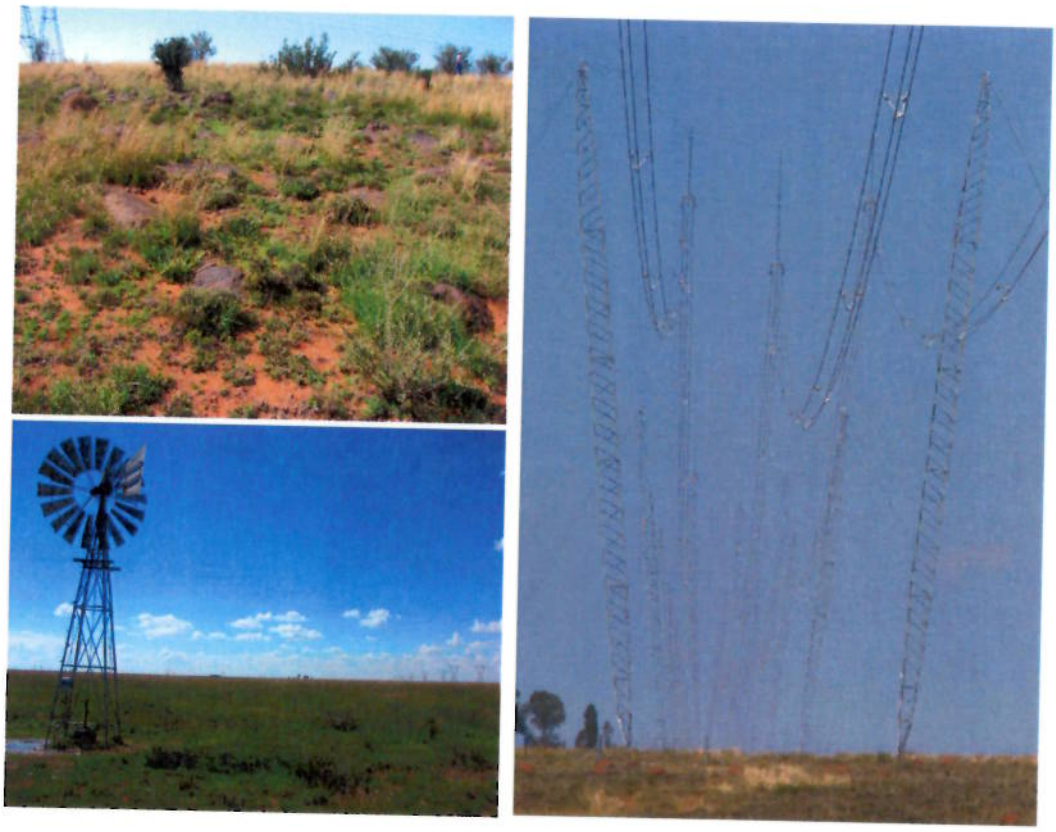
ESKOM HOLDINGS LIMITED

ENVIRONMENTAL MANAGEMENT PLAN FOR THE BETA TURN-INS TO PERSEUS, 765 KV TRANSMISSION LINES



Construction Environmental Management Plan

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April 2008

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN FOR BETA-PERSEUS 765 KV TRANSMISSION LINES

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ABRREVIATIONS

ARCUS GIBB	ARCUS GIBB (Pty) Ltd
CED	Capital Expansion Projects
CEMP	Construction Environmental Management Plan
CM	Contract Manager
DEAT	Department of Environmental Affairs and Tourism
ECO	Environmental Control Officer
Eskom	Eskom Holdings Limited – Transmission Division
EMP	Environmental Management Plan
PM	Project Manager
RoD	Record of Decision
SAHRA	South African Heritage Resources Agency
SS	Senior Site Supervisor

GLOSSARY OF TERMS

Audit	A verification process that is used to obtain information regarding the implementation of the EMP. It is an objective tool used to make improvements at the workplace
Berm	A barrier that is designed to divert surface water flow. Berms will primarily be used along roads/tracks to prevent a concentrated flow of water over particular areas, thereby reducing erosion of roads.
Bunding	An impervious containment system for potential spillages from tanks / containers stored on site. The bunded area shall have a capacity greater than 110% of the total tankage contained. The bunding shall be constructed of a material impermeable and resistant to the stored material.
Client	For the proposed 765 kV Transmission line project, Eskom Holdings Limited is the client.
Construction Activities	Any action undertaken by the contractor, suppliers, sub-contractors or employees during the construction process.
Contractor	Construction companies as well as their sub-consultants and suppliers appointed to undertake the construction activities on behalf of the client.
Construction camp	The area allocated for the establishment of equipment, repair area, ablution facilities, lie down and rest areas, etc. It also serves as the central point for the storage of fuel and construction material.
Environment	The surroundings within which humans exist and include biophysical, social and economic aspects. Examples include water, air, soil, plants and animals.
Environmental Control Officer (ECO)	Individual appointed by the project Manager and who is responsible for the implementation of the EMP, liaison between Eskom, Contractor and Landowners and monitoring, reviewing and verifying compliance with the CEMP by the Contractor.
Environmental Specification	A component of the contractor's construction activity that is likely to interact with and potentially impact on the environment.
Environmental Impact	A positive or negative change to the environment that results from the effect of a construction activity. The impact may be a direct or indirect consequence of a construction activity.
Environmental Management Plan (EMP)	An EMP is to be implemented by the appointed contactor, to ensure that environmental impacts that may occur due to construction activities are mitigated on site. An EMP provides environmental management guidelines, which must be complied with by the contractor in constructing the transmission line and associated towers. The undertaking of an EMP is in accordance with the requirements of the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations.
General Waste	Domestic, commercial, non-hazardous waste and builders rubble e.g. paper, plastics, food, tins, etc.
Hazardous substance	Any substance that is of risk to health and safety, property or the environment. Hazardous substances have been classified under the SABS Code 0288: 'The Identification and Classification of Dangerous Goods and Substances'.
Hazardous Waste	Any inorganic or organic element or compound that because of its toxicological, physical, chemical or persisting properties, may exercise detrimental acute or chronic impacts on human health or development. Hazardous wastes are classified in accordance with the 'Minimum Requirement for the Handling, Classification and Disposal of Hazardous Waste' published by the Department of Water Affairs and Forestry (1998).
Hazardous Waste Landfill Site	A waste disposal site that is designed and managed to accommodate the disposal of hazardous waste substances, and is permitted by the Department of Water Affairs and Forestry (DWAF).
Heritage site	A site that contains either archaeological artefacts, graves, buildings older than 60 years, meteorological or geological fossils etc.
Land owner	The individual or company that owns the land through which the servitude crosses.
Method Statement	Method Statements indicate how compliance with the Environmental Specification will be achieved. The Contractor shall submit a written Method Statement to the ECO for approval, covering those activities, which are identified (in this document and/or by the ECO), as being potentially harmful to the environment.

Servitude	Defined as "the right to use someone else's land, for a specified purpose". In the case of a transmission line servitude, is the right to erect, operate and maintain an electric line as well as enter that land for the execution of those activities. It does not constitute full ownership and access and activities should always be carried out with due respect for the landowner. A servitude is registered in the Deeds office and forms part of the title deed of a property.
Social Environment	All the persons/farmers that are likely to be directly or indirectly affected by the 765 kV transmission line construction activities.
Spoil	Uncontaminated soil removed during excavations, culverts and roads.
Topsoil	The layer of soil covering the ground that allows for the successful germination of seeds, water penetration and is a source of micro-organisms and plant nutrient.
Watercourse	A natural channel in which water flows regularly or intermittently.
Workforce	All people involved in the construction activities of the 765kV transmission line and associated infrastructure, including people employed by the client or contractor, either permanent of casual staff.

1 BACKGROUND AND INTRODUCTION

1.1 Introduction

Eskom Holdings Limited Transmission Division (Eskom) proposes to expand its Transmission Power line network and associated infrastructure between the Perseus substation and the Beta substation near the town of Dealesville in the Free State Province. The power lines will form part of Eskom's larger network strengthening programme, which aims to meet increased electricity demand in South Africa.

To achieve the above, Eskom Holdings Limited proposes to construct two 765 kV Transmission Power lines, approximately 13 km in length, between the Perseus Substation and a point on the existing Hydra-Perseus 765 kV line at the Beta Substation south-west of Dealesville ('Beta-Perseus Turn-in')(See **APPENDIX 1**).

1.2 Background

An Environmental Impact Assessment for the proposed 765 kV Transmission Power lines from the existing Perseus substation and a point on the existing Hydra-Perseus power lines adjacent to the Beta substation in the Free State Province was undertaken by ARCUS GIBB (Pty) Ltd in 2006. A favourable Record of Decision (RoD) was received from the National Department of Environmental Affairs and Tourism (DEAT) (Reference No.: 12/12/20/782 and 12/12/20/828) on 29 August 2007) (See **APPENDIX 2**). Authorisation was granted for the following activities:

- The extension of the Perseus 400 kV Transmission substation near Dealsville to construct a new 765 kV high voltage yard (50ha);
- **The construction of 2 x 765 kV Transmission power lines (13km) between Perseus substation and Beta substation, both near Dealsville (the subject of this EMP);**
- The construction of 1 x 765 kV Transmission power line between Perseus substation near Dealsville and Hydra substation near De Aar (296 km)
- The servitude width required for the construction of the power line is 80 m per 765 kV line with a separation of 80 m from centre line to centre line where the 765 kV line is constructed parallel to any other power line.

A number of conditions of approval were recorded in the RoD, which have been taken into account in compiling this EMP.

1.2.1 Scope of the EMP

As a condition of the RoD, a Construction Environmental Management Plan (CEMP) must be compiled and approved by DEAT, prior to the commencement of construction activities for the proposed project. This document is also in accordance with the requirements of the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations. These state that an Environmental Management Plan (EMP) is to be implemented by the appointed contactor, which will ensure that environmental impacts that may occur due to construction activities are mitigated on site.

The CEMP will provide environmental management guidelines, which must be complied with by the contractor in constructing the transmission line, associated towers and substation, in fulfilment of ISO 14001 requirements. The Environmental Control Officer (ECO), acting on behalf of Eskom Holdings Limited, will monitor the implementation of the CEMP. The CEMP will form part of the contractual agreement to be entered into by Eskom and the appointed contractor. Compliance with the CEMP must therefore form part of all contactor's working tender documentation and be endorsed contractually. The recommendations and constraints, as set out in this document are enforceable under the General Conditions of Contract.

1.2.2 Objectives of the CEMP

The long-term objective of this CEMP is to ensure that:

1. Environmental Management conditions and requirements are implemented from the start of the project;
2. Precautions against damage and claims arising from damage are taken timeously,
3. The completion date of the contract is not delayed due to problems with Landowners arising during the course of construction;
4. The Contractor is able to and shall include any costs of compliance with this CEMP into the tender price;
5. Precautions against environmental damage and claims arising from such damage are taken timeously;
6. The completion date of the contract is not delayed due to environmental problems with the Landowner, Grid staff, Communities or Regulatory Authorities arising during the course of the project execution; and
7. The asset created conforms to environmental standards required by ISO 14001 and Transmission Policy.

The CEMP requires a commitment from the Eskom Project Manager and the Contractor on the following issues:

1. Take into consideration the Landowner special conditions as the line traverses private property;
2. To underwrite Eskom Transmission's Environmental Policy TPL41-435 at all times (See **APPENDIX 3**);
3. Ensure environmental conditions stipulated in the Record of Decision (ROD) are implemented;
4. Resolve problems and claims arising from damage immediately to ensure a smooth flow of operations;
5. To implement this Environmental Management Plan for the benefit of all involved; and
6. To preserve the natural environment by limiting destructive actions on site.

1.2.3 Legislative Framework

All legislation applicable to the development must be strictly enforced both during the construction and operational phases. The contractor must be acquainted with the relevant environmental legislation, including provincial and local government regulations, which are in place to ensure the protection of the environment. The environmental legislation applicable to the project includes, but is not limited to, the following:

- The Constitution of the Republic of South Africa, 1996

- National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA)
- NEMA: Air Quality Management Act (Act No 39 of 2004)
- National Water Act, 1998 (Act No 36 of 1998)
- Hazardous Substances Act, 1973 (Act No 15 of 1973)
- Fire Brigade Services Act, 1987 (Act No 99 of 1987)
- National Heritage Resources Act, 1999 (Act No 25 of 1999)
- Conservation of Agricultural Resources Act, 1977 (Act No 103 of 1977)
- Occupational Health and Safety Act, 1993 (Act No 85 of 1993)
- The White paper on integrated pollution and waste management of South Africa

(a) Permits that may be required

Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act 1998 (Act No. 36 of 1998), and therefore may well require the application of a Water Use License. Therefore, the contractor must in consultation with the ECO, assess all areas along the alignment well in advance in order to ensure the relevant Water Use License is applied for where required.

1.2.4 Environmental management policies adopted by Eskom Transmission

Eskom Transmission's Environmental Policy (TPL 41-435) describes Eskom Transmission's commitment to environmental best practise. Their policy statement states that Eskom Transmission will:

- Continually improve environmental performance
- Comply with applicable legislation and regulations as well as Eskom Holdings policies and guidelines as a minimum
- Prevent pollution of the environment

While their strategy is to minimise and prevent environmental impact by setting policy related objectives and targets in a number of areas including but not limited to:

- Undertaking Environmental Assessments - which states that Eskom Transmission will conduct environmental assessments of its activities and that this information would then be used to identify and prioritise the significant environmental aspects and to develop appropriate environmental management processes. This EMP is evidence of such commitment,
- Environmental Incidents and Wildlife interactions – which states that Eskom Transmission must identify potential significant environmental incidents and risks and develop plans to prevent, correct and monitor their effects should they occur. This EMP also addresses this component of the environmental policy.

Eskom Transmission is committed to addressing its environmental policy requirements. The monitoring and implementation of this EMP will provide additional support to this commitment

1.2.5 CEMP Methodology

A project team including environmental consultants and various specialists have compiled this CEMP. The specialists and their associated studies which were undertaken to inform the CEMP are listed in the table below:

Specialist	Organisation	Study/Function
Ashlea Strong / Tim Liversage/ Julian Warbreck	ARCUS GIBB	Lead Environmental Consultants
Willem De Frey	Eko Info CC	Flora Assessment
Dewald Kamffer	Eko Info CC	Faunal Assessment
Jon Smallie	Endangered Wildlife Trust	Avifaunal Study

Prior to a three-day site visit to the proposed Beta-Perseus Turn-in alignment the specialists were provided with the profiles of this section of the line for the initial identification of potential sensitive / problematic areas. This site visit was undertaken between and including the 1st and 3rd of April 2008. The project team was accompanied by a technical person from Eskom Transmission. The project team undertook individual specialist assessments of all the proposed tower locations. Where the tower positions were found to be inappropriate from either an environmental perspective recommendations for alternative locations of towers were made and recorded. In addition, the project team identified sensitive micro-environments along the route, which included water bodies, areas of high erosion, avifauna niches and ecologically significant areas.

The assessment of tower positions started at the northern end of the proposed Beta-Perseus Turn-in route, at the Perseus Substation, and proceeded south to the Beta Substation. During the site visit, the tower positions were assessed either by physically walking to each co-ordinate or for those in homogeneous environments doing a drive by and noting the surrounding environment.

On completion of the site inspection, an integration workshop was held where the detailed route alignment and tower positions were discussed in detail by the project team.

The specialist reports submitted, including potential impacts and recommendations for mitigation measures for this powerline have all been incorporated into the CEMP.

1.3 Description of the Affected Environment

1.3.1 Introduction

The landscape through which the Transmission line is aligned is generally described as an extensive large plains vegetated by grass and low (400 mm high) shrubs, with irregularly spaced low ridges and koppies that are mostly flat topped. This area is largely homogenous and similar environmental impacts are associated with the entire length of the line.

In general, the area through which the Transmission line crosses is not regarded as highly sensitive, while habitat diversity is fairly low. However, at several tower sites the vegetation seems to be more sensitive (drainage channels, rocky outcrops etc.).

1.3.2 Potential environmental impacts identified by the project team

Notwithstanding the potential environmental impacts identified in the EIA that preceded this CEMP, the CEMP project team as well as impacts identified by Eskom through their past experience have been considered in this comprehensive CEMP. These include the following:

- Potential impacts on ecology (fauna and flora);
- Potential impacts on avifauna;
- Potential visual impacts;
- Potential impacts on heritage / archaeology sites;
- Potential impacts on surface water; and
- Potential social impacts.

1.4 Project Description

The project involves the construction of a 765 kV transmission line of approximately 13 km between Perseus Substation and a point on the existing Hydra-Perseus 765 kV line at the Beta Substation south-west of Dealesville.

1.4.1 Technical specifications of the Beta-Perseus Transmission lines

Two 765 kV Transmission lines will be constructed parallel between the Perseus Substation and a point on the existing Hydra-Perseus Transmission line near the Beta Substation. The Transmission lines will be constructed over a distance of approximately 13 km. Two 80 m servitudes are required to accommodate the towers that will support the 765 kV Transmission lines. For the majority of the route, the compact Guyed - V tower (see **Figure 1.1** below) will be used, while one of four different self-supporting strain towers will be used at bend points (See **Figure 1.2** for an example).

The Guyed-V tower has a maximum footprint of approximately 80 m x 40 m and a height of 45 m (see **Figure 1.1** below).

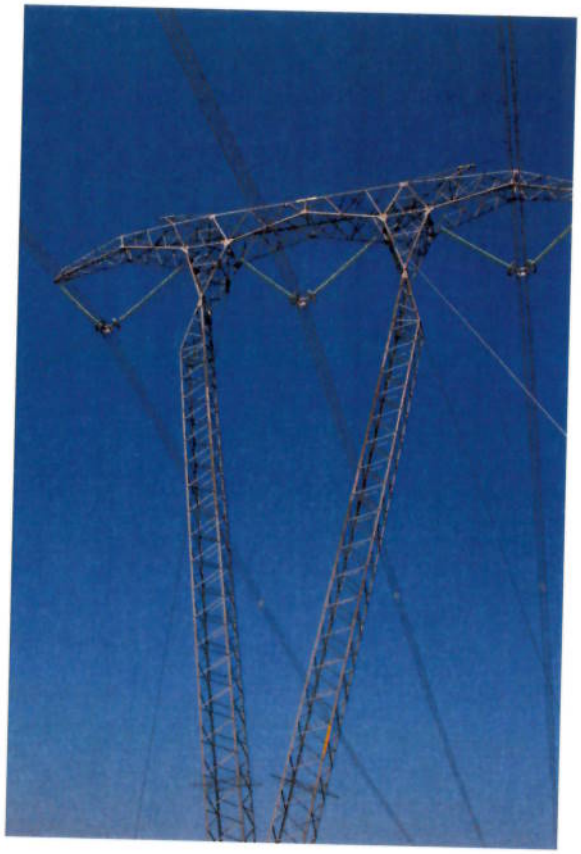

Figure 1.1: Photograph of the Guyed - V Tower

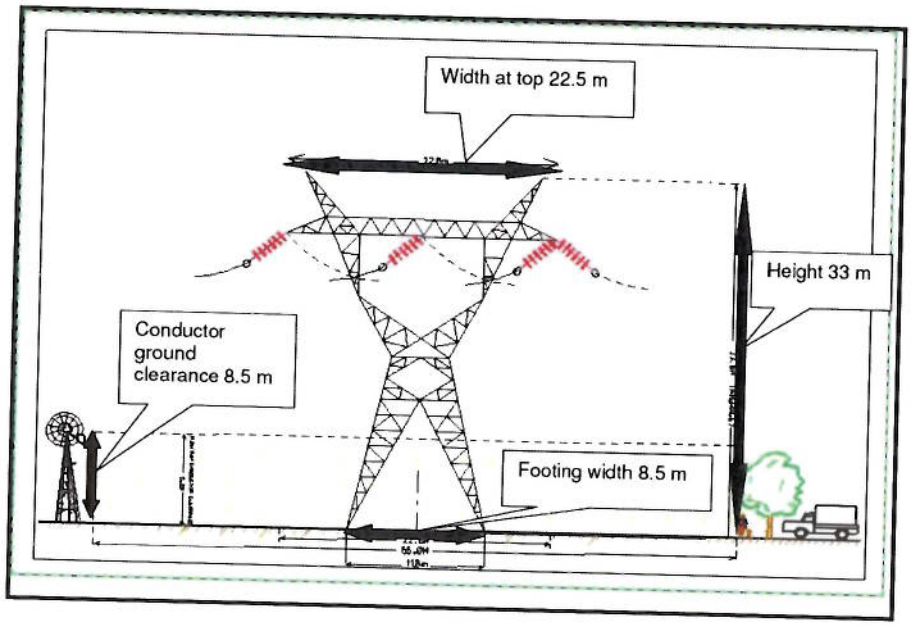

Figure 1.2: Diagram of an example of a Strain Tower

1.4.2 Major Construction activities of the project

The construction of the 765 kV Transmissions lines will require the following construction related activities, amongst others:

1. Determination of appropriate location for construction camp site and the erection thereof in consultation with the ECO;
2. Bush clearing at tower locations, to facilitate access where necessary, for construction and the safe operation and maintenance of the line as required;
3. Transportation of construction materials, equipment and workforce;
4. Installation of foundations for the towers, which involves placing construction material into piles and fencing the area with wire strands;
5. Steelwork;
6. Tower assembly, which will require many construction staff;
7. Erection of towers which will be completed with the painting of nuts and bolts prior to erection;
8. Stringing and regulation of conductors;
9. Rehabilitation of disturbed areas (to start after a maximum of 60 towers have been strung). This will include re-vegetation where necessary and measures for erosion prevention of tracks;
10. Final inspection of the line and hand over to the region for operation;
11. Signing off landowners;
12. Handing and taking over of the servitude;
13. Operation and maintenance of the line;
14. Negotiations for access roads to the servitude where required; and
15. Servitude gate installation to facilitate access to the servitude.

One year after the completion of the project, the final inspection for the release of the Contractors' guarantee will take place. The line will be in operation immediately after completion of the project and will stay operational for the 30-year lifetime of the line / substation. Ongoing maintenance and refurbishment of the line and substation may extend the operational lifetime to approximately 50 years.

A detailed activity list for the construction of a transmission line is included in **APPENDIX 4**

1.5 Environmental Monitoring and Auditing

To measure and ensure compliance to this EMP it is imperative that a monitoring and auditing programme be established, in which monthly reports are submitted to Eskom and DEAT to indicate the level of compliance. In addition, potential risks to the project will be identified.

Bearing in mind that this document is a living document and may be updated from time to time, should any amendments be considered such amendments need to be discussed with the appointed ECO, who will then make such amendments to the EMP if considered to be applicable. The amended EMP will be submitted to DEAT to inform them of what changes have been implemented and why.

2 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

2.1 Organisational requirements

During construction, all instructions and official communications regarding environmental matters shall follow the organisational structure shown in **Figure 2.1**. The organisational structure identifies and defines the authorities structure, and the communication structure for the various parties involved in the construction of the proposed development.

Capital Expansion Projects (CEP) will act as the Project Manager for the proposed development. The Consultant/Engineer shall appoint a Site Supervisor / Contract Manager on site to co-ordinate and monitor the Contractor during the construction of the development.

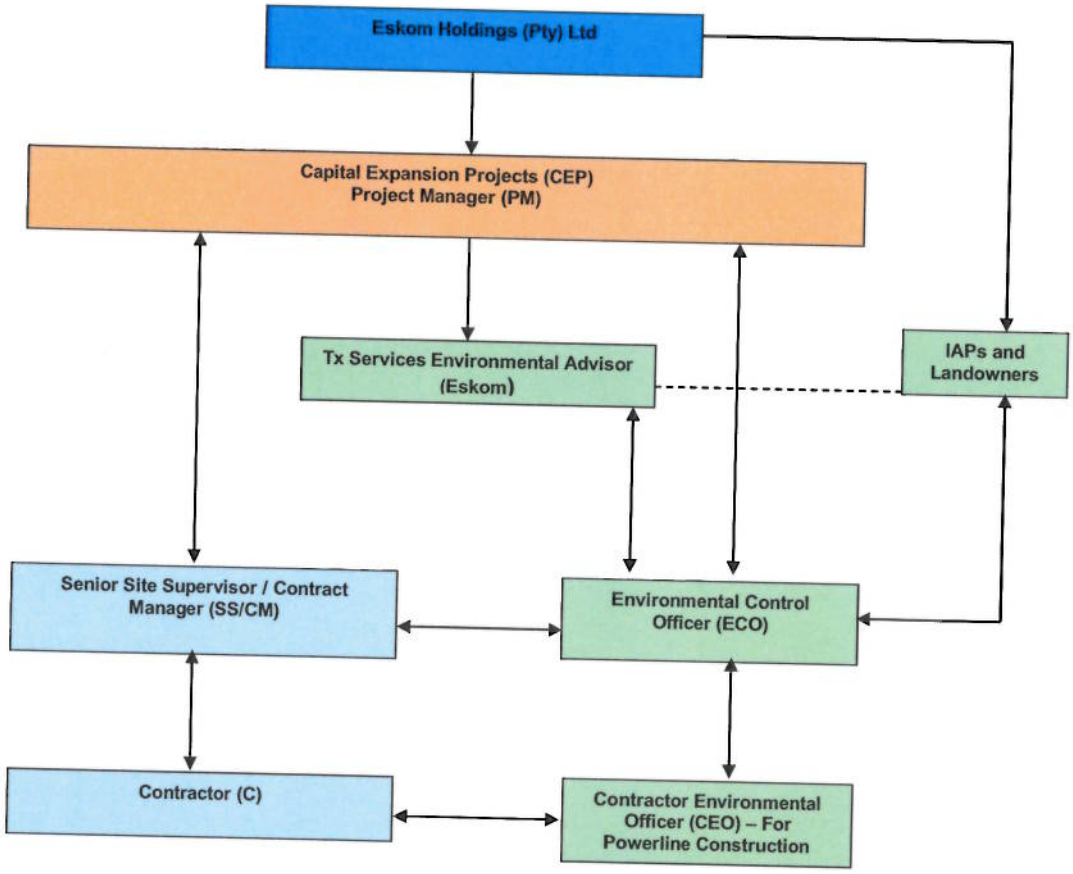

Figure 2.1: Organisational / Reporting Structure for implementation of the CEMP

CEP shall appoint an independent Environmental Control Officer (ECO) to oversee the implementation of the CEMP on site. It will be the responsibility of the ECO to consult with the Resident Engineer (RE) regarding instructions pertaining to contravention, corrective actions, and penalties or working methods. Except in an emergency situation, where instructions may be given directly to the Contractor, all instructions given by the ECO shall go through the Site Supervisor/Contract Manager (SS/CM), who will then convey these to the Contractor.

The CEMP will be an item of the monthly site meetings, and the ECO shall attend these meetings in order to provide input with respect to compliance with the CEMP. Copies of the minutes will be sent to Eskom.

2.2 Community Relations

When specified, the Contractor shall erect an information board containing background information for the construction activity and listing the relevant contact details of responsible persons.

The number, location and type of information boards will be specified in the Contract documents.

2.3 Penalties

The RE, in consultation or on the advice of the ECO, shall issue spot fines if the Contractor infringes these specifications. The Contractor shall be advised in writing of the nature of the infringement and the amount of the spot fine. The Contractor shall be liable for the fine and it is his/her responsibility to recover the fine from the relevant employee. The Contractor shall also take the necessary steps (e.g. training) to prevent a recurrence of the infringement. It is preferable if this training is provided in consultation with the ECO.

The Contractor is also advised that the imposition of spot fines does not replace any legal proceedings the authorities, landowners and/or members of the public may institute against the Contractor. Spot fines shall be between R500.00 and R1 000.00, depending upon the severity of the infringement. The decision on how much to impose will be made by the ECO/RE and will be final.

In addition to the spot fine, the Contractor shall be required to make good any damage caused as a result of the infringement at his own expense.

A preliminary list of infringements for which spot fines will be imposed is as follows:

- Using areas outside the working areas without permission/accessing "no-go areas";
- Clearing and/or levelling area outside of the working areas;
- Littering of the site and surrounds;
- Burying waste on site and surrounds;
- Making fires on site;
- Spillage onto the ground or water bodies of oil, diesel, etc;

- Picking/damaging plant material;
- Damaging/killing wild or domestic animals/birds;
- Discharging effluent and/or stormwater onto the ground or into surface water;
- Repeated contravention of the specification or failure to comply with instruction;
- Additional fines as determined by the ECO and added to this list; and
- Damage to heritage sites.

The RE shall:

- Retain records for fines issued. Monies for the spot fines will be deducted from the Contractors monthly certificate.
- The RE, on recommendation from the ECO, may also order the Contractor to suspend part or all the works if the Contractor repeatedly causes damage to the environment by not adhering to the CEMP (i.e. more than 3 cases of repeated infringements). The suspension will be enforced until such time as the offending actions, procedure or equipment is corrected. No extension of time will be granted for such delays and all costs will be borne by the Contractor.

2.4 Payment for Environmental Specifications

The Contractor's costs incurred for compliance with this CEMP shall be on a lump sum basis.

2.5 Roles and Responsibilities

Function	Name / Cell Number	Responsibility
Project Manager (PM) Capital Expansion Projects		The overall management of the project and implementation, administration and enforcement of the CEMP. The PM shall: • Ensure that the CEMP specifications are included in all tender documents issued for the development works and activities on site, and shall ensure that the prospective Tenderers/Contractors abide by the provisions thereof; • Appoint an ECO to monitor implementation of and compliance with the CEMP for the duration of the works. The SS/CM may be required to fulfil this function when the ECO is not available; • Be liable/accountable, to the relevant authority, DEAT, for any contravention/non-compliance by any Contractor under their supervision; and • Through the SS/CM, issue fines or stop works orders for contravention of the CEMP and give instruction regarding corrective action
Senior Site Supervisor (SS)/ Contract Manager (CM)		Oversees site works, liaison with Contractor, PM and ECO. The SS/CM will be responsible for monitoring, reviewing and verifying compliance with the CEMP by the Contractor when the ECO is not available. The CM's duties, over and above his contractual obligations, will include the following: • Comply with the contents of this CEMP specifications to ensure that the requirements of the CEMP are met; • Monitor and verify that the CEMP is adhered to at all times and take action if the specifications are not followed; • Monitor and verify that environmental impacts are kept to a minimum; • Review construction Method Statements in conjunction with the ECO; • Assist the Contractor in finding environmentally responsible solutions to problems with input from the ECO; • Keep records of all activities/incidents concerning the environment in the site diary; • Inspect the site and surrounding areas on a weekly basis with regard to compliance with the CEMP; • Order the removal of, or issuing spot fines for, person(s) and/or equipment not complying with the specifications; and • Issue penalties for contravention of the CEMP.
Environmental Control Officer (ECO)		Implementation of CEMP, liaison between Eskom, Contractor and Landowners and monitoring, reviewing and verifying compliance with the CEMP by the Contractor. In particular, the ECO shall: • Be appointed by the PM to monitor all activities on site; • Visit/inspect the site on a monthly basis, to ascertain the level of compliance of works, as well as attend Contractor's meetings when necessary and monthly site meetings with the project management team and report back on the environmental issues; • Maintain inspection audit reports on file; • Assist the SS/CM in ensuring that necessary environmental authorisations and permits have been obtained; • Monitor and verify that the CEMP is adhered to at all times and take action if the specifications are not followed; • Monitor and verify that environmental impacts are kept to a minimum; • Review and approve construction Method Statements together with the SS/CM;

		• Assist the Contractor in finding environmentally responsible solutions to problems; • Keep records of all activities/incidents concerning the environment on site in the Site Diary; • Keep a register of complaints in the Site Office (to be situated in proximity to where the works are taking place) and deal with any community comments or issues; • Monitor the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site or present environmental awareness courses themselves; • Provide material/manuals and assistance for the environmental awareness courses; • Advise on the removal of person(s) and/or equipment not complying with the specifications (done via the SS/CM); • Recommend the issuing of fines for transgressions of site rules and penalties for contravention; • Maintain a photographic record of the site before, during and after construction; • Ensure that activities on site comply with legislation of relevance to the environment; • Complete checklists as necessary; and • Internally review the implementation of the CEMP and submit a report to Eskom and DEAT at the end of the project.
Contractor (C)		Implementation and compliance with recommendations and conditions of the CEMP. The Contractor shall: • Ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts; • Ensure that all employees and sub-contractors employed comply with the requirements and provisions of the CEMP; • Prepare Method Statements for submission to the ECO; • Monitor environmental performance and conformance with the specifications contained in this document during daily site inspections; • Discuss implementation of and compliance with this document with staff at routine site meetings; • Be responsible for sub-contractors preparing sites and erecting the towers; • Report progress towards implementation of and non-conformances with this document at site meetings with the ECO; • Notify the ECO of the anticipated programme of works and fully disclose all details of activities involved; • Ensure that suitable records are kept and that the appropriate documentation is available to the ECO; • Notify the ECO of all incidents, accidents and transgressions on site with respect to environmental management as well as requirements of the CEMP and corrective actions/remedial action taken; • Report and record all accidents and incidents resulting in injury or death; • Inform the ECO of problems arising when implementing the CEMP and recommend ways of improving it; • Inform the ECO of any complaints received; and • Appoint a dedicated person (Contractor Environmental Control Officer) to work with the ECO
Contractor Environmental Control Officer (CECO)		Appointed by the contractor for the Implementation of the CEMP, landowner interaction, environmental control of site actions, re-mediation and rehabilitation work; and • Be available to investigate all problems arising on the work sites concerning the Landowners.
Tx Services Environmental Advisor (Eskom)		• Environmental advice and auditing.

2.6 Method Statements

The Contractor shall submit a written Method Statement to the ECO for approval, covering those activities, which are identified (in this document and/or by the ECO), as being potentially harmful to the environment.

Method Statements indicate how compliance with the Environmental Specification will be achieved.

The Method Statement shall state clearly:

- Timing of activities;
- Materials to be used;
- Equipment and staffing requirements;
- Proposed construction procedure designed to implement the relevant environmental specifications;
- The system to be implemented to ensure compliance with the above; and
- Other information deemed necessary by the ECO.

The Method Statement shall be submitted at least 14 working days prior to projected commencement of work on an activity, to allow the ECO time to study and approve the Method Statement. The Contractor shall not commence work on that activity until such time as the Method Statement has been approved in writing by the ECO, which shall be done within 7 working days of receipt.

Due to changing circumstances, it may be necessary to modify Method Statements. In such cases, the proposed modifications must be indicated and agreed upon in writing between the ECO and RE.

The ECO and RE must retain records of any amendments and ensure that the most current version of any Method Statement is being used.

The following are typical Method Statements, which will be called for by the ECO:

- Location, layout and preparation of the construction camp(s) and materials storage areas;
- Location, layout and preparation of cement/concrete batching facilities including the methods employed for the mixing of concrete and the management of runoff water from such areas;
- Contaminated water management plan, including the containment of runoff and polluted water;
- Emergency construction Method Statements (including details of methods for fuel spills and clean up operations);
- Rehabilitation of disturbed areas and revegetation after construction is complete;
- Solid waste management and removal of waste from site; and
- Crossing of erosion trenches and drainage lines.

The specific activities for which a Method Statement is required is indicated in Section 2.7 by the following asterisk (√) Please note that wherever the √ appears, the Contractor shall submit a Method Statement. Additional Method Statements may be required by the ECO during the course of works, depending on the nature of the construction works and the location thereof.

The SS and ECO shall approve any deviation from a Method Statement.

2.7 Environmental Specifications for the Construction Phase of the Development

Environmental Specifications	Responsible Individual	Frequency	Method Statement Required
2.7.1 Site Monitoring, Auditing and Reporting			
• Records must be kept on site in accordance with the standard Eskom site documentation. The documentation shall be signed by all parties to ensure that such documents are legal. **The following documentation shall be kept on site:** 1. Access negotiations and physical access plan; 2. Complaints register; 3. Site daily diary; 4. Records of all remediation / rehabilitation activities; 5. Copies of two-weekly reports to the Tx Services Environmental Advisor; 6. Copy of the Construction Environmental Management Plan; 7. Environmental Incident Log; 8. ECO inspection audit reports; and 9. The Record of Decision issued for the project.	Contractor / CECO	Continuous	
• The site camp will be audited on a monthly basis by the ECO.	ECO	Monthly	
• All records relating to monitoring and auditing must be made available for inspection to any relevant authority, or Eskom's Environmental Audit Team (Tx Services Environmental Advisor), in respect of the development.	Contractor / CECO	As necessary	
• DEAT reserves the right to monitor and audit the development throughout its full life cycle to ensure compliance with the RoD as well as mitigation measures in the final scoping report and the this CEMP.	Contractor / CECO	As necessary	

Environmental Specifications	Responsible Individual	Frequency	Method Statement Required
• The Landowners shall always be kept informed about any changes to the construction programme should they be involved. • All contact with the Landowners shall be courteous at all times and a record of all conversations must be kept. • The rights of the Landowners shall be respected at all times and all staff shall be sensitized to the fact that they are working on private property. • The contact numbers of the Contractor's ECO officer and the Eskom ECO shall be made available to the Landowners as this will ensure open channels of communication and prompt response to queries and claims.	ECO / CECO	As necessary	
Management objectives	**Measurable targets**		
• Maintain good relations with Landowners • Maintain accurate records in order to prove compliance to the EMP and Eskom's commitment to fulfilling these requirements	• No delays in the project due to Landowner interference • Landowner signs final release form		
2.7.2 Environmental Induction Training			
• An initial environmental awareness training session is required prior to any work commencing.	ECO / CECO	When new staff are contracted	√
• The contractor must ensure that all site staff are aware of, and understand the contents and conditions of the CEMP, the key environmental issues and the consequences of non-compliance.	Contractor	As necessary	
• The ECO will provide the Contractor with the course content for the environmental awareness-training course, and the Contractor shall communicate this information to his employees on the site, to any new employees coming onto site, to his subcontractors, causal labourers and to his suppliers.	Contractor / ECO	As necessary	
• All site staff must attend induction training on the CEMP and a record must be kept of all attendees.	Contractor	As necessary	
• Induction training must be undertaken in a language that is understood by site staff and must include the following topics: o Key potential or actual environmental construction related impacts on site related environmental precautions, which need to be taken to avoid or mitigate these impacts, o Key mitigation measures to be implemented during construction activities; o Emergency responses to issues on site; o Roles and responsibilities of all staff on site; o The benefits of achieving conformance with, and consequences of transgressions of environmental specifications or requirements of the CEMP.	Contractor / ECO	As necessary	

Environmental Specifications	Responsible Individual	Frequency	Method Statement Required
2.7.3 Planning and Site Preparation			
• All work must be undertaken in an environmentally sensitive manner.	Contractor	Continuous	
• A precautionary approach must be adopted with any works deviating from specifications being approved by both the SS/CM and ECO.	Contractor	Continuous	
• Campsite establishment including proposed layout and location must be approved by the ECO prior to commencement of construction. A method statement must be supplied by the contactor for campsite establishment and must be approved by the ECO.	Contractor / ECO	Prior to construction	√
• The landowner of the farm on which the campsite is proposed must be consulted and approval must be granted in writing prior to the establishment of the campsite.	Contractor / ECO	Prior to construction	√
• The number of construction camps required must be decided in conjunction with the PM, Contractor, ECO, and Landowners.	Contractor / PM / ECO / CECO	Prior to construction	
• The footprint of the campsite and access roads must be kept to a minimum to ensure the least environmental impacts.	Contractor / CECO	Continuous	√
• The campsite is to be located a minimum horizontal distance of 200m from any watercourse or above the 1:10 year floodline or 32 m from the bank.	Contractor / ECO / CECO	As necessary	√
• Operation of heavy machinery and construction equipment known to produce high noise levels shall be limited. Silent compressors must be used. Noise generated by employees shouting or whistling must also be limited.	Contractor	Continuous	
• Appropriate safety and precaution signs shall be erected prior to the start of construction at all access points to and from the site and all areas in close proximity to the public..	Contractor	Continuous	
• Installation of amenities, such as ablution facilities, shall take place prior to construction activities commencing.	Contractor	Prior to construction	√
• The necessary ablution facilities with chemical toilets shall be provided at the construction camp. The Contractor shall supply a wastewater management system that will comply with legal requirements. The ECO and Eskom must approve this.	Contractor / ECO	Prior to construction	√
• Storm water control berms (trench and/or earth barriers) shall be constructed to divert rainwater around the campsite and to contain any dirty water running from the campsite.	Contractor	Prior to an throughout construction	√
• Sewerage and waste-water at the camp-sites have to be removed to an approved sewerage treatment works.	Contractor	Continuous	
2.7.4 Demarcation of the Site			
• The construction campsite shall be fenced and working areas secured before construction can proceed.	Contractor	Once off	

Environmental Specifications	Responsible Individual	Frequency	Method Statement Required
• "No-go" areas shall be demarcated by fences steel standards and four strands of wire, and personnel and equipment shall not be permitted within these areas. Danger tape may not be used due to the risk of it being eaten by livestock.	Contractor / CECO	Continuous	
• An area of the campsite shall be dedicated to the storage of materials and plant equipment.	Contractor	Once off	
2.7.5 Site Clearance			
• Removal of any protected and unprotected vegetation shall be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible.	Contractor / CECO	Continuous	√
• All earthworks and excavations must be undertaken in such a manner so as to minimise the extent of any impacts caused by such activities.	Contractor	Continuous	
• Disturbance of vegetation must be limited to areas of construction.	Contractor	Continuous	
• The removal or picking of any protected or unprotected plants shall not be permitted and no horticultural specimens (even within the demarcated working area) shall be removed, damaged or tampered with unless agreed to by the ECO.	Contractor / CECO / ECO	Continuous	
• Impacts on surrounding servitudes shall be avoided at all costs.	Contractor	Continuous	
• The topsoil (i.e. the top 30-50 cm of soil) must be stockpiled in a suitable place in order to be replaced on top of the exposed subsoil during rehabilitation.	Contractor / CECO	As necessary	
• Soil stockpiles should not exceed 2 m in height.	Contractor / CECO	As necessary	
• Erosion damage to soil stockpiles should be prevented with soil conservation works such as deflection berms etc.	Contractor	As necessary	
• Topsoil stockpiles older than 6 months should be upgraded/enriched before used to ensure the effectiveness of the topsoil.	Contractor / CECO	As necessary	
• After completion of construction, the site should be properly cleared of all excavated material (rocks, excess soil etc.) and construction rubble, waste, litter etc. and properly rehabilitated/revegetated.	Contractor / ECO	On completion of construction	
2.7.6 Access to Site			
• The site and associated infrastructure and equipment shall be off-limits to the public.	Contractor	Continuous	
• All construction vehicles using public roads shall be in a roadworthy condition.	Contractor	Continuous	
• Vehicle speeds shall not exceed 40km/h along untarred roads or when traversing unconsolidated and non-vegetated areas. Where required, speed limits must be indicated on the roads.	Contractor	Continuous	
• Access routes shall be planned in conjunction with the Contractor, Eskom and the Landowners. All agreements reached shall be documented in writing and no verbal agreements should be made.	Contractor / Eskom	Prior to construction	

Environmental Specifications	Responsible Individual	Frequency	Method Statement Required
• Where in the opinion of the SS and/or PM, inordinate and irreparable damage would result from the development of access roads, the *Contractor* shall use alternative construction methods compatible with the access and terrain, as agreed with the PM.	Contractor	As necessary	√
• The SS shall, together with a representative of the Contractor, negotiate with each landowner the access to reach the servitude and each tower position. The access agreement will be formalised in the form "TPC41-340 – Access to Farms" and signed by the three parties (See **APPENDIX 5**). • The Contractor will mark the proposed route and/or a competent representative will accompany the equipment when opening the access. • Any deviation from the written agreement shall be closed and re-vegetated immediately, as stipulated in TGL41-334 (See **APPENDIX 6**)	SS / Contractor / CECO	As necessary	
• The *Contractor* shall signpost the access roads to the tower positions, immediately after the access has been negotiated.	Contractor	Once access has been negotiated.	
(a) Use of existing roads			
• Maximum use of both the existing servitudes and the existing roads shall be made. In circumstances where private roads must be used, the condition of the said roads must be recorded prior to use (e.g. photographed) and the condition thereof agreed by the landowner, the SS and the *Contractor* (TGL41-334 (See **APPENDIX 6**)).	Contractor / CECO	Prior to use of roads	
• All private roads used for access to the servitude shall be maintained by the *Contractor* and upon completion of the *works*, be left in at least the original condition.	Contractor	Continuous	
• Existing water diversion berms are to be maintained during construction and upon Completion be repaired as instructed by the SS.	Contractor / CECO / SS	Continuous	√
(b) Construction of new roads			
• Access shall not necessarily be continuous along the line, and the *Contractor* must therefore acquaint himself with the physical access restrictions such as rivers, roads, etc. along the line. As far as possible, access roads shall follow the contour in hilly areas, as opposed to winding down steep slopes.	Contractor / CECO	Prior to construction	
• Access is to be established by vehicles passing over the same track on natural ground, multiple tracks are not permitted. Access roads shall only be constructed where necessary at watercourses, on steep slopes or where boulders prohibit vehicular traffic. The ECO would need to determine if any other passing would be required in such cases.	Contractor / CECO / ECO	Prior to construction	√
• The *Contractor* is to inform the SS before entering any of the following areas: **i)** Naturally wet areas: vleis, swamps, etc **ii)** Any area after rain **iii)** Any environmentally sensitive area	Contractor / CECO	As necessary	

Environmental Specifications	Responsible Individual	Frequency	Method Statement Required
• If access is across running water, the *Contractor* shall take precautions not to impede the natural flow of water. If instructed, the *Contractor* is to stone pitch the crossing point. There shall be no pollution of water. Access across running water and the method of crossing shall be at the approval of the SS and the landowner.	Contractor / CECO / ECO / SS	As necessary	√
• Where construction of a new road has been agreed, the road width shall be determined by need, such as equipment size, and shall be no wider than necessary.	Contractor / ECO	Prior to construction	
• In areas over 4% sideslope, roads may be constructed to a 4% outslope. The road shall be constructed so that material will not be accumulated in one pile or piles, but distributed as evenly as possible. The material shall be side-cast as construction proceeds, and shall not be side-cast so as to make a barrier on the downhill side. The cut banks shall not overhang the road cut, and shall if necessary be trimmed back at an angle which would ensure stability of the slope for the duration of the *works*. The sides or shoulders of roads shall not act as a canal or watercourse.	Contractor / CECO	Prior to construction	√
• Water diversion berms shall be built immediately after the opening of the new access road. In addition, water outlets shall be made at intervals where berms are installed, and suitably stone pitched if instructed by the SS.	Contractor / CECO / SS	Upon completion of new roads	√
• No cutting and filling shall be allowed in areas of 4% sideslope and less.	Contractor / CECO	As necessary	
• Existing land contours shall not be crossed by vehicles and equipment unless agreed upon, in writing, by the landowner and the SS.	Contractor / CECO / SS	As necessary	
• Existing drainage systems shall not be blocked or altered in any way.	Contractor / CECO	Continuous	
• No painting or marking of rocks or vegetation to identify locality or other information shall be allowed as it will disfigure the natural setting. Marking shall be done by steel stakes with tags, if required.	Contractor / CECO	As necessary	
The cutting down of bushes and trees to gain line of sight must be minimised as it will damage the visual character of the particular site.	Contractor / CECO	As necessary	
Select alignments for roads that minimise adjacent landform change such as cut and fill sections.	Contractor/ CECO	As necessary	√
In cut sections strip the top layer of soil (minimum 150 mm), stockpile upslope in windrows or in separate areas. This soil will include rock and vegetation.	Contractor/ CECO	As necessary	-
Shape cut and fill slopes to blend with adjacent landform by rounding off top cut and fill slopes, re-spreading soil and the placement of rocks packed or randomly placed to hold the replaced soil.	Contractor/ CECO	As necessary	-
• No trees or shrubs shall be cut for survey purposes. Offset stations or points shall be set to get around the line of site obstacle.	Contractor/ CECO	As necessary	-

Environmental Specifications	Responsible Individual	Frequency	Method Statement Required
• The installation of concrete pipes and drifts, to facilitate access, shall be at the discretion of the ECO on site. All structures shall be properly designed and drawings shall be available for reference purposes.	Contractor / ECO	As necessary	
• Any dangerous crossings shall be marked as such and where necessary, speed limits shall be enforced.	Contractor	Prior to construction	
(c) Closure of roads			
• Upon completion, only roads as indicated by the SS shall be closed.	Contractor / SS	Upon completion	√
• In areas where no cut or fill has been made, barriers of earth, rocks or other suitable material shall affect closure.	Contractor	Upon completion	
• In areas 30% slope and less, the fill of the road shall be placed back into the roadway using equipment that does not work outside the roadcut (e.g. back-hoe). • In areas of greater that 30% slope, the equipment shall break the road shoulder down so that the slope nearly approximates to the original slope of the ground. • The cut banks shall be pushed down into the road, and a near normal sideslope shall be re-established and revegetated.	Contractor	Upon completion	
• Replacement of earth shall be at slopes less than the normal angle of repose for the soil type involved.	Contractor	As necessary	
• A photographic record of the condition of existing access / private roads to be used shall be made.	Contractor/ CECO	Prior to construction	
• The Contractor shall properly mark all access roads to show the direction of travel (where appropriate). The tower numbers to which the road leads must also be indicated.	Contractor	Prior to construction	
• All roads that are not to be used shall be marked with a **" NO ENTRY "** sign.	Contractor	As necessary	
(d) Water diversion berms			
• Where berms are installed on severe slopes the outflow shall be suitably stone pitched to prevent erosion from starting at the base of the berm.	Contractor / ECO	As necessary	
• Water diversion berms shall be installed from the start of the contract .	Contractor / ECO	As necessary	√
• Water diversion berms shall be spaced according to the ground slope and actual soil conditions, but no greater than the following: o Where the track has a slope of less than 2% : 50m apart o Where the track has a slope of 2% - 10% : 25m apart o Where the track has a slope of 10% - 15% : 20m apart o Where the track has a slope of more than 15% : 10m apart	Contractor / CECO / ECO	As necessary	

Environmental Specifications	Responsible Individual	Frequency	Method Statement Required
• Berms shall be suitably compacted to a minimum height of 350mm.	Contractor / CECO / ECO	As necessary	
• The breadth of the water diversion berm shall be 4m at the base, and extend beyond the width of the road for 2m on the outlet side to prevent water flowing back into the road. It shall be angled to a gradient of 1% to enable the water to drain off slowly.	Contractor / CECO / ECO	As necessary	
• Berms shall be constructed so that a canal is formed at the upslope side.	Contractor / CECO / ECO	As necessary	
• Where the in-situ material is unsuitable for the construction of water diversion berms, alternative methods of construction must be investigated and proposed by the *Contractor* and submitted to the *PM* for acceptance.	Contractor / ECO / PM	As necessary	
• Borrow pits - The *Contractor*'s decision as to the location of borrow pits, shall be at the acceptance of the SS. The *Contractor* shall be responsible for the rehabilitation and revegetation of the borrow pits. It is the *Contractor*'s responsibility to negotiate the royalties for the borrow pits with the landowner. The Contractor shall, in consultation with the ECO, determine whether a permit is required under the Mineral and Petroleum Resources Act 2002 for the use of borrow pits.	Contractor / ECO / SS	As necessary	√
• Where necessary, a suitable mixture of grass seed shall be used to re-seed damaged areas. Badly damaged areas shall be fenced in to enhance rehabilitation. See Section 2.7.22 for the prescribed re-vegetation to be undertaken.	Contractor / CECO / ECO	As necessary	
• The above water diversion berms shall be maintained at all times and be repaired at the end of the contract.	Contractor / CECO / ECO	Upon completion	√
• No roads shall be constructed on slopes of more than 20% unless such roads follow contours. In such areas the Contractor shall only use existing roads or alternative methods of construction. The Contractor shall take such areas into consideration during the tender.	Contractor / CECO / ECO	As necessary	
• Surface runoff water from the road shall be managed by not allowing its concentration. • Provide diversion berms across the road to deflect water to undisturbed vegetated areas as necessary. • The frequency, form and size of the berms will depend on the slope and material available. • Material from the excavation for the foundations shall be used to create the berms where possible. • The excavation of material alongside the road for the berm formation shall not be allowed.	Contractor / CECO / ECO	As necessary	
(e) Levelling at tower sites			
• No leveling at tower sites shall be permitted unless approved by the SS .	Contractor / SS	As necessary	

Environmental Specifications	Responsible Individual	Frequency	Method Statement Required
The steep slopes formed by the cutbanks and respective fillings when building the tower platforms shall be trimmed back to an angle that ensures stability of the slope. When the ground is loose, berms are to be built on the top of the slope, 2m long logs spaced evenly must be pegged across the down-slope and re-vegetated as per Section 2.7.22	Contractor / CECO / ECO	As necessary	
Management objectives • Minimise damage to existing access roads • Minimise damage to environment due to construction of new access roads • Minimise loss of topsoil and erosion	**Measurable targets** • No claims from Landowners due to damage on access roads • No visible erosion on access roads six months after completion of construction • No loss of topsoil due to runoff water on access roads		
2.7.7 Tower positions / construction			
• Disturbance of topsoil on tower sites with severe slopes shall be minimised at all costs.	Contractor / CECO	As necessary	
• Visual degradation by establishing level area for tower assembly may occur. • The *Contractor* shall select a suitable level area free of rock and large bushes for tower assembly. • Cut vegetation (grass and shrubs), if required. No clearing of vegetation or soil by grading machinery shall be undertaken.	Contractor / CECO	As necessary	
• At any tower sites where foundations are installed, the Contractor shall remove the topsoil separately and store it for later use during rehabilitation of such tower sites.	Contractor / CECO	As necessary	
• During backfilling operations, the Contractor shall ensure that topsoil is replaced at the surface.	Contractor / CECO / ECO	As necessary	
• Re-seeding shall be done on disturbed areas as directed by the ECO (Section 2.7.22).	Contractor / ECO	As necessary	
• 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.	Contractor / ECO	As necessary	
• Contour banks shall be spaced according to the slope on tower sites. The type of soil shall also be taken into consideration.	Contractor	As necessary	
• The creation of platforms for towers on sloping landforms must be done in a manner that does not create scars that visually alter the landscape character.	Contractor / ECO	As necessary	
• Cut and fill slopes shall be shaped to blend with the adjacent landform by rounding off the top edge of each.	Contractor / CECO / ECO	As necessary	
• Re-spread stockpiled soil and pack rock on slopes to protect surface against erosion. This shall occur in all instances at the tower foundations.	Contractor / CECO / ECO	As necessary	

Environmental Specifications	Responsible Individual	Frequency	Method Statement Required
• Remove from site all waste concrete. Surplus other material shall be used to create berms in the access road where required.	Contractor / CECO	As necessary	
Management objectives	**Measurable targets**		
• Minimise damage to topsoil and environment at tower positions • Successful rehabilitation of all damaged areas • Prevention of erosion	• 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		
2.7.8 Gate installation and gate control			
• Attention is drawn to the Fencing Act No. 31 of 1963 as amended, in particular with regard to the leaving open of gates and the dropping of fences for crossing purposes, climbing, and wilful damage or removal of fences.	Contractor	Continuous	
• At points where the line crosses any fence in which there is no suitable gate within the extent of the line servitude the Contractor is to, on the SS's instruction, provide and install a servitude gate as detailed in the relevant drawing (See **APPENDIX 7** TRMAGABE1 Rev 0). The Contractor shall mark these crossing points when the tower positions are being pegged.	Contractor	Prior to tower construction	
• Where applicable game gates are to be installed in accordance with the TRMAGABE1 Rev 0 (See **APPENDIX 7**).	Contractor	As necessary	
• All vehicles shall pass through gates when crossing fences, and the Contractor shall not be allowed to drop fences temporarily for the purpose of driving over them. No construction work shall be allowed to commence on any section of line, unless all gates in that section have been installed. Installation of gates in fences on major road reserves shall comply with the ordinances of the relevant Provisional Authority. No gates may be installed in National Road and Railway fences.	Contractor	Prior to construction	
(a) Installation of gates			
• Care shall be taken that the gates shall be so erected that a gap of no more than 100mm to the ground is left below the gate (see **APPENDIX 7** TRMAGABE1 Rev 0).	Contractor	As necessary	
• Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill as shown in TRMAGABE1 Rev 0 (**APPENDIX 7**) shall be provided beneath the gate.	Contractor	As necessary	
• The original tension is to be maintained in the fence wires.	Contractor	Continuous	
• Where required, the *Contractor* shall replace rusted or damaged wire strands on either side of the gate with similar new wiring to prevent the movement of animals. The extent of the replacement shall be on the SS's instruction.	Contractor / SS	As necessary	