



**ENVIRONMENTAL MANAGEMENT
PROGRAMME (EMPR)**

**EMPr for the Construction of new 132 kV
distribution lines substations, a switching- and
substation in the Viljoenskroon and
Vierfontein areas, Moqhaka Local Municipality,
Free State Province**

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Document prepared by:

Aurecon South Africa
4 Daventry Street
Lynnwood Manor
0081

PO Box 74381
Lynnwood Ridge
0040
South Africa

T +27 12 427 2000
F +27 86 556 0521
E tshwane@aurecongroup.com
W www.aurecongroup.com

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Name		Name	
Lynette Herbst		Reuben Heydenrych	
Title		Title	
Junior Environmentalist		EAP	

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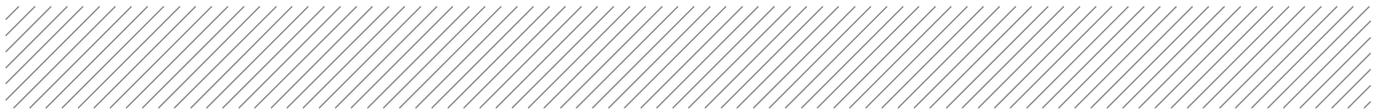
Aurecon Centre
Lynwood Bridge Office Park
4 Daventry Street
Lynwood Manor
0081

T +27 12 427 2000
F +27 86 556 0521
E tshwane@aurecongroup.com
W www.aurecongroup.com



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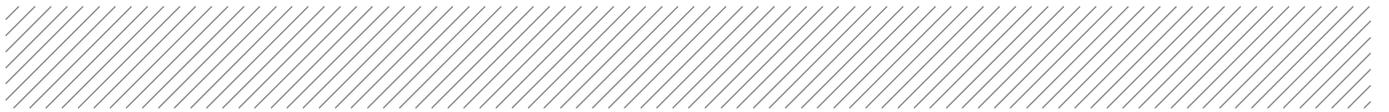
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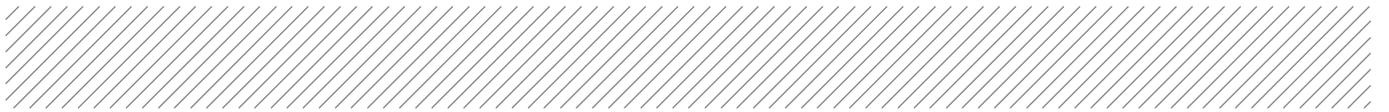
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GLOSSARY OF ABBREVIATIONS

BA	Basic Assessment
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
EO	Environmental Officer



GN	Government Notice
MLM	Moqhaka Local Municipality
NEMA	National Environmental Management Act (No. 107 of 1998)
PM	Project Manager
WULA	Water Use Licence Application



1 UNDERTAKING TO IMPLEMENT THE ENVIRONMENTAL MANAGEMENT PROGRAMME

Undertaking by the Contractor

I,,
....., acting on behalf of the Contractor, hereby indicate that I have read through the Environmental Management Programme (EMPr) and understand the measures required to be implemented in terms of the EMPr. I hereby undertake to implement these measures and carry out my duties as specified herein.

Signed on at

.....
Contractor's Environmental Representative

.....
Witness

.....
Witness

Undertaking by the Environmental Control Officer

I,,
....., the Environmental Control Officer appointed by Eskom, hereby indicate that I have read through the EMPr, and understand the measures required to be implemented in terms of the EMPr and hereby undertake to fulfil my duties as specified herein.

Signed on at

.....
Environmental Control Officer

.....
Witness

.....
Witness



2 CONTEXT AND INSTITUTIONAL MATTERS

This section provides an overview of the proposed project and the purposes of this documents. It also outlines the pieces of legislation applicable to the project and associated authorisations required prior to the commencement of construction activities.

2.1 Background to the Project

Eskom intends to construct and decommission various electricity infrastructure components in the Vierfontein and Viljoenskroon area in the Free State Province.

Aurecon South Africa (Pty) Ltd (“Aurecon”) has been appointed as independent environmental consultants to undertake the required environmental authorisation processes as per the applicable legislation.

In terms of the EIA Regulations of Government Notice (GN) No. 982 of 2014, promulgated under the National Environmental Management Act (No. 107 of 1998) (NEMA), a Basic Assessment (BA) process is required to obtain an Environmental Authorisation (EA) from the Department of Environmental Affairs (DEA). Along with the BA process, a Water Use Licence Application (WULA) process will be undertaken in terms of the National Water Act (Act No. 36 of 1998) for constructing within 500 m of a watercourse.

2.2 Project Locality

The proposed area is situated in the towns of Vierfontein and Viljoenskroon, as indicated in Figure 1. The area lies within the Moqhaka Local Municipality (MLM), under the jurisdiction of the Fezile Dabi District Municipality (WDM) in the Free State Province.

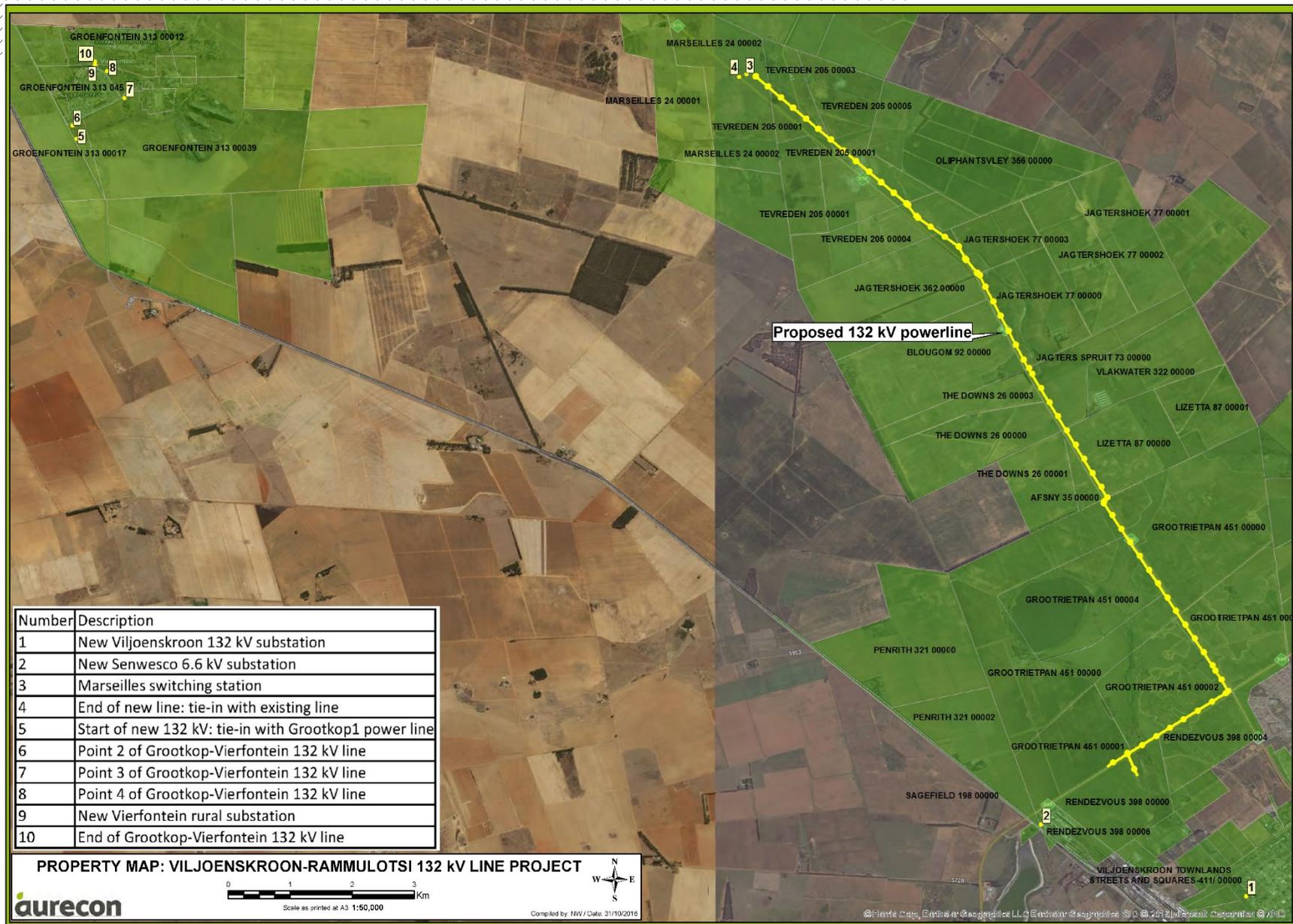


Figure 1: Locality map of the proposed powerline, sub-, and switching stations.

2.3 Purpose of this Document

The purpose of this Environmental Management Programme (EMPr) is to provide measures to ensure legal compliance and guidelines for environmental best practice to the Contractor appointed to construct the proposed distribution line. This document shall be seen as part of the contract and supplementary to tender documentation.

The EMPr is considered a "live" document and should always strive to be applicable to the specific project. Should the need arise to amend any specifications or requirements contained in the EMPr; this must be discussed with the Environmental Control Officer (ECO) for approval. Due to the diverse nature of construction, it is recommended that the EMPr be reviewed annually to ensure its applicability to the project.

The EMPr has a long-term objective to ensure that:

- 1) Environmental management considerations are implemented from the start of the project,
- 2) Precautions against damage and claims arising from damage are taken timeously, and
- 3) The completion date of the contract is not delayed due to problems with neighbouring property owners arising during the course of construction.

Eskom requires a commitment from the Project Manager and Contractors on the following issues:

- 1) Take into consideration the surrounding Landowners as the line traverses private land;
- 2) Always behave professionally on and off site.
- 3) Ensure quality in all work done, technical and environmental.
- 4) Resolve problems and claims arising from damage immediately to ensure an uninterrupted flow of operations.
- 5) To read and understand this EMPr and use it for the benefit of all involved.
- 6) To preserve the natural environment by limiting destructive actions on site.

2.4 Legislative Context

This EMPr has been compiled in terms of the EIA Regulations, which provides a framework for the content and intent of an EMPr. The EMPr also follows the rationale of the ISO 14001: Environmental Management System international standard in that it addresses and differentiates between *Activity, Aspect, Impact, Mitigatory Measures, Performance Indicators, Responsibility, Resources and Time Schedule*.

2.4.1 Applicable Legislation

The following legislation is applicable to the proposed project:

Table 1: Applicable legislation

Title of legislation, policy or guideline:	Administering authority:	Date:
Constitution of South Africa, 1996 (Act No. 108 of 1996)	National Government	1996
National Environmental Management Act (Act No. 107 of 1998)	Department of Environmental Affairs	1998
National Water Act (Act No. 36 of 1998) and regulations	Department of Water and Sanitation (DWS)	1998
National Heritage Resources Act (Act No. 25 of 1999) and regulations	the applicable provincial Heritage Resources Agency	1999
National Environmental Management Biodiversity Act (Act No. 10 of 2004)	Department of Environmental Affairs	2004

2.4.2 Authorisations required

The following environmental authorisations area required prior to commencement of the proposed activities:

Table 2: Requisite environmental authorisation processes

Authorisation/ licence	Applicability	Administering authority:
<u>Environmental Authorisation:</u> through the BA process	<p>Due to the above sensitivities and size of the project's proposed footprint, a basic assessment (BA) process will need to be conducted in order to obtain environmental authorisation according to Listing Notice 1, activity 11 which reads:</p> <p><i>"The development of facilities or infrastructure for the transmission and distribution of electricity-</i> <i>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;"</i></p> <p>And activity 27: <i>"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."</i></p>	DEA
<u>Water Use Licence</u>	<p>In some areas the construction activities will take place within 500m of a watercourse, thus triggering the following activities in terms of the NWA:</p> <ul style="list-style-type: none"> • Section 21(c): Impeding or diverting the flow of water in a water course • Section 21(j): Altering the bed, banks, course or characteristics of a water course 	DWS

3 ROLES AND RESPONSIBILITIES

This section aims to outline the roles and responsibilities of the various parties involved in the construction phase of the project.

3.1 Environmental Control Officer

The ECO is the independent person responsible for monitoring of the implementation of the EMPr and is the liaison person between the project and affected parties. The ECO shall not be appointed by the Contractor, and will report to the project manager appointed by the developer. The ECO has the authority to stop any works if, in his/her opinion, there is or may be a serious threat to or impact on the environment; caused directly by the contractor's actions or activities during the construction phase. In all such work stoppage situations the ECO is to inform the Contractor of the reasons for the stoppage within 24 hours. All ECO reports will be sent on a monthly basis to the project manager to keep abreast of compliance on site.

Upon failure by the Contractor, or its employees, to show adequate consideration to the EMPr, the ECO may recommend to the Contractor to have the Contractor's representative or any employee(s) removed from the site, or work suspended until the matter is resolved.

3.2 Engineer/ Project Manager

The Engineer responsible for the design of the distribution lines will be an Eskom appointment. It will be the responsibility of the Engineer to oversee the overall implementation of the project as well as the compliance of the EMPr and incorporate any potential environmental aspects mentioned into the design.

3.3 Contractor

As part of being responsible for the construction of the proposed distribution line, the Contractor will be responsible for the overall implementation of the EMPr. The Contractor will nominate a representative on site as an environmental representative, known as the Environmental Officer (EO).

The Contractor is also responsible for all sub-contractors and service providers and is to ensure that all persons on site (temporary or permanently) have undergone induction training and are aware of and understand all the EMPr requirements. The EO will monitor the movements of such subcontractors and service providers daily to ensure they comply with the EMPr requirements.

3.4 Environmental Officer

The EO will be responsible, on behalf of the Contractor, to ensure that the EMPr is implemented and complied with on site on a daily basis. The EO will liaise with the ECO (see below) in all matters relating to the implementation of the EMPr. All site non-conformances shall immediately be reported to the ECO. The EO need to be a qualified environmentalist with experience in construction projects and will take responsibility for environmental performance at the site. The EO shall ensure that all employees are aware of all the emergency procedures and EMPr specifications.

3.4.1 Environmental Awareness Training

Prior to construction, all contractor teams involved in work on the project are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMPr. It is recommended that the briefings take the form of an on-site toolbox talks by the EO. The education/awareness programme should be aimed at all levels of management and construction workers within the contractor's team. All new employees arriving on site shall undergo this training. Environmental induction must be done according to the Contractors Environmental Management System, and must include all aspects of the EMPr.

Toolbox talks are to be used as a tool for continuous training of employees and must be conducted on a weekly basis. Toolbox talks must be conducted in an interactive way as to ensure the employees understand the content and purpose of the specific EMPr requirements.

As construction continues, an effort must be made by the Contractor to assess the training needs of workers on site. Cognisance must be given to the specific work to be undertaken at the time and, if necessary, additional training on environmental requirements must be conducted to ensure all workers understand the risks involved as well as how to adequately implement mitigation measures.

An effort to ensure environmental awareness on site must be made at all times during construction.

A signed register documenting all employees' environmental training and awareness programmes must be kept on record.

3.4.2 Record Keeping

The EO is responsible for maintaining all records in relation to the EMPr requirements on site. Such records must be made available to the ECO on request during the monthly audits, as well as at any time as requested by the ECO, regulatory authorities or project managers. Record keeping must be done in an orderly fashion with the intent of ensuring easy reference.

3.5 Organisational and Institutional Matters

Any changes to the EMPr or requirements must be approved by the DEA. Should approval of the proposed changes be granted by the DEA, the project managers will in turn need to communicate this to the property owning entity(ies).

The Contractor shall communicate the final reporting structure to the Project Manager and the ECO for the construction phase of the project. A provisional reporting and communications structure is indicated in Figure 2 below.

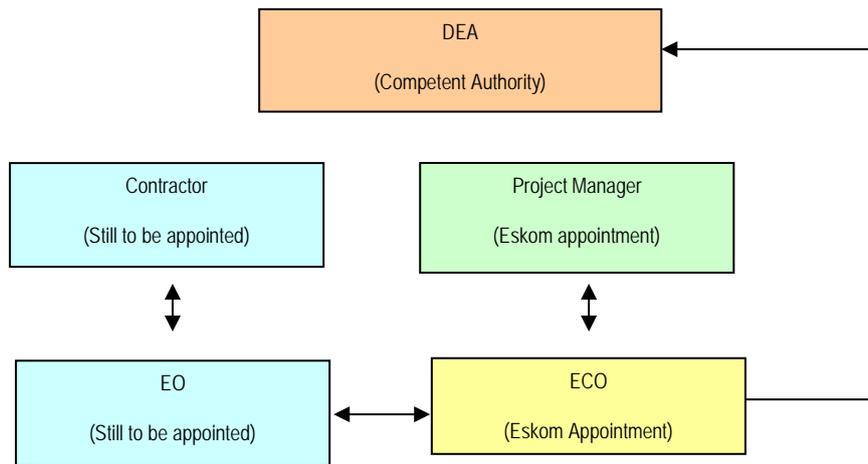


Figure 2: Proposed organisational and reporting structure

3.6 Monitoring and Auditing Framework

3.6.1 Monitoring Programme

The purpose of the monitoring programme is to ensure that mitigation measures identified and described in the EMP are implemented. Construction activities of the new distribution line will be monitored and recorded by the ECO and audited against the EMP on a monthly basis. A report must be submitted at the end of each month prior to the progress meetings where they will form part of the agenda. The ultimate target is to achieve 100 % compliance with the EMP. The ECO is to note and adhere to any additional requirements that may be contained in the conditions of the Environmental Authorisation regarding monitoring and general duties of the ECO.

3.6.2 Penalties

The Contractor will comply with the environmental management requirements of this EMP on an on-going basis, any failure on their part to do so will entitle the Project Manager (PM), in consultation with the ECO to certify the imposition of a fine. The value of the fine will be agreed between the PM and ECO based on the nature, extent and duration of the offence and subsequent environmental damage. Such penalties shall be payable in addition to any remediation costs for correction of environmental damage as a result of non-compliance to this EMP, that will also be for the Contractor's account. Time penalties may also be awarded by the contract's manager where the contractors do not comply. These details are to be included into the contracts.

Note that the following is applicable:

- In terms of the Conventional Penalties Act (1962) a creditor is not entitled to recover both the penalty and damages,
- Accordingly, where a Contractor causes damage, the project manager can either enforce a penalty or make the Contractor make good the damage, but not both.

The Contractor is deemed NOT to have complied with this specification if:

- Within the boundaries of the site, site extensions and access roads there is evidence of contravention of the requirements of the EMPr,
- Environmental damage ensues due to negligence,
- The Contractor fails to comply with corrective or other instructions issued within a specific time,
- The Contractor fails to comply with a site instruction given by the engineer based on the ECO report.
- The Contractor fails to respond adequately to complaints from the public,
- Legal action is instituted against the developer in terms of environmental laws.

Payment of any fines in terms of the contract will not absolve the offender from being liable from prosecution in terms of any law.

4 DESCRIPTION OF ACTIVITIES

This section describes different phases of the project with their associated activities. The section also looks at potential issues/problems that might arise during the different phases of the project and possible ways of mitigation measures.

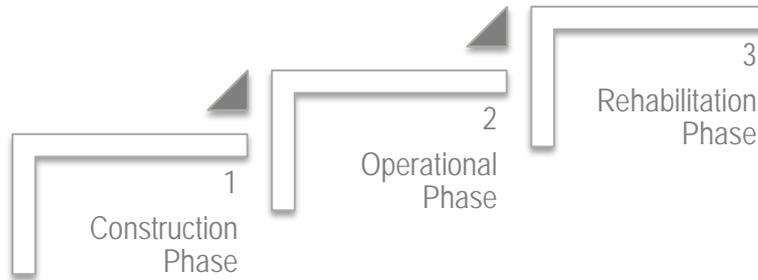


Figure 3: Various phases of the proposed project

4.1 Pre-construction and Construction Phase

4.1.1 Associated Activities

- Clearing vegetation;
- Removal and stockpiling of topsoil;
- Establishment of the contractor's camp;
- Personnel conduct;
- Storage of hazardous material; and
- Handling and disposal of construction waste.

4.1.2 Expected Issues

4.1.2.1 Pre-construction

Affected landowners may perceive construction activities as interference with their daily activities. There is a risk of a negative attitude towards the whole construction process. Landowners are always apprehensive toward changes they do not control.

Possible solutions:

- Proper liaison between Eskom, the Contractor and Landowners.
- Landowners shall therefore be informed timeously of the construction programme, duration and all interference with their daily.

4.1.2.2 *During construction*

Landowners may not be comfortable when strangers gain access to their properties for security reasons. They are likely to look for reasons to interfere with the construction process and may therefore cause delays in the process that can be very costly to Eskom and the Contractor. During construction activities damage to fences, gates and other infrastructure may occur

Possible solutions:

- The Contractor must adhere to all conditions of contract including the EMPr.
- A physical access plan along the servitude shall be compiled and the Contractor shall adhere to this plan at all times. Proper planning when the physical access plan is drawn up by the ECO in conjunction with the Contractor shall be necessary to ensure access to all tower sites.
- 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.
- All damage must be repaired immediately and to the satisfaction of the landowner.
- Where existing private roads are in a bad state of repair, such roads' condition shall be documented before they are used for construction purposes. If necessary some repairs should be done to prevent damage to equipment or property.
- Environmental audits to be carried out on a monthly basis during and upon completion of construction.
- Proper site management and regular monitoring of site works.
- Proper documentation and record keeping of all complaints and actions taken.
- Regular site inspections and good control over the construction process throughout the construction period.

4.2 **Rehabilitation Phase**

4.2.1 **Associated Activities**

- Removal/decommissioning of Contractor's camp;
- Removal of all construction, hazardous and domestic waste; and
- Rehabilitation of the areas disturbed as a result of construction works.

4.2.2 **Expected Issues**

Landowners may not be comfortable when strangers gain access to their properties, for security reasons. Damage to fences, gates and other infrastructure may occur.

Possible solutions:

- The Contractor must adhere to all conditions of contract including the EMPr.
- All damage must be repaired immediately and to the satisfaction of the landowner.
- The Contractor shall not be released from site until the ECO is satisfied that the Contractor has restored the environment to a condition suitable for the Landowner to sign the release form, according to the conditions agreed with the landowner prior to the commencement of construction or decommissioning (whichever is relevant to the particular landowner).

4.3 Operational Phase

4.3.1 Associated Activities

The operation phase will involve inspections, maintenance of the power line and associated infrastructure.

4.3.2 Expected Problems

Landowners may not be comfortable when strangers gain access to their properties for security reasons.

Possible solutions:

- Proper liaison between Eskom, the Contractor and Landowners.
- All damage must be repaired immediately and to the satisfaction of the landowner.
- Maintenance staff need to make prior arrangements with the landowners, to get permission to access the property.

5 IMPACTS AND ASSOCIATED MITIGATION MEASURES

This section details the expected impacts on site during the various phases of the project, as well as the mitigation measures and environmental management procedures required to manage the expected impacts.

Below is the summary of potential environmental issues associated with the proposed activity:

5.1 Section 6: Pre-construction and construction site environmental management

- Health of public and/or landowners;
- Infringement of the EMPr requirements by personnel;
- Water contamination;
- Soil contamination;
- Noise pollution;
- Disturbance of soils due to parking of vehicles outside of designated areas;
- Unpleasant odours on site;
- Inadequate number of latrines on site;
- Unnecessary removal of vegetation;
- Loss of topsoil;
- Safety risks;
- Erosion of topsoil;
- Dust generation;
- Damage or loss of existing vegetation;
- Damage to heritage resources;
- Design incompatible with environment; and
- Potential impacts associated with the closure of the construction camp.

5.2 Section 7: Materials

- Contamination of soil by hazardous materials;
- Inadequate remediation measures for spills;
- Loss of soil fertility;
- Contamination of soil by fuel; and
- Decrease in ambient air quality.

5.3 Section 8: Waste

- Dust during transportation;
- Excessive noise;
- Land pollution (litter);
- Bad odours;
- Decreased aesthetic integrity of the site; and
- Soil pollution.

5.4 Section 9: Surrounding properties

- Damage to access roads;
- Damage to surrounding property infrastructure (gates, fences, etc.)
- Damage to environment; and
- Erosion.

5.5 Section 10: Flora, fauna, air quality, noise, water and other

- Noise pollution;
- Air pollution;
- Avifauna disturbance;
- Loss of avifauna;
- Intentional or unintentional killing of fauna on site;
- Loss of fauna due to habitat disturbance;
- Introduction of alien plants / seeds on site;
- Unnecessary removal of flora;
- Removal of vegetative matter for firewood;
- Damage to existing fences;
- Security risks;
- Interference by vegetation to flow of electricity;
- Erosion due to removal of vegetation;
- Damage to vegetation;
- Damage and erosion to river and stream embankments;
- Siltation of water; and
- Disturbance/loss of topsoil.

5.6 Section 11: Planning and engineering considerations

- Damage to expensive structures and crops;
- Disruption of services;
- Surface water contamination;
- Damage to vegetation;
- Damage to topsoil;
- Erosion; and
- Disruption of services, damage to installations, damage or loss of plant.

5.7 Section 12: Decommissioning

- Damage to structures and property
- Disruption of services

6 PRE-CONSTRUCTION AND CONSTRUCTION SITE ENVIRONMENTAL MANAGEMENT

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
6.1 Engineering Design								
All the aspects listed in the EMPr	Design incompatible with environment	<p>Objective:</p> <p>To ensure the design of the powerlines and stations take the environment into account.</p> <p>Targets:</p> <ul style="list-style-type: none"> Assimilate requirements of the EMPr in the design and construction management, giving special attention to proposed pylon positions within the corridor. 	Design meets environmental objectives as indicated in the BAR and does not degrade the environment	Engineering Design Consultant	Contract and allowance in P&G's	During Tender Design & Design Review Stage	Engineering design consultant	Design Phase
ACTIVITY:								
6.2 Establishment of construction camp sites								
Construction camp establishment	Damage or loss of existing vegetation and changes to the area's water quality	<p>Objective:</p> <p>To minimise negative influence to the surrounding surface and groundwater and existing vegetation.</p> <p>Targets:</p> <ul style="list-style-type: none"> The planning and design for the construction camp must ensure that there is a minimal impact on the environment. The construction camp may not be established before the ECO has approved the location and size of the camp, in writing. The camp must, as far as possible, be placed on already disturbed land. The camp should be fenced off so as to limit the removal of unnecessary vegetation. 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. A method statement is required from the Contractor at tender stage that includes the layout of the camp, management of ablution facilities and wastewater management. The layout plan of the camp must indicate waste storage areas, storage areas of construction materials and hazardous materials as well as placement of ablution facilities. 	Construction camp established in compliance with objectives.	Contractor, EO.	Contract and allowance in P&G's	Pre-construction, Establishment of Site	ECO	Once off

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
		<ul style="list-style-type: none"> The camp shall have the necessary ablution facilities in the form of chemical toilets unless there are existing facilities available. The Contractor shall supply a wastewater management system that will comply with legal requirements and be acceptable to Eskom. The Contractor shall instruct all site staff to make use of ablution facilities supplied. Under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities. The Contractor shall supply waste collection bins. 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. Refuse bins will be secured. All fences removed to facilitate access will be replaced by the contractor once machinery and personnel have been removed from the site to the satisfaction of all the relevant landowners. Emergency numbers and contact numbers of the contractors must be available and prominently displayed on a signage board that is clearly visible at the camp. 						
	Loss of soil fertility	<p>Objective</p> <p>The environmental objective when establishing the contractor's camp is to minimise the footprint of disturbance, thereby preventing the degradation and loss of topsoil.</p> <p>Targets:</p> <ul style="list-style-type: none"> Allowance for one contractor's camp along the alignment. Once the site has been cleared of vegetation, the topsoil should be stripped. Topsoil must be stored in a demarcated area. Soil conservation measures to be put in place to prevent erosion. The area must be rehabilitated once the construction camp has been decommissioned. 	Established construction camp in compliance with objectives and no evidence of environmental degradation	Contractor, EO	Contract and allowance in P&G's	Pre-construction, Establishment of Site	ECO	Once off
ACTIVITY:								
6.3 Closure of the construction camp								
		Objective(s):						Whenever the construction camp is

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Construction camp closure	Potential impacts associated with the closure of the construction camp	To limit potential impacts on the environment for the period for which the construction camp is closed. Targets: Should the construction camp be closed for a period of more than one week, a report on compliance will be lodged with the Contractor, Engineer and Project manager confirming the following:- <ul style="list-style-type: none"> • No persons allowed other than project employees; • Minimal materials are stored; • Materials are stored in leak-proof, sealable containers or packaging; • All storage areas are secured and locked; • Fire extinguishers are serviced and accessible; • The area is secure from accidental damage through vehicle collision, etc.; • Emergency and contact numbers of the contractor are available and prominently displayed; • Chemical toilets are empty, clean and secured; • 24 hour security is on site during this period. 	Closure of the construction camp in line with the requirements of the EMP.	Engineer, Contractor and EO	Contract and allowance in P&G's	Closure of camp	Engineer ECO	closed for longer than a week.
ACTIVITY:								
6.4 Storage of topsoil								
Stripping and stockpiling of topsoil	Mixing of topsoil and subsoil Erosion of topsoil Contamination of top soil; Dust	Objective(s): Topsoil is conserved, maintained and reused. Targets: <ul style="list-style-type: none"> • The topsoil in the specific region is regarded as the top 300 mm (maximum) of the soil profile irrespective of the fertility appearance or physical depth, unless otherwise confirmed by the ECO. • Topsoil is to be stripped up to this depth when it is in as dry a condition as possible in order to prevent compaction. • The topsoil, including the existing grass cover is to be shallowly ripped (only the depth of the topsoil) before removal. This is to ensure that organic plant material, and the natural seed base is included in the stripping process. • Topsoil stockpiles shall not be stored for a period longer than 4 months. • The topsoil stockpiles must not exceed 1.5 m in height. 	No mixing of subsoil and topsoil. Minimal loss of the stockpiled topsoil.	Contractor, EO.	Contract and allowance in P&G's	Pre-construction, Establishment of Site	ECO	Once off

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
		<ul style="list-style-type: none"> Topsoil stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later regrowth of vegetation. The contractor shall apply soil conservation measures to the stockpiles to prevent erosion. This could include the use of erosion control fabric or grass seeding. All grass and other vegetation should be left on the topsoil stockpiles so that they colonize the area after construction. Photographic record must be kept of the topsoil stockpiles. Dust and erosion of topsoil from runoff must be minimised through appropriate watering and the avoidance of transporting and placing of topsoil in areas exposed to high wind or excessively rainy conditions. The contractor shall devise a soil conservation and stockpiling plan, to be approved by the ECO and Engineer, which shall detail:- <ul style="list-style-type: none"> Stockpile sizes, layout and form; Means of erosion (wind and water) prevention for stockpiles; The rehabilitation measures to be taken for the area occupied by the temporary stockpile; A generic schedule of soil replacement for areas where work has been completed. Soil replacement should preferably run in parallel (where feasible) with the construction process; Soil erosion prevention measures for general site use. Alien vegetation growing on stockpiles must be eradicated. Herbicides shall not be used to remove alien vegetation unless approved by the ECO. No pesticides may be used. 						
ACTIVITY: 6.5 Construction of site buildings								
	Soil pollution and permanent	Objective(s): To minimise the impacts of the construction of the buildings on the environment and ensure the material for site buildings are recyclable. Targets: <ul style="list-style-type: none"> No permanent structures will be permitted at the contractor's camp. 	On site buildings constructed according to					

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Buildings materials	alteration to the natural environment	<ul style="list-style-type: none"> Temporary structures shall be founded on a platform, either subsoil or screed slab. Buildings should preferably be pre-fabricated or constructed of re-usable/recyclable materials. All temporary structures must be soundly built and not pose a danger to workers. Containers are to be used for the storage of materials which have the potential to release pollutants into the environment. All structure footprints to be rehabilitated and re-vegetated after construction is complete. 	the requirements of the EMPr.	Contractor and EO.	Contract and allowance in P&G's	Pre-construction, Establishment of site.	ECO	Once off
ACTIVITY:								
6.6 Fencing of the construction sites that will be affected by the proposed project								
Demarcation of the site	Unnecessary removal of vegetation Loss of topsoil Safety risks	Objective(s); Whilst establishing the site, the footprint of disturbance must be minimised and the extent of soil erosion, loss of vegetation and the potential for the pollution of soils must be prevented. Targets: <ul style="list-style-type: none"> All excavations must be demarcated using danger tape with steel droppers or other methods as approved by the ECO. The width of the construction footprint must be agreed upon by the ECO and the Engineer and as far as possible must be kept to a minimum. No personnel or construction materials will be allowed to move outside the designated/demarcated site during construction activities. Do not perform any activities or operations that are likely to adversely affect the aesthetic quality of the environment. Fences and security access must be maintained throughout the project. 	The site is demarcated according to the requirements of this section of the EMPr.	Contractor and EO	Contract and allowance in P&G's	Construction sites must be fenced off along the alignment before site clearance.	Engineer, ECO.	As construction proceeds along the alignment.
ACTIVITY:								
6.7 Cooking of food								
		Objective(s): To ensure that the cooking facilities used on site do not pose risks to the environment.						

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Cooking	Type and placement of cooking facilities used, and how they will be used	Targets: <ul style="list-style-type: none"> The contractor must supply gas and /or electricity cooking facilities for the labourers at the construction camp if required. No fires are allowed to be lit on site. 	Evidence of presence of gas and /or electricity cooking facilities where required.	Contractor.	Contract and allowance in P&G's	Pre-construction, Establishment of site.	ECO	During ECO audits.
ACTIVITY								
6.8 Operation of the sanitation system(s)								
Sanitation systems	Unpleasant odours on site Inadequate number of latrines on site Position of latrines and shower systems Bad management of waste water Possible contamination / pollution of watercourses	Objective(s): To ensure good sanitation system and management throughout the construction period. Targets: <ul style="list-style-type: none"> Adequate chemical toilets must be provided for all staff. Alternatively, existing ablation facilities on site can be utilised if available and authorised by the owner. Chemical toilets must be emptied / serviced on a regular basis to prevent them overflowing. Proof of this must be provided to the ECO. Toilets shall not be placed in or next to watercourses. A minimum of one toilet must be provided per 11 persons at each working area within 100 m from worker activity. Where shower facilities are provided for use by staff the following must be imposed:- <ul style="list-style-type: none"> Positioning of the showers, specifically the discharge point , must be placed in a way to ensure that erosion and build-up of detergents does not occur; All discharge from the shower and other washing facilities must pass through a suitable filter to reduce the load of detergents to the environment; Use of the shower facilities must be limited to staff or authorised persons only. 	Adequate toilets and showers will be positioned at the right places as per the EMPr and ECO. Absence of odours, erosion and build-up of detergents.	Contractor	Contract and allowance in P&G's	Pre-construction, Establishment of site.	ECO	Weekly

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
6.9 Vehicle parking area and storage of equipment.								
Vehicle parking and parking area(s) Storage of equipment	Pollution of soils Disturbance of soils due to parking of vehicles outside of designated areas	<p>Objective(s):</p> <p>To ensure vehicles are parked according to the specifications in the EMPr and that equipment is handled appropriately.</p> <p>Target:</p> <ul style="list-style-type: none"> No storage of vehicles or equipment will be allowed outside of the designated area. Drip trays or any form of oil absorbent material must be placed underneath vehicles and equipment when not in use. 	<p>Drip trays must be provided and placed under vehicles and equipment which are not being utilised on site.</p> <p>Vehicles and equipment not stored outside demarcated area.</p>	Contractor and EO	Contract and allowance in P&G's	Throughout the construction period.	ECO	Whenever there are stationary vehicles or equipment present on site.
ACTIVITY:								
6.10 Servicing and washing of vehicles and machinery								
Workshop and equipment storage areas	Water contamination Soil contamination Noise pollution	<p>Objective(s):</p> <p>To ensure that the environment is not polluted by ensuring that service areas and wash bays for vehicles and machinery are made available and utilised.</p> <p>Targets:</p> <ul style="list-style-type: none"> Where possible and practical all maintenance of vehicles and equipment shall take place in a workshop area. During servicing of vehicles or equipment, a suitable drip tray shall be used to prevent spills onto the soil. Should emergency repairs be necessary outside of the designated area, drip trays or tarpaulins must be utilised to ensure the collection of the oil. The area for emergency repairs should be identified by ECO. 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 an appropriate registered waste site. 	Evidence of prescribed servicing and washing services.	Contractor, EO.	Contract and allowance in P&G's	During construction.	ECO	Whenever servicing or maintaining of vehicles or equipment throughout the construction period.

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
		<ul style="list-style-type: none"> 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. A method statement is required from the Contractor detailing possible emergencies that can occur, such as fire and accidental leaks and spillage and how these emergencies will be dealt with. The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site. The contractor must ensure that delivery drivers and plant operators are informed of all relevant procedures and restrictions required ensuring compliance with this document. Proof of this must be filed on site. All vehicles and equipment must be well maintained to ensure that there are no oil or fuel leakages. The following shall apply: <ul style="list-style-type: none"> All contaminated soil / yard stone shall be removed and be placed in containers for further disposal; Contaminated material can be taken to one central point where bio-remediation can be done; Smaller spills can be treated on site; A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site; and All major spills of hazardous substances must be reported to the ECO and relevant authorities. 						
ACTIVITY:								
6.11 Personnel conduct								
Personnel conduct	Infringement of the EMPr requirements by personnel	<p>Objective(s):</p> <p>To ensure that personnel are adhering to the EMPr requirements.</p> <p>Target:</p> <ul style="list-style-type: none"> The Contractor will adhere to all requirements of the Occupational Health and Safety Act (Act 56 of 2004), including the drafting of a suitable Health and Safety Plan which will be implemented during the construction phase. All personnel to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Eskom induction must be attended by all parties involved in the construction. Proof of this must be filed on site. Weekly toolbox talks on aspects of the EMPr shall be held. 	<p>Personnel wearing proper safety uniform.</p> <p>Absence of trespassers on site.</p>	Contractor and labourers.	Contract and allowance in P&G's	All phases of the project.	ECO	Throughout construction period.

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
		<ul style="list-style-type: none"> Copies of toolbox talks undertaken as well as signed registers of attendance must be filed on site. Labourers associated with the contractor must be easily recognizable (i.e. company issued overalls with company name/logo etc.), and other persons will not be allowed within the construction camp at any time without prior permission from the project manager. The Contractor shall take all necessary precautions against trespassing on private properties. Warning signs must be placed on and around the site as per the Occupational, Health and Safety requirements. Adequate first aid services must be provided by the contractor at the contractor's camp. The contractor will be responsible for his own security arrangements and shall comply will all site security instructions. Basic firefighting equipment must be available on site. Ensure that firefighting equipment is working and recently serviced. PPE to be provided and well maintained at contractor's camp. All incidents should be reported to ECO, investigated, documented and kept in safety file. 						
ACTIVITY:								
6.12 Construction activities								
Use of machinery and plant that can cause injury	Injuries to public and/or landowners	<p>Objective(s):</p> <p>To ensure that the Public at large is not injured or affected negatively in any way.</p> <p>Target:</p> <ul style="list-style-type: none"> The Contractor shall recognise that the sites are situated close to inhabited and agricultural areas and shall therefore take all reasonable measures to ensure the safety of people in the surrounding area. Where the public could be exposed to danger by any of the works or site activities, the Contractor shall provide suitable flagmen, barriers and/ or warning signs in English and Afrikaans all to the approval of the Project Manager. All unattended open excavations shall be adequately demarcated. 	<p>No injuries or health consequences to neighbouring people.</p> <p>No complaints from neighbouring people.</p>	Contractor and EO	Contract and allowance in P&G's	Throughout the construction period.	ECO	Throughout construction period.
Use of construction vehicles on public and private roads	Health of public and/or landowners							

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
	Damage to heritage resources	<ul style="list-style-type: none"> Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding. No firearms shall be permitted on Site without the prior approval of the Project Manager. If positions of the pylons cannot avoid the respective historical structures, a buffer of at least a 20 m from the historical structures must be implemented during the construction phase and maintained during the operational and decommissioning phases of the project. If the sites are still to be affected by the proposed development, a mitigation permit is required from SAHRA (section 34 and 35 of the NHRA). Once received, the structures will have to be documented through mapping and excavations (after a mitigation permit is obtained from SAHRA). Thereafter, a destruction permit is required from SAHRA (section 34 and 35 of the NHRA). A finds management protocol shall be developed for construction activities should stone tools be encountered during pre-construction and construction activities. 						

7 MATERIALS

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
7.1 Transportation of material								
Material transport	Traffic congestion	<p>Objective(s)</p> <p>To ensure that whilst material is transported, it cannot be of negative influence to the surrounding environment.</p> <p>Targets:</p> <ul style="list-style-type: none"> The contractor should note that there are existing roads in places which are sufficient to facilitate access to the sites, however the following should be adhered to: <ul style="list-style-type: none"> Access to privately owned land will be arranged with the various landowners along the alignment by the contractor. Adequate and appropriate traffic warning signage must be erected along transport routes and access roads where applicable. The Contractor shall take preventative measures e.g. screening, muffling, timing, pre-notification of affected parties to minimise complaints regarding noise and vibration nuisance from sources. Fine materials (such as sand) must be covered during transportation. Appropriate response plans must be prepared by Contractors to ensure the fastest possible reaction to spills or accidents. All trucks and vehicles removing spoil from the site must have load areas and must be covered by a tarpaulin (plastic/synthetic sheets/covers) to prevent rocks and spoil falling onto the road surfaces. Vehicle speeds on site should not exceed 40km/hr on site. All drivers and operators are to have licences for driving and moving of plant on site. All road vehicles to be roadworthy. 	Mufflers and silencers fitted to construction vehicles and equipment.	Contractor and EO	Contract and allowance in P&G's	Prior to construction start.	ECO	Throughout construction period or as required by the ECO.
	Dust during transportation	<ul style="list-style-type: none"> Covering of material during transportation. 						
	Excessive noise	<ul style="list-style-type: none"> Emergency reaction plan (for spills/accidents) must always be readily available on site. 						

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
7.2 Storage of hazardous material								
Hazardous Material storage areas	Contamination of soil by hazardous materials Inadequate remediation measures for spills	<p>Objective(s):</p> <p>To ensure adequate protection of soil and soil remediation measures in case of spills.</p> <p>Targets:</p> <ul style="list-style-type: none"> Hazardous materials – such as paint, cement, fuels, bitumen, oil, herbicides, battery acid or detergents – must be stored in sealed, lockable containers when not in use. A register shall be kept on all substances and be available for inspection at all times. Storage areas shall be monitored for spills and any spills shall be contained, cleaned and rehabilitated immediately. Drip trays shall be used when decanting hazardous substances. No decantation into unmarked containers. No decanted fuel to be left unattended in the sun to avoid fire. When handling hazardous materials, manufacturer's specifications must be complied with. The 16 point Material Safety Data Sheet for all hazardous materials kept on site must be available. All reasonable care must be taken to prevent spills of any hazardous material when in use. All spills (minor and major) must be cleaned and remediated to the satisfaction of the ECO and EO within 24 hours of occurrence. The contractor must ensure that there is a supply of absorbent material (e.g. Drizit) and clean-up materials readily available to absorb, breakdown and, where possible, encapsulate minor hazardous material spillages. No material may be stacked higher than 2 m. All products are to be stored with compatibility in mind. Storage areas shall display the required safety signs depicting "No smoking", "No naked lights" and "Danger". Containers shall be clearly marked to indicate contents as well as safety requirements. 	<p>Storage of hazardous materials in sealed and lockable containers.</p> <p>No evidence of spills on site.</p> <p>Absorbent and clean-up material readily available on site.</p>	Contractor and EO.	Contract and allowance in P&G's	Construction period	ECO	For the duration of the construction period dependent on the presence of hazardous material on site.

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
		<ul style="list-style-type: none"> The contractor shall supply a method statement to the engineer for approval for the storage of hazardous materials prior to site preparation works. 						
ACTIVITY:								
7.3 Storage of fuel								
Storage areas	Contamination of soil by fuel Inadequate remediation measures for spills	<p>Objective(s):</p> <p>To ensure that there is optimum environmental protection (especially soil) from fuel spills.</p> <p>Targets:</p> <ul style="list-style-type: none"> Fuel must be stored in above ground storage tanks or sealed containers, contained within a bunded area with sump drainage. All bunds must be designed to contain at least 110% of the tank or drum storage capacity (this shall apply to above ground storage, and include fuels, welding equipment and oxy-acetylene cutting equipment). No drainage from fuel storage areas shall be permitted. Any other hazardous substances stored in bulk will require bunding. 	Established fuel storage areas in compliance with the objectives of the EMPr.	Contractor and EO	Contract and allowance in P&G's	Pre-construction, Establishment of site.	ECO	Throughout construction period or as required by the ECO.

8 WASTE

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
8.1 Storage, removal and disposal of construction waste								
Domestic waste	Land pollution Unpleasant odours Decreased aesthetic integrity of the site	<p>Objective(s)</p> <p>To ensure that waste is correctly stored and disposed of, decreasing the visual and possible environmental impact during the construction and post construction period.</p> <p>Targets:</p> <ul style="list-style-type: none"> The Contractor must supply sealable waste bins at the construction camp for the storage of domestic waste. Waste gathered at working areas must be disposed of in the waste bins at the construction camp at the end of each day. Personnel must be informed about the necessity of using the waste drums. The Contractor must do site clean-ups of litter on a daily basis, and dispose of it in the designated waste bins provided at the Contractor's Camp. The contractor must ensure that general site-wide litter clean-up will occur at least once a week. The Contractor must dispose of all domestic refuse generated by his staff and Sub-Contractors on a weekly basis at a registered waste disposal facility. The Contractor must provide proof of this to the ECO in the form of a disposal certificate. Grey water must be stored in sealable marked containers and disposed of with other waste water from the construction works. 	Evidence of domestic waste stored, removed and disposed of according to the requirements indicated in this EMPr.	Contractor and EO	Contract and allowance in P&G's	The waste bins/skips must be available prior to construction. Removal of waste throughout the construction period.	ECO	<p>Throughout construction period.</p> <p>Domestic waste shall not be stored on site for longer than 30 days. Weekly removal is recommended. Waste bins shall not be left to overflow but shall be removed from site and disposed of at a registered landfill site regularly enough.</p> <p>Daily litter clean-ups.</p> <p>Weekly site-wide clean-up of all waste types.</p>
ACTIVITY:								
8.3 Storage, removal and disposal of hazardous waste								
Generation of hazardous waste	Soil pollution	<p>Objective(s):</p> <p>To ensure that soil and the rest of the surrounding environment on site is protected from hazardous waste.</p>	All mitigation measures with regards to Hazardous	Contractor and EO	Contract and allowance in P&G's	Hazardous wastes must be collected	ECO	Hazardous waste may not be stored on site for longer than 90 days.

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
		<p>Targets:</p> <ul style="list-style-type: none"> The Contractor is required to refer to the Hazardous Substances Act No 15 of 1973 act to determine whether any substance (new or waste) stored on site is subject to controls contained within the act. All hazardous waste must be stored in sealed and suitably marked containers for removal to a registered hazardous waste disposal facility. Any oil spillage on site will be excavated to a depth determined between the EO and ECO and disposed of for removal to a registered hazardous waste disposal site. Excavated areas are to be refilled with suitable replacement material. Alternative <i>in-situ</i> remediation techniques could be used, if approved by the ECO. 	waste mentioned in the EMPr are implemented.			<p>in sealable, safe containers.</p> <p>Removal of hazardous waste throughout the construction process.</p>		

9 SURROUNDING PROPERTIES

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
9.1 Entering different properties								
Use and maintenance of access roads	Damage to access roads	<p>Objective(s):</p> <p>To minimise damage to existing access roads. To minimise damage to the environment due to construction of new access roads. To minimise loss of topsoil and erosion.</p> <p>Targets:</p> <ul style="list-style-type: none"> No new access roads shall be constructed as adequate access to site exists. Planning of access routes must be done in conjunction between the Contractor, ECO, Engineer and applicable Landowners. All agreements reached should be documented. No verbal agreements should be made. The Contractor shall properly mark all access roads. Roads not to be used shall be marked with a "NO ENTRY" sign. Where necessary, a suitable mixture of grass seed shall be used to re-seed damaged areas. Deteriorated areas shall be fenced off to enhance rehabilitation. 	No claims from Landowners due to further damage on existing access roads.	Contractor and EO	Contract and allowance in P&G's	During the establishment of the construction site	ECO	Once off or as required during construction
	Damage to environment	<ul style="list-style-type: none"> No erosion visible on access roads three months after completion of construction. 	No erosion visible on access roads three months after completion of construction.					
	Loss of topsoil	<ul style="list-style-type: none"> No loss of topsoil due to run-off water on access roads. 	No loss of topsoil due to run-off water on access roads.					
	Erosion							

10 FLORA, FAUNA, AIR QUALITY, NOISE, WATER AND OTHER

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
10.1 Construction activities (Physical issues and their control)								
Earthmoving activities	Scarring of soil surface Disturbance/loss of topsoil	<p>Objective(s):</p> <p>Minimise scarring of the soil surface and land features. Minimise disturbance and loss of topsoil. Rehabilitate all disturbed areas along the servitude.</p> <p>Target:</p> <ul style="list-style-type: none"> Topsoil to be stripped to 300 mm where required by ECO. Topsoil only to be stripped where absolutely necessary. The areas within and around the servitude will most likely be disturbed by construction activities and rehabilitation is required to reinstate such areas. 	<p>No visible erosion scars once construction is completed.</p> <p>Minimum loss of topsoil at any one site.</p> <p>No barren areas visible three months after construction is completed.</p> <p>All damaged areas successfully rehabilitated.</p>	Contractor and EO	Contract and allowance in P&G's	During the establishment of the construction sites along the alignment	ECO	Vegetation will be cleared as construction proceeds along the alignment
Construction within or adjacent to wetlands	Damage and erosion to wetlands Siltation Compaction	<p>Objective(s):</p> <p>Minimise damage to wetlands. Avoid contamination of water. Limit soil erosion in wetland areas.</p> <p>Targets:</p> <ul style="list-style-type: none"> Care should be taken to position the pylons outside aquatic habitat, although this may not be possible across the entire route. All conditions as stipulated in the Water Use Licence shall be adhered to during construction. It is recommended that concrete foundations are constructed level with the soil surface to enable surface water flow over the foundations. Alternatively, pylons should be situated out of wetland areas altogether, where possible. Construction should, where possible, take place during the dry season, to avoid soil compaction. 	<p>No access roads through river and stream banks</p> <p>No visible erosion scars on embankments once construction is completed</p> <p>Water Use License</p>	Contractor, EO ECO	Contract and allowance in P&G's	During construction of pylons in close proximity to river	ECO	During construction
ACTIVITY:								

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
10.2 Vegetation clearing								
General construction activities	Damage to vegetation	<p>Objective(s):</p> <p>Minimise damage to vegetation. Keep the servitude as natural-looking as possible. Minimise the potential interference of vegetation to the 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 species.</p> <p>Targets:</p> <ul style="list-style-type: none"> The objective of vegetation clearing is to trim, cut or clear the minimum number of trees and vegetation necessary for the safe mechanical construction and electrical operation of the distribution line. Only an 8 m strip may be cleared flush with the ground to allow vehicular passage. No scalping shall be allowed on any part of the servitude road unless absolutely necessary. Permits from the Department of Forestry will be attained where necessary and 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 local villages for further use. 	No vegetation removed unnecessarily	Contractor and EO	Contract and allowance in P&G's	During the establishment of the construction sites along the alignment	ECO	Vegetation will be cleared as construction proceeds
Earthmoving activities	Interference by vegetation to flow of electricity	<ul style="list-style-type: none"> No de-stumping shall be allowed on any part of the servitude road unless absolutely necessary. 	No vegetation interfering with structures and statutory distances upon completion of the contract					
	Erosion due to removal of vegetation	<ul style="list-style-type: none"> Vegetation clearing on tower sites 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 on a tower site shall be removed or flattened and not be pushed to form an embankment around the tower. No vegetation clearing in the form of de-stumping, scalping or uprooting shall be allowed. Vegetation shall only be cut to allow for the passage of the pilot-cables and headboard. No vegetation clearing shall be allowed across ravines and gullies, as this vegetation will very rarely interfere with the 	<p>No de-stumping of vegetation on river and stream embankments</p> <p>No visible erosion scars three months after completion of the contract due to vegetation removal</p> <p>No visible damage to the vegetation along the servitude one year after completion of the contract due to herbicide use</p>					

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
		<p>clearance to the strung conductor. Trees and vegetation not interfering with the statutory clearance to the conductors can be left under the line. Dense vegetation under the line which could cause a fire hazard, particularly in the middle third of the span in the vicinity of the lowest point of the conductors, will be considered as a separate case.</p> <ul style="list-style-type: none"> 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. The use of herbicides shall only be allowed after a proper investigation into the necessity, the type to be used, the long-term effects and the effectiveness of the agent. ECO's approval for the use of herbicides is mandatory. Application shall be under the direct supervision of a qualified technician. All surplus herbicide shall be disposed of in accordance with the supplier's specifications. 	<p>No litigation due to unauthorised removal of vegetation.</p> <p>All alien invaders eradicated from the servitude</p>					
ACTIVITY:								
10.3 Gate installation and control								
Gate installation and control	<p>Damage to existing fences</p> <p>Security risks</p>	<p>Objective(s):</p> <p>Properly install gates to allow access to the servitude. To minimise damage to fences, limit access of Eskom- and Contractor personnel with gate keys. To minimise the extent of removal of vegetation.</p> <p>Targets:</p> <ul style="list-style-type: none"> 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. 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 until construction is completed. 	<p>No transgressions of the Fencing Act.</p> <p>No damage to fences and subsequent complaints from Landowners.</p> <p>All gates equipped with locks and kept locked at all times to limit access to key holders.</p>	Contractor and EO.	Contract and allowance in P&G's	During the establishment of the construction sites along the alignment.	ECO	During construction

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
			<p>All fences properly tied off to the gate posts.</p> <p>All gates properly and neatly installed according to specifications.</p> <p>No complaints about open gates.</p>					
ACTIVITY:								
10.4 Removal of vegetation								
General construction activities	Unnecessary removal of flora	<p>Objective(s):</p> <p>To minimise the extent of removal of vegetation.</p> <p>Targets:</p> <ul style="list-style-type: none"> Vegetation outside of the construction area are not to be disturbed, destroyed or removed. The Contractor will be held liable for the replacement of any plant or feature under the protection of these specifications that is removed or damaged by the Contractor's negligence or mismanagement. No open fires permitted near trees. No material storage or lay down is permitted under trees. All woody material not donated to local villages is to be chipped and used on site for rehabilitation. 	No unnecessary loss of vegetation.	Contractor and EO.	Contract and allowance in P&G's	During the establishment of the construction sites along the alignment.	ECO	During construction

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
10.5 General construction activities								
Soil disturbance Bringing propagules of invasive plants onto site	Introduction of alien plants/ seeds on site	<p>Objective(s):</p> <p>To prevent alien plants/ seeds from being introduced on site.</p> <p>To remove alien plants from site, where possible</p> <p>Targets:</p> <ul style="list-style-type: none"> The Contractor should train the labourers on the removal and disposal of alien vegetation. All sites disturbed by construction activities must be monitored for exotic or invasive plant species and weeds. Chemical removal shall be used in accordance with manufacturer's specification for weeds. The type of chemical to be utilised must be approved by the ECO. Any eradicated exotic/invasive plant or weed vegetation must be removed from site and disposed of at an approved waste disposal facility. Operator must have Pest Control Operators licence. A maintenance schedule is to be provided after reinstatement is completed to ensure that alien vegetation is prevented from using the disturbed alignment as a corridor. Eskom will be responsible for the implementation of the maintenance schedule. 	Decrease of alien plants on site	Contractor, Labourers, EO	Contract and allowance in P&G's	For the duration of the construction period	ECO	During construction
All activities that have the potential to interact with fauna	Intentional or unintentional killing of fauna on site Loss of fauna due to habitat disturbance	<p>Objective(s):</p> <p>To ensure that fauna found on site are protected and not interfered with.</p> <p>Targets:</p> <ul style="list-style-type: none"> The contractor must ensure that the site is kept clean and free of rubbish that could potentially attract animal pests, and that rubbish bins are scavenger proof. All contractors and employees will be made aware of the restrictions on collecting / harvesting fauna and flora from the veld for consumption / medicinal purposes. The contractor must report problem animals or vermin to the ECO. The presence of any rare or protected fauna species will be continually monitored. If any rare or protected species are 	No evidence of domestic animals on site. The site is kept clean and does not attract fauna.	Contractor, EO.	Contract and allowance in P&G's	Throughout the construction and post construction period.	ECO	During construction

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
		<p>observed, they will be recorded, reported and relocated under the correct permit.</p> <ul style="list-style-type: none"> • Ensure that domesticated and livestock animals belonging to the local community are kept away from the construction works. • The contractor may under no circumstances make use of pesticide or poison to control unwanted animals. • Workers should be educated so as not to kill any fauna found onsite. • The footprint of disturbance should be kept to a minimum. • No hunting or trapping is permitted along the alignment. • Access roads should be planned so that only minimum linear distances are developed. • Excavations must be checked on a daily basis for any signs of wildlife which may have fallen in. 						
General construction activities that can interact with birds	<p>Avifauna disturbance</p> <p>Loss of avifauna</p>	<p>Objective(s):</p> <p>To minimise disturbance of animals. To minimise interruption of breeding patterns of birds.</p> <p>Targets:</p> <ul style="list-style-type: none"> • The breeding sites of wild bird species shall be taken into consideration during the planning of the construction programme • It is imperative that the breeding sites of birds are kept intact and that the breeding pairs are not disturbed especially where there are young nestlings • Should any new sites or nests be found during the construction process, that was not known or have been noted before, each site shall be assessed for merit and the necessary precautions be taken to ensure the least disturbance • Bird guards and diverters shall be installed, as per the recommendations of the site specific recommendations. • Anti-collision devices should be installed on power lines that cross corridors, rivers, wetlands and ridges. 	<p>No complaints from Landowners or Nature Conservation.</p> <p>No litigation concerning stock losses and animal deaths</p>	Contractor, EO.	Contract and allowance in P&G's	Sites should be assessed pre-construction and continuously throughout construction	ECO	During construction
<p>ACTIVITY:</p> <p>10.6 Trenching</p>								

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Presence of exposed soil in open trenches and on access roads Movement of vehicles over exposed soil and on roads	Air pollution	<p>Objective(s): To reduce the generation of dust on the construction site.</p> <p>Targets:</p> <ul style="list-style-type: none"> Dust suppression is to be conducted during construction or as complaints are received. All soil stockpiles should be covered with hessian or sprayed with water. Warning barricading should be placed around open trenches and should be suitable for high winds so that it is not blown away. The Contractor is to take appropriate measures to minimise the generation of dust as a result of excavation works. Such measures include frequent spraying during low rainfall periods. Speed limits must be enforced in all areas to reduce the generation of dust. 	<p>Dust is kept at its possible lowest level on site.</p> <p>No complaints received from landowners.</p>	Contractor and EO.	Contract and allowance in P&G's	Throughout construction period.	ECO	During periods of low rainfall or as required by the ECO
ACTIVITY:								
10.7 Use of construction vehicles and equipment								
Movement of construction vehicles, plant and machinery	Noise and vibration	<p>Objective(s): Maintaining noise levels within legal requirements</p> <p>Targets:</p> <ul style="list-style-type: none"> Should construction have to continue after hours, all affected residents must be notified in writing, well in advance of such activities. All machinery and equipment must be maintained in good working order, and fitted with approved and specified muffler systems. 	<p>Construction vehicles and machinery fitted with mufflers silencers.</p> <p>Working hours are adhered to.</p>	Contractor and EO.	Contract and allowance in P&G's	<p>The vehicles and machinery must be fitted with mufflers prior to the commencement of construction.</p> <p>Work hours, unless otherwise permitted, must be adhered to through the construction period.</p>	ECO	Ongoing

11 PLANNING AND ENGINEERING CONSIDERATIONS

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
11.1 General construction activities								
Potential disturbance of existing infrastructure	Disruption of services, damage to installations, damage or loss of plant	<p>Objective(s):</p> <p>To have control and prevent over temporary or permanent damage to plant and installations. To prevent interference with the normal operation of plant and installations. Securing of the safe use of infrastructure, plant and installations have control over actions and activities in close proximity to inhabited areas.</p> <p>Targets:</p> <ul style="list-style-type: none"> • Telephone lines shall not be dropped during the stringing operations. • Where pipelines are found along the route, the depth of the pipes under the surface shall be determined to ensure that proper protection is afforded to such structures. • Any damage to pipelines shall be repaired immediately. • 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 directly damaged by construction activities shall be repaired to their original state. • Power cuts to facilitate construction, especially stringing, must be carefully planned. If possible, disruptions must be kept to a minimum and should be well advertised and communicated to the Landowners. 	<p>No unplanned disruptions of services.</p> <p>No damage to any plant or installations.</p> <p>No complaints from authorities or Landowners regarding disruption of services.</p> <p>No litigation due to losses of plant, installations and crops.</p>	Contractor, EO.	Contract and allowance in P&G's	For the duration of the construction period.	ECO	During construction
ACTIVITY:								
11.2 Pylon site selection								

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Tower positions	Damage to topsoil Erosion	<p>Objective(s):</p> <p>To minimise damage to topsoil and environment at tower positions. Successful rehabilitation of all damaged areas. Prevention of erosion.</p> <p>Targets:</p> <ul style="list-style-type: none"> Disturbance of topsoil on tower sites with severe slopes shall be minimised at all costs. At any tower sites where conventional foundations are installed, the Contractor shall remove the topsoil separately and store it for later use during rehabilitation of such tower sites. During backfilling operations, the Contractor shall take care not to dump the topsoil in the bottom of the foundation and then put spoil on top of that. Re-seeding shall be done on disturbed areas as directed by the ECO. In accordance with the Conservation of Agricultural Resources Act, No 43 of 1983, 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. A mixture of grass seed can be used provided the mixture is carefully selected to ensure the following: <ul style="list-style-type: none"> Annual and perennial grasses are chosen; Pioneer species are included; All the grasses shall not be edible; Species chosen will grow in the area without many problems; Root systems must have a binding effect on the soil; and The final product should not cause an ecological imbalance in the area To get the best results in a specific area, consult with a specialist or the local extension officer of the Department of Agriculture. Re-seeding, as well as fencing in of badly damaged areas, will always be at the discretion of the ECO, unless specifically requested by a Landowner. 	<p>No loss of topsoil due to construction activities.</p> <p>All disturbed areas successfully rehabilitated within three months of completion of the Contract.</p> <p>No visible erosion scars three months after completion of the contract.</p>	Contractor, EO.	Contract and allowance in P&G's	For the duration of the construction period.	ECO	During construction

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
11.3 Construction activities on private land								
All activities involving potential interaction with Landowners or their fixed or moveable property	Damage to structures and property Disruption of services	<p>Objective(s):</p> <p>To maintain good relationships with Landowners.</p> <p>Targets:</p> <ul style="list-style-type: none"> The Contractor should keep a record of before and after photos for the whole project. The success of the project depends on the good relations with the Landowners. It is required that the Contractor will supply one person to be the community liaison officer (CLO) for the entire contract. This person shall be available to investigate all problems arising on the work sites concerning the Landowners. 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. The Contractor shall keep a photographic record of access roads. This will then be available should any claims be instituted by any Landowners. All 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 program should they be involved. The contact numbers of the CLO 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. The rights of the Landowners shall be respected at all times and all staff shall be sensitised to this. Eskom must ensure that the owner of the property over which the servitude traverses is allowed free access to and through the servitude so as to prevent unnecessary negative impact on the owners. 	No delays in the project due to Landowner interference.	Contractor, EO	Contract and allowance in P&G's	For the duration of the construction period.	ECO	During construction
ACTIVITY:								
11.6 Actions by site staff								

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
Generation of general waste	Untidy and polluted site and surrounding land	<p>Objective(s):</p> <p>To maintain a neat and tidy workplace.</p> <p>Targets:</p> <ul style="list-style-type: none"> Littering by the employees of the Contractor shall not be allowed. The ECO shall monitor the neatness of the work sites as well as the campsite. 	<p>No visible sign of littering.</p> <p>No complaints from Landowners.</p>	Contractor, EO.	Contract and allowance in P&G's	For the duration of the construction period.	ECO	During construction

12 DECOMMISSIONING

Aspect	Potential Impact	Mitigation Measure(s) (Objective and Target)	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility	Frequency
ACTIVITY:								
12.1 Storage, removal and disposal of waste								
Generation of decommissioning waste	Land pollution Unpleasant odours Decreased aesthetic integrity of the site	<p>Objective(s):</p> <p>To ensure that waste is correctly stored and disposed of, decreasing the visual impact during the decommissioning period. To keep the servitude neat and clean. Disposal of rubble and refuse in an appropriate manner. Minimise litigation. Minimise landowner complaints.</p> <p>Targets:</p> <ul style="list-style-type: none"> No material shall be left on site that could be of harm to humans and animals. Broken, damaged and unused nuts, bolts and washers shall be picked up and removed from site. Concrete foundations may not be dumped indiscriminately on site once removed, but shall be removed from site. Bins and containers must be made available by the contractor for the storage of construction waste. Temporary storage of construction waste will take place within the site, and within areas designated by the ECO and the Contractor although construction waste will not be stored on site for longer than 30 days. The Contractor will be responsible to remove and transport all construction waste material off site to a registered waste disposal facility (proof of this as well as a copy of the sites Registration Permit, must be provided by the Contractor to the ECO). 	Construction waste stored, collected and disposed of as per the requirements of this EMPr.	Contractor and EO	Contract and allowance in P&G's	Waste bins/ skips must be available prior to decommissioning Removal of waste throughout the construction period.	ECO	Throughout decommissioning period. The ECO will determine the frequency of waste removed from site.

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13 CONTRACTOR TO SUPPLY AT TENDER STAGE

This section outlines the important information the Contractor needs to supply for the tender purposes.

13.1 List of method statements required prior to construction

Contractors to supply the following method statements:

- The Contractor shall supply a method statement that outlines the approximate number of people on site, the layout of the camp, management of ablution facilities and wastewater management.
- The Contractor shall provide a method statement with regard to waste management.
- The Contractor shall provide a method statement to provide procedures for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillage of carbon fuels and oils.
- The Contractor shall supply a method statement for the storage of hazardous substances.

The Contractor shall provide all method statements to the ECO prior to associated activities being undertaken on the site.

14 REHABILITATION

This section below describes how the disturbed areas should be rehabilitated after construction

14.1 Rehabilitation of the site

The removal of all construction facilities and materials from the site will be required, and rehabilitation will have to be carried out, including the removal of the following:-

- Concrete and compacted earth platforms;
- Chemical toilets.

Any contaminated material or soil must be removed to a registered hazardous waste disposal facility and the prescribed re-vegetation process must then be followed thereafter.

14.2 Eradication of weeds

All alien vegetation spread over the entire construction footprint must be removed, irrespective of its existence prior to construction. Chemical removal shall be used in accordance with manufacturer's specification for weeds. All chemicals used must be approved by the ECO.



Aurecon South Africa

Aurecon Centre
Lynnwood Bridge Office Park
4 Daventry Street
Lynnwood Manor
0081

Address1

Lynnwood Manor
0081

T +27 12 427 2000

F +27 86 556 0521

E tshwane@aurecongroup.com

W www.aurecongroup.com

Aurecon offices are located in:
Angola, Australia, Botswana, China,
Ghana, Hong Kong, Indonesia, Kenya,
Lesotho, Macau, Mozambique,
Namibia, New Zealand, Nigeria,
Philippines, Qatar, Singapore, South Africa,
Swaziland, Tanzania, Thailand, Uganda,
United Arab Emirates, Vietnam.