



FINAL CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAM

FOR THE

NGWEDI (MOGWASE) SUBSTATION

DECEMBER 2012

VOLUME I: MAIN REPORT & APPENDICES

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LIST OF ABBREVIATIONS

CE	Consulting Engineers
C	Contractor
CELO	Contractor Environmental Liaison Officer
CM	Contract Manager (Eskom)
NEMA	National Environmental Management Act (Dedicated Person)
ECO	Environmental Control Officer
ELO	Environmental Liaison Officer
CEMPR	Construction Environmental Management Programme
DEA	Department of Environmental Affairs
RoD	Record of Decision
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resource Agency
SAMOAC	South African Manual for Outdoor Advertising Control
SS	Site Supervisor

A. SECTION 1: GENERAL INFORMATION

1. Introduction

Baagi Environmental Consultancy CC, as Independent Environmental Consultants, were appointed by Eskom Holdings SOC Limited to facilitate and compile a site specific Environmental Management Program for the Ngwedi (Mogwase) substation. The Ngwedi (Mogwase) substation forms part of the Medupi integration network. The Record of Decision, RoD, pertaining to this project was issued under Reference number 12/12/20/1566, "Proposed Ngwedi (Mogwase) substation and associated transmission lines, Mogwase, North West Province".

2. Background

It is widely accepted that any development can pose various risks to the environment as well as the inhabitants in the surrounding areas. These possible risks should be taken into account during both the construction and operational phase of the development. The purpose of this document is to provide management responses that will ensure impacts resulting from the development are minimised. This CEMPR is, therefore, a stand-alone document, which must be used onsite during each phase of the development (construction and operation).

This document should be flexible, so as to allow the contractor and Eskom Holdings SOC Limited to conform to the management commitments without being prescriptive. The management commitments should ensure that the anticipated risks on the environment will be minimised if they are consistently and effectively adhered to. The onus to undertake the requirements set out in the CEMPR rests with Eskom Holdings SOC Limited, the main contractors and subcontractors, which will promote responsibility and commitment. Any party responsible for transgression of the underlying management measures outlined in this document, will be held liable for non-compliances and will be dealt with accordingly.

Furthermore, this document is considered to dynamic and flexible. Therefore, this document can be amended with new issues, which arise during the entire construction and operational period. The final CEMPR will be submitted to the DEA for approval. In cases where there are significant changes to the CEMPR, then the CEMPR will need to be resubmitted to DEA for approval.

The process that was followed in compiling the CEMPR is in compliance with Regulation 34 in terms of chapter 5 of the National Environmental Management Act (Act 107 of 1998) of New Environmental Impact Assessment Regulation, 2006 promulgated on the 21 April 2006. The purpose of this CEMPR is to formulate mitigation measures that should be made binding on all contractors during the construction phase as well as measures that should be implemented during the operational phase.

3. Project Scope

The proposed project is a component of the Medupi Integration Project. It will entail the construction of a Main Transmission Substation (MTS) called Ngwedi (previously Mogwase) in the

Rustenburg area. A favourable Record of Decision (RoD) was received from the National Department of Environmental Affairs and its reference number is 12/12/20/1566. It must be clearly emphasised that this CEMPR is not solely for all the agreed activities stipulated under positive environmental authorization received from DEA.

The construction of the project (reference number 12/12/20/1566) is being undertaken in phases, therefore this CEMPR is only relevant with regards to the proposed construction of the Ngwedi (Mogwase) Main Transmission Substation (MTS), which has a footprint of 600m X600m (36ha) (as per the EIA)

The final CEMPR must be read in conjunction with the EIR associated with the RoD as well as the Draft EMP included in the EIR. All of these documents should be seen as one set and information should be assessed in conjunction with all the relevant documentation to ensure compliance and correctness. In compiling this CEMPR the conditions of the RoD, the Final EIR and the Draft EMP were taken into account.

