologists • No litigation due to destruction of sites			

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
				• No dolomite, breccia or stomatolites 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.				
	• Jointing and crimping of conductors • Discarding wooden cable drum material on site	Waste material littering in veld	NEMA ECA	**Objective**: **Mechanisms:** 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.	No waste material shall be left on site that may harm man or animals.			
	No protection for fences during stringing	Damage to fences	FA	**Objectives:** No damage to fences **Mechanisms:** • All fences shall be protected against damage during stringing operations. • All damage to be repaired immediately and to the satisfaction of the 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
	Tractor pulling out pilot wire	Damage to protected / endangered vegetation	BDA					
5. REHABILITATION OF SERVITUDE								
	Installation of diversion berms	Prevention of erosion	CARA					
	Fixing of fences	Waste material littering in veld	NEMA ECA					
	Re-seeding of barren areas	Wrong seed used	BDA FA TRMSCAAC1 REV 3	**Objective** • Minimise damage to topsoil and environment at tower positions Successful rehabilitation of all damaged areas Prevention of erosion **Mechanisms:** • 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	• 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			

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
				according to the slope on tower sites. • The type of soil shall also be taken into consideration. • A mixture of seed can be used provided the mixture is carefully selected to ensure the following: o Annual and perennial plants are chosen o Pioneer species are included o All the plants shall not be edible o Species chosen will grow in the area without many problems. o Root systems must have a binding effect on the soil. o 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 in of badly damaged areas, will always be at the discretion of				

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 ECO, unless specifically requested by a Landowner (Specifics about the project, special tower positions, helicopter construction, etc.)				
	Picking up all rubble and litter	Servitude left clean and neat	NEMA ECA HSA	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.				
	• Settling of all outstanding claims • Signing off	Landowners happy Servitude ready for handover to Grid		**Objectives:** Minimize claims and litigation from landowners **Mechanisms:**	• Successful completion of the contract with all landowners signing the release form six months after completion of the			

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
	all landowners			• All anticipated crop damage shall be noted while access negotiations are underway. • All damage to commercial crops shall be recorded immediately. • The ECO • 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.	project • All claims investigated and dealt with in one month • No litigation due to unsettled claims			
Fire control	Making fires in winter due to cold weather Cooking food on site / smoking	Veld fires	NVFFA FA	**Objective:** **Prevention of veld fires** **Mechanisms** • 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, especially during the winter months.	No reported fire incidents	Daily physical checks		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
Use veld for toilet		Health risk / spreading of measles	OHSA TRMSCAAC1 REV 3	• 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 line traverses land where stock (cattle and sheep) and game farming is practised.				
		Unauthorised access		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				
Transportation of personnel and material to site		Trucks breaking and spilling oil	NWA ECA HSA	See 1.7 above				
5. WASTE MANAGEMENT								

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
	• Erect temporary houses and tents, • Erect store for oil, lubricants and parts • Install waste collection bins	Waste material / littering Waste foodstuff and food containers	NEMA TRMSCAAC1 REV 3	**Objective**: • 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**: • No material shall be left on site that may harm man or animals. • Littering by the employees of the Contractor shall not be allowed • 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 on site unless burned off-site in a registered facility.	• 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	• 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 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
1. Landowner relations				**Objectives**: Maintain good relations with Landowners **Mechanisms:**	• No delays in the project due to Landowner interference • No Claims or litigations from landowner • Landowner signs final release form			
2. Interaction of staff	Staff acivities	• Job creation • General incidents		**Objective:** • **Wherever possible local labour should be used.** • **Avoid interactions between farm labourers and construction 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
Maintenance	Removal of alien vegetation Access Roads- what is the activity Bush and reeds Clearing Clearing of alien and invasive species Grass Cutting Disposal of cut material Wild Life Interaction , cattle, game, birds, protected	Hardware Servitude Erosion Line faults Breeding of raptors and stocks disturbed (if any) Collision of birds with overhead lines	TRMAGAAZ3	Objective: Prevent bird electrocutions Objective: Prevet collision of birds with overhead lines Mitigation: Use bird flight diverters and bird flappers				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
	species Herbicides							
	Waste							
Projects	Grass Cutting							
	Bush Clearing							
Line Patrol	Foot Patrols							
	Vehicle Patrol							
	Helicopter Patrol							
Rehabilitation Building development	Servitude rehabilitation Hardware Rehabilitation Farm dwelling Rural dev Urban dev Industrial dev							
Land								

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
Owner Interaction								
Control of illegal encroachment on the servitude		Electrocution		Regular patrols by Eskom Staff				Eskom grid staff
Agricultural Activities	Forestry							
	Maize/ Beans							
	Cane							
	Grazing							
	Citrus/Nuts/ Fruits							
Fire Management	Vineyards Game Farm							
Aviation activity		Collision with aircrafts		Objective: Prevent collision with aircrafts Mitigation: Use aircraft warning spheres across deep valleys in forested areas				Eskom grid staff
Archaeological sites			SAHRA	Objective: Prevent destruction of these sites Mitigation: Mark these sites clearly and make				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
		Damage or destruction of these sites		staff aware of their location, characteristic and significance				

4. OUTLINE OF ROD CONDITIONS

5 SUMMARY OF LAND OWNER DETAILS & 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.

5.1. LIST OF LANDOWNERS, CONTACT DETAILS, CONDITIONS AND REQUIREMENTS.

PORTION NO	NAME OF LAND OWNER	LAND OWNER CONTACT DETAILS	LAND OWNER CONDITIONS	TOWERS AFFECTED	CO-ORDINATES	ENVIRONEMTAL IMPACTS ANTICIPATED TOWERS	REFERENCE TO PROFILES & DRAWINGS
1. Portion 5 of farm …. JR	Mr. Peit Botha	082 395 678					

6 COST ESTIMATES FOR IMPLEMENTING THE MITIGATION MEASURES AND OPERATIONAL MAINTENANCE THEREOF (EXAMPLE).

6.1. 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 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 • Internal audits. • External audits	All costs associated with environmental audits			
Training **(internal and external)**	Costs associated with environmental training, for courses attended internally and externally, including environmental related interventions for non environmental practitioners who are required to incorporate environmental considerations in the	Costs associated with environmental training, only for EDCO registered courses attended internally and externally by non environmental practitioners who are required to		

	performance of their duties	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.		
Waste management Costs associated with the management of domestic and hazardous waste as per the waste directive.	Costs associated with the repair and maintenance of all sewerage pipes. Costs associated with all sewerage removal contracts			
	PCB: • 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**
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 too 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				

6.2. 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 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 line modifications due to environmental reasons.		R7,858,364.66

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.	**R1,044,032.76**	
Categories and activities	**Explanations**	**Examples**	**Operational costs**	**Capital costs**

Audits • Internal audits. • External audits	All costs associated with environmental audits			
Training **(internal and external)**	Costs associated with environmental training, for courses attended internally and externally, including environmental related interventions for non environmental practitioners who are required to incorporate environmental considerations in the performance of their duties	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.	**R16,876**	
Waste management Costs associated with the management of domestic and hazardous waste as per the waste directive.	Costs associated with the repair and maintenance of all sewerage pipes. Costs associated with all sewerage removal contracts			
	PCB:			

	• 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**
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 too 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				

7. GENERAL

7.1. 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 (Refer also Section 10.1). The necessary agreements reached shall be implemented to the satisfaction of the landowner.

7.2. AWARENESS AND TRAINING OF CONTRACTOR

7.3. 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:

1. Complaints received from Landowners and actions taken.
2. Environmental incidents, such as oil spills, concrete spills, etc. and actions taken (litigation excluded).
3. Incidents possibly leading to litigation and legal contravention's.
4. 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 dairy.
- 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.

7.4. AUDITS

During the construction period at least two (2) 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 DEAT or the ISO14001 auditors or combined audits.

7.4.1. Proposed Audit Programme

7.4.2. Audit Reporting

8. Conclusion