4. Terms of Reference of the CEMPR

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

The CEMPR will provide environmental management guidelines, which must be complied with by the contractor during construction of the substation, in fulfilment of ISO 14001 requirements. The Environmental Control Officer (ECO), acting independently from Eskom Holdings SOC Limited, will monitor the implementation of the CEMPR. The CEMPR will form part of the contractual agreement to be entered into by Eskom Holdings SOC Limited and the appointed contractor. Compliance with the CEMPR must therefore, form part of all contractor's working tender documentation and be endorsed contractually. The recommendations and constraints, as set out in this document, are enforceable under the general conditions.

5. Objectives of the CEMPr

The objective of this CEMPR is to ensure that:

- Environmental management conditions and requirements are implemented from the start of the project,
- The contractor is able to and shall include any costs of compliance with this CEMPR into the tender price;

- Precautions against environmental damage and claims arising from such damage are taken timeously;
- 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;
- The asset created conforms to environmental standard required by ISO 14001 and Transmission Policy;
- Eskom Project manager and Contractor take into consideration the landowner special conditions in regards to the substation;
- Environmental conditions stipulated in the Environmental Authorisation (EA) are implemented;
- Resolve problems and claims arising from damaged immediately to ensure a smooth flow of operations;
- Implementation of this CEMPR for the benefit of all involved; and
- Preservation of the natural environment by limiting destructive activities on site.

6. Limitations of the Study

The project initiation meeting held in July 2012 reached consensus amongst project managers and specialists that the study would be conducted over one day, visiting the proposed substation area. The specialists also determined areas to be visited for specific purposes outside of the substation area. This included the visual and avi fauna specialists. This was agreed to be the most effective way in which to do the study and would have enabled each specialist to assess the substation

The study was limited to the information provided by Eskom. The outcome of the CEMPR report is reliant on the findings of the specialist reports as per the relevant discipline.

7. Legal Framework

Depending on the type of development that is being proposed, certain legislation applies, either as a framework to guide the development process or as permit or approval requirements. This CEMPR has been undertaken in accordance with provisions of the Environmental Authorisation issued by the DEA and in accordance with the provision of the Constitution and principles of Integrated Environmental Management.

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);
- National Environmental Management: Air Quality Management Act (Act No. 39 of 2004);
- National Water Act, 1998 (Act No. 36 of 1998);
- National Environmental Management: Biodiversity Act (Act 10 of 2004);
- Fencing Act(No. 31 of 1963 (as amended by act 108 of 1991));
- Occupational Health and Safety Amendment Act (Act No. 181 of 1998);
- Hazardous Substances Act, 1973 (Act No. 15 of 1973);
- National Heritage Resource Act, 1999 (Act No. 25 Of 1999);
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983);
- National Environmental Management: Waste Act (Act No. 59 of 2008).

The Constitution of the Republic of South Africa

The Constitution of South Africa states that everyone has the right to an environment that is not harmful to his or her health or well-being and to have the environment protected for the benefit of present and future generations.

The Act implies that measures must be implemented to:

1. Prevent pollution and ecological degradation;
2. Promote conservation, and
3. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The National Environmental Management Act

There are various elements within the National Environmental Management Act that are relevant to the construction and operational phases of the Ngwedi (Mogwase) substation. The 'polluter pays' concept is enforced to ensure that any party or parties, which undertakes any activity that may cause, causes or caused any pollution, must prevent, mitigate or remedy the effects.

Section 2 of Chapter 1 of the National Environmental Management provides details of the environmental management principles that should be adhere to during both the construction and operational phase of the development. The consideration of various factors must be brought into focus:

- Avoidance/minimisation of the loss of biodiversity,

- Avoidance/minimisation of the disturbance of ecosystems,
- Avoidance/minimisation of pollution,
- Avoidance/minimisation of cultural and heritage sites,
- Avoidance/minimisation/recycling of waste,
- Responsible and equitable use of renewable and non-renewable resources, and
- Avoidance/minimisation/mitigation of adverse impacts.

The National Environmental Management: Air Quality Act

The National Environmental Management: Air Quality Act (AQA) is the main legislative piece that controls air pollution within South Africa. The main objective of the AQA is to restore, protect and enhance the quality of air in South Africa, through sustainable development. The AQA aims to achieve these objectives through the establishment of norms and standards, and provide a regulatory framework for air quality management planning and reporting.

The National Water Act

The National Water Act (NWA) is the main legislative piece that controls both private and public water use within South Africa. According to section 19(1) of the National Water Act 'an owner of land, a person in control of land or a person who occupies or uses land on which any activity or process is or was performed or undertaken or any other situation exists, which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.'

In accordance with Section 21 of the National Water Act the following are considered as water uses and therefore need to be licensed:

- a) Taking water from a water resource.
- b) Storing water.
- c) Impending or diverting the flow of water in a watercourse.
- d) Engaging in a stream flow reduction activity.
- e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1).
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
- g) "Disposing of waste in a manner which may detrimentally impact on a water resource.
- h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.
- i) Altering the beds, banks, course or characteristics of a watercourse.

- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
- k) Using water for recreational purposes.

National Environmental Management: Biodiversity Act

The Biodiversity Act provides for the management and conservation of South Africa's biodiversity within the framework of NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was established. The Biodiversity Act further requires landowners to manage and conserve South Africa's biodiversity for current and future generations. The National Spatial Biodiversity Assessment classifies areas as worthy of protection based on their biophysical characteristics, which are ranked according to priority levels.

Fencing Act

The Act regulates matters with regard to boundary fences of farms and makes provisions for the erection, alteration, maintenance, damage and repair of. It also spells rights of owners or lease holders where the land is subject to certain servitudes and outlines procedures for settling of disputes due to wilful actions including leaving gates opened and unauthorised entry to private land.

Occupational Health and Safety Amendment Act

The Act makes provision for the health and safety of persons at work and persons that are not employees against any hazards that may arise out of or in connection with the work related activities. The act has provisions regarding the maintenance and operation of plant and machinery, working conditions to the use of protective clothing and equipment. The Act therefore informs the EMP on measures and procedures to be incorporated regarding the safety and health of the persons on site.

Hazardous Substances Act

The main objectives of the Hazardous Substances Act is to provide measures, norms and standards for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure. The Hazardous Substances Act also aims to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products.

The National Heritage Resources Act

The Act aims to promote an integrated system for the identification, assessment, and management of the heritage resources of South Africa. Section 35(4) of this above-mentioned Act states that no person may, without a permit issued by the responsible heritage resources

authority; destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite.

This Act is concerned with the protection of the archaeological or paleontological sites or meteorites. Furthermore, Section 36(3) of the National Heritage Resources Act states that no person may, without a permit issued by the relevant heritage resources authority handle any human remains. Human remains can only be handled by a registered undertaker or an institution given the authority to do so under the Human Tissues Act (Act 65 of 1983 as amended).

Conservation of Agricultural Resources Act

The Act provides for control over the utilisation of the natural agricultural resources in the Republic of South Africa in order to promote the conservation of soil, the water resources, vegetation and the combating of weeds and invader plants.

The National Environmental Management: Waste Act

The National Environmental Management: Waste Act is the main legislative piece that aims to consolidate waste management within South Africa. Part 2 of the Waste Act details the general duty in respect to the management of waste by the holder of the waste. In accordance to Section 16(1) of the Waste act, 'a holder of waste must, within the holder's power, take all reasonable measures to:

- a) avoid the generation of waste and where such generation cannot be avoided to minimise the toxicity and amounts of waste that are generated;
- b) reduce, re-use, recycle and recover waste;
- c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;
- e) prevent any employee or any person under his or her supervision from contravening this Act; and
- f) prevent the waste from being used for an unauthorised purpose.'
- g)

8. Possible Permit Applications

Water Use Licence

Any construction or operation activities near or in a permanent drainage system may have implications in terms of the National Water Act 1998 (Act No.36 of 1998), and thereby, may require the application for Water Use Licence. Therefore, the contractor must in consultation with the ECO, assess all areas with the substation well in advance in order to ensure the relevant Water Use License is applied for where required. The following should be considered in terms of Water Use Licence applications:

- Wetlands and other watercourses are protected water resources in the National Water Act (NWA), Act 36 of 1998. Development or transformation of the watercourses is regarded as a *water use*, which can only be allowed through an approved Water Use License, irrespective of the condition of the affected watercourse.
- The NWA defines water use in a watercourse specifically related to wetlands and riparian areas as follow:
 - (c) impeding or diverting the flow of water in a watercourse.
 - (i) altering the bed, banks, course or characteristics of a watercourse.
- New access roads cannot be created through watercourses without a Water Use License. It is therefore important that existing roads be used for access through drainage lines to avoid the creation of new tracks or roads through drainage lines and pans.
- All unavoidable watercourse road crossings, even temporary crossings during the construction phase of the project, will require a Water Use License. A re-alignment of the proposed access road to avoid overlap with buffered watercourses will therefore not require a Water Use License application based on available information for the 500 m Ngwedi Substation buffer area.
- Existing roads should therefore, be used for access as far as possible and new crossings should only be considered as a last resort.
- In addition, no infrastructure can be constructed within a watercourse without a Water Use License.

However, it must be noted that no wetland area was delineated within a 500 m radius (buffer) of the proposed Ngwedi Substation (refer to **Appendix 6**) and that a Water Use License Application in terms of Section 21 (c) and (i) is therefore not expected to be required.

Heritage permit

In the event that any heritage artefacts are found on site, it would be necessary to apply for a Heritage Permit under the National Heritage Resource Act, 1999 (Act No. 25 of 1999). A number of sites dating to the Stone Age, Late Iron Age and more recent historical time-period were identified and recorded by the specialist (refer to **Appendix 6**). Some of the sites (especially the LIA stone walled sites and settlements) are highly significant and if negatively impacted on will have to be mitigated.

9. Environmental Monitoring and Auditing

To measure and ensure compliance to this CEMPR it is imperative that a monitoring and auditing programme be established, in which monthly reports are submitted to Eskom and DEA to indicate the level of compliance. In addition, potential risks to the project will have to be identified. Where the ECO identifies a transgression or blatant disregard to the CEMPR it should be reported to Eskom immediately and rectification steps undertaken.

Bearing in mind that this document is a living document, it may be updated from time to time. The ECO, in consultation with the proponent (Eskom) can make recommendations to the proponent for certain CEMPR amendments. The proponent should then officially apply to DEA for

the approval of the proposed amendments to the CEMPR. The amended CEMPR becomes valid once the authority (DEA) approves it in writing.

B. SECTION 2: SITE SPECIFIC ENVIRONMENTAL MANAGEMENT PROGRAM

1. Background

Environmental aspects that are generic and specific for the construction and operation stages for the substation are identified and mitigation procedures are described.

During the construction phase and maintenance of the substation, some habitat destruction and alteration inevitably takes place. Habitat destruction and alteration will result from the construction of access roads to the substation and the removal of vegetation within the substation footprint. These activities have an impact on birds breeding, foraging and roosting in or in close proximity of the substation through habitat modification.

Where it is anticipated that ecological qualities of the landscape are going to be particularly altered by the substation, whether it to be the position or the result of construction requirements, it is necessary to identify those locations and to describe what mitigations are required. In this way the specific ecological mitigation relates to an identified condition that will result in short term or long term ecological impacts. If this is not addressed in time and in a particular manner, persistent and irreversible long-term ecological impacts will result.

2. Technical Specifications

2.1. Substation Specifications

Ngwedi substation is a 400/132kV step-down substation that will transform the 400kV to 132kV and it therefore links Ngwedi to the existing 132kV distribution network in the area. The technical details regarding the substation are as follows:

- The footprint size of the substation is 600m x 600m;
- The substation will initially accommodate 2x 500MVA, 400/132kV transformers;
- The initial installed capacity of the substation will be 1000MW;
- The substation yard will be fenced and secured; and
- A Telecommunication tower will be 30m high.

The major construction activities that are generally associated with the construction phase of a substation include the following:

- Construction of the access roads to the substation (**Figure 1**);
- Removal of all vegetation within substation footprint;
- Terracing and levelling of the site (**Figure 2**);
- Installation of foundations for infrastructure such as transformers, control building and telecommunication tower (**Figure 3**);
- Construction of bunds and oil holding dams (for emergency holding of transformer oil in the event of a spill) and fire safety walls (**Figure 4**);
- Compaction and filling with gravel of the areas between the foundations;
- Creation of formal drainage and stormwater control measures;

- Delivery and installation of transformers, towers, busbars and associated infrastructure;
- Construction of control rooms and administrative infrastructure;
- Connection of the new infrastructure to the existing 400kV network; and
- Construction of perimeter fencing and lighting.



Figure 1: A typical special access road



Figure 2: Typical substation terrace and levelling



Figure 3: Construction of transformer foundations



Figure 4: Construction of a oil holding dam

3. Environmental Matrix

Function	Name / Cell No	Responsibility
Project Manager (PM) Eskom		Overall management of project and CEMPR implementation
Site Supervisor/ Contract Manager (CM) Eskom		Oversees site works, liaison with Contractor, PM and ECO
Environmental Control Officer (ECO) Eskom		Implementation of CEMPR and liaison between Eskom, Contractor and Landowners
Contractor (C)		Implementation and compliance with recommendations and conditions of the CEMPR, Appoints dedicated person (CELO) to work with ECO
Contractor Environmental Liaison Officer (CELO)		Implementation of CEMPR, landowner interaction, environmental control of site actions, re-mediation and rehabilitation work.
Group Capital Environmental Advisor (Eskom)		Environmental advice and auditing

The point of departure for this CEMPR is to take a pro-active route by addressing potential problems before they occur. This should limit the corrective measures required during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases, as required and if necessary.

4. Responsibility of the Role Players

▪ Eskom Holdings SOC Limited

The Eskom Team remains ultimately responsible for ensuring that the development is implemented according to the requirements of the CEMPR. Although the Eskom Team appoints specific role players to perform functions on their behalf, this responsibility is delegated. The Eskom Team is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, CELO and contractor) to efficiently perform their tasks in terms of the CEMPR. The Eskom Team is liable for restoring the environment in the event of negligence leading to damage to the environment.

The Eskom Team must ensure that the CEMPR is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the CEMPR. The Eskom Team must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.

▪ Contractor

The contractor, as the Eskom's agent on site, is bound to the CEMPR conditions through its contract with the Eskom Holdings SOC Limited, and is responsible for ensuring that it adheres to all the conditions of the CEMPR. The contractor must be thoroughly familiarised with the CEMPR requirements before coming onto site and must request clarification on any aspect of these documents, should they be unclear. The contractor must ensure they have provided sufficient budget for complying with all CEMPR conditions at the tender stage.

The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site engineer in terms of the CEMPR.

▪ Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the Eskom Holdings SOC Limited as an independent monitor of the implementation of the CEMPR and monitor project compliance. The ECO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the CEMPR and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management;
- Undertaking routine monitoring and indentifying a competent person/institution to be responsible for specialist monitoring, if necessary; and
- The ECO has the right to enter the site and undertake monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear).

The following responsibilities, as reflected in the original RoD must be complied with:

- The ECO must be appointed before construction commences. It is advised that the appointment must be before the planning phase as the ECO will be required during this phase as well to ensure that the planned construction is in line with the RoD and CEMPR;
- Monthly reporting to the DEA must include the following information:
 - Description of all activities on site;
 - Problem identified;
 - Transgressions noted; and
 - A task schedule of task undertaken by the ECO.
- ECO shall remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is ready for operation;
- The following will be maintained on site:
 - Records relating to monitoring and auditing must be kept on site and made available for inspection;
 - Site diary;
 - Copies of all monthly reports submitted to DEA;
 - A quarterly audit is conducted and copies of the audit is submitted to the DEA;
 - Schedule of current activities on site as well as monitoring activities schedule; and
 - Compile a register of complaints by the public as well as the remedies applied to the complaints.
- All documentation, reports and notifications, required to be submitted to the department in terms of this authorization, must be submitted to the Director: Compliance Monitoring at the department.

An ECO must be contacted to the oversee the project throughout and up to the completion of the rehabilitation on site and the site is handed over to Eskom by all the contractors.

▪ **Liaison with Authorities**

The ECO will be responsible for liaising with the National Department of Environment (DEA). The ECO must submit monthly environmental reports and quarterly audit reports to the authorities. These environmental and audit reports must contain information on the contractor and Eskom's levels of compliance with the CEMPR.

The audit report must also include a description of the general state of the site, with specific reference to non-compliance. The ECO is to recommend corrective action measures to eliminate the occurrence of the non-compliance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to **Appendix 1**) should be kept on a continual basis.

- **Liaison with Contractors**

The Eskom EO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors with the necessary corrective action to be taken.

- **Contractor Environmental Liaison Officer (CELO)**

The contractor must appoint an Environmental Liaison Officer (CELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the CELO for the contractors' attention and subsequently, CELO liaise with the main contractor for his or her attention. The CELO shall be permanently on site during the construction phase to ensure daily environmental compliance with the CEMPR and should ideally be a senior and respected member of the construction crew.

5. CEMPR Approach

A project team comprised of environmental consultants as a project manager and various specialists have contributed to the compilation of this CEMPR. The specialists and their associate studies, which were undertaken to inform the CEMPR, are listed in the table below.

Specialist	Organisation	Study/Function
Mr. Ryan Nel	Baagi Environmental Consultancy CC	Project Manager
Mr. Lukas Niemand	Pachnoda Consulting cc	Avifauna & Fauna
Mr. Karsten Drescher	Terralogix Consulting cc	Visual Impact Assessment
Mr. Sam Laurence	Enviro-insight	Vegetation & Fauna
Mr. Anton Pelser	A Pelser Consulting CC	Cultural & Heritage
Mr. Retief Grobler	Imperata	Surface Water & Wetland

Prior to a site visit to the proposed Ngwedi (Mogwase) substation the specialists were provided with coordinates in order to acquaint themselves with the area .

The site visit was undertaken on the 13th of August 2012, by the following specialists:

- Avifauna
- Wetland;
- Cultural and Heritage;
- Visual; and
- Flora and Fauna (Ecological).

Tree marking, as required within the Ecology report, was carried out from 15th of August 2012 to 16th of August 2012 and the verification of the sensitive avifauna areas was undertaken on the 30th of August 2012.

The substation, as approved in the RoD, was visited and the specialists applied a site inspection method for the assessment. The project team undertook individual specialist assessments of the substation. In addition, the project team identified sensitive micro-environments along the route, which included water bodies, areas of high erosion, avifauna niches and ecological significant areas. The survey was undertaken on foot and vehicle.

The specialist reports submitted, including potential impacts and recommendations for mitigation measures for the substation have all been incorporated into the CEMPR and specialist reports have been added in this report in **Appendix 6** respectively.

6. Description of the Affected Environmental Aspects

6.1. Flora Aspects

The majority of the habitat consists of thornveld, varying structurally between closed and open. Some stretches of broadleaf ridge habitat and drainage line associated vegetation were also present. Mucina and Rutherford (2006) list the vegetation type as;

Zeerust Thornveld

The Zeerust thornveld represents the primary vegetation type along the line. Structure varies from open vertic grasslands to *Acacia* dominated thornveld. Vertic soils predominated with infusions of sandy loams and intermittent drainage line associated rock structures. Herbaceous layer is prevalent, with grass quality dependent on grazing pressure. The conservation status is listed as Least Threatened.

In addition to the vegetation types listed by Mucina and Rutherford (2006), a number of structural sub-vegetation types have been identified. These include:

- Open grasslands on vertic soil
- Open grasslands
- Open-semi closed thornveld
- Broadleaf ridge vegetation
- Drainage line associated vegetation
- Drainage line associated rock ridge

6.2. Fauna Aspects

For the purpose of this document, the faunal communities are represented by all taxa, excluding avifauna (birds), which are addressed separately. The faunal species are mostly free roaming bushveld associates, with an expected representation of lagomorphs; mesopredators, small to medium sized ungulates as well as smaller faunal taxa such as herpetofauna (reptiles and amphibians) as well as invertebrates, naturally occurring and are not subject to management practices.

6.3. Avifauna Vegetation Aspects

The proposed corridor corresponds to the Savanna Biome and more particularly to the Central Bushveld Bioregion as defined by Mucina & Rutherford (2006). It comprehends an ecological type known as Zeerust Thornveld:

1. *Zeerust Bushveld* – This vegetation type is endemic to the North West Province and extends from Lobatse in the west through to Zeerust and Groot Marico, and eastwards to the plains between Pilanesberg and the western-end of the Magaliesberg mountain range. It is described as a deciduous, short dense thorny woodland on deep soils with a high base-status, and is

dominated by several *Acacia* species. Zeerust Bushveld is least threatened, although poorly conserved with less than 4 % preserved within the Pienaar and Marico Bushveld Nature Reserves.

Local Vegetation Description

The area surrounding the proposed substation locality is represented by three major vegetation communities, each sustaining different bird compositions

- (1) *Open grazed Acacia tortilis shrubland*. This community is located on areas with a flat topography. It is described as a short thorny shrubland pertaining to *Acacia tortilis* and *Dichrostachys cinerea*. The floristic composition and structure of this community is the result of persistent livestock activities (grazing and trampling).

Despite the persistent disturbances caused by cattle, it was evident that the open structure and grazed graminoid layer of the *Acacia tortilis* shrub are visited by a variety of large terrestrial bird species (as evidenced by the occurrence of Kori Bustard *A. kori* and Secretarybird *S. serpentarius* in the region). Many of these species are also prone to power line collisions. In addition, the area also provides an important rangeland habitat for foraging vultures species (e.g. African White-backed Vulture *Gyps africanus*, Cape Vulture *G. coprotheres* and to a lesser degree Lapped-faced Vulture *Torgos tracheliotus*) due to the proximity of the proposed substation to the Pilanesberg Nature Reserve and the anticipated high mortality rate of free-roaming cattle in the nearby tribal lands.

- (2) *Searsia lancea shrubland along drainage lines*. This unit occurs along drainage lines (to north and east of the proposed substation) and is characterised by *Searsia lancea* and *Tarchonanthus camphoratus* shrubland. It is especially prominent along the Elands and Sandspruit Rivers.
- (3) *Arable land on dark clayey soils*. The area earmarked for the proposed substation corresponds to old croplands and fields. These areas provide ephemeral foraging habitat for the White Stork (*Ciconia ciconia*), Abdim's Stork (*C. abdimii*), the "vulnerable" Kori Bustard (*Ardeotis kori*), the "vulnerable" Secretarybird (*Sagittarius serpentarius*) and the "near-threatened" Yellow-throated Sandgrouse (*Pterocles gutturalis*).

Please note that the nearby drainage lines are flight routes and dispersal networks for wading birds and waterfowl (mainly herons, cormorants, ibises, ducks and geese) – any development within these areas will have a definite and significant impact on the avifaunal diversity of the area. In addition, these systems preserve the inherent “links” between important feeding and roosting sites (e.g. Vaalkop Dam and the study area).

6.4. Heritage and Cultural Aspects

The proposed development is located in the Northwest Province, close to Pilanesberg and Sun City. Various villages such as Ledig, Mogwase, Mahobieskraal, Chaneng and Phalane are located

close-by. A number of farms, including Frischgewaagd 96 JQ, Elandsrivierspoort 210 JP, Mahobieskraal 211 JP and Kleingenoeg 124 JP form part of the area.

The topography of the area is generally flat and open, with grassy plains and old agricultural fields, while some sections follow the Elandsriver and is located on its floodplains. The Sandspruit also flows through the area. There are some rocky outcrops (granite) and higher hills over which the corridor traverses. Most of the area is fairly devoid of its natural and original vegetation, although there are section (in the hilly terrain for example) where the vegetation is quite dense and consisting of typical bushveld vegetation. Plain areas also contained clay (turf) and these areas normally did not contain any heritage sites or features as this was not ideal places for settlement (building).

Visibility in general was fairly good, although in certain sections this was hampered by thick, inaccessible vegetation and dense grass cover. Recent historical developments, including farming/agriculture, other infrastructural developments such as residential (rural villages and informal settlement), roads, Power Lines and mining (Pilanesberg Nickel Mine) has impacted on the area and many sites and features that might have existed here in the pas would have been disturbed or destroyed to a large degree. Despite this a fairly large number of sites of varying significance are known to exist in the area, with a number identified and recorded during the 2012 Heritage Walk Down.

Section 34 (1) of the **National Heritage Resources Act** states that no person may demolish any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. A structure means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

Alter means any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or the decoration or any other means.

Section 35(4) of this act deals with archaeology, palaeontology and meteorites. The act states that no person may, without a permit issued by the responsible heritage resources authority (national or provincial):

- a. destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- b. destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- c. trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite;
- d. bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites; or

- e. alter or demolish any structure or part of a structure which is older than 60 years as protected.

The above mentioned may only be disturbed or moved by an archaeologist, after receiving a permit from the South African Heritage Resources Agency (SAHRA). In order to demolish such a site or structure, a destruction permit from SAHRA will also be needed.

Graves and burial grounds are divided into the following:

- a. ancestral graves;
- b. royal graves and graves of traditional leaders;
- c. graves of victims of conflict;
- d. graves designated by the Minister;
- e. historical graves and cemeteries; and
- f. human remains.

In terms of Section 36(3) of the National Heritage Resources Act, no person may, without a permit issued by the relevant heritage resources authority:

- a. destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- b. destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- c. bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Unidentified/unknown graves are also handled as older than 60 until proven otherwise.

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the **Ordinance on Excavations (Ordinance no. 12 of 1980)** (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place.

Human remains can only be handled by a registered undertaker or an institution declared under the **Human Tissues Act (Act 65 of 1983 as amended)**.

6.5. Wetlands and Surface water course

In terms of the Ramsar Convention on Wetlands (Iran 1971), to which South Africa is a contracting party, "... wetlands include a wide variety of habitats such as marshes, peatlands, floodplains, rivers and lakes, and coastal areas such as salt marshes, mangroves, and sea grass beds, but also coral reefs and other marine areas no deeper than six meters at low tide, as well as human-made wetlands such as waste-water treatment ponds and reservoirs" (Ramsar Convention Secretariat 2007).

In South Africa, wetlands are defined as "...land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil" (National Water Act, Act No. 36 of 1998), (NWA). Wetlands are also included in the definition of a watercourse within the NWA, which implies that whatever legislation refers to watercourses will also be applicable to wetlands. The types of features included within the definition of a watercourse include:

- "...a river or spring..."
- "...a natural channel in which water flows regularly or intermittently..."
- "...a wetland, lake or dam into which, or from which, water flows..."
- "...any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse..."

In addition, the NWA stipulates that "...reference to a watercourse includes, where relevant, its bed and banks...". This has important implications for the management of watercourses and encroachment on their boundaries, as discussed further on in this document.

The NWA defines riparian areas as "...the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterized by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas..." Note that this does not imply that the plant species within a riparian zone must be aquatic, only that the species composition of plant assemblages must be different within the riparian area and adjacent uplands.

In terms of the latest wetland delineation document available from the Department of Water Affairs and Forestry (DWAF), now known as the Department of Water and Environmental Affairs (DWEA), "wetlands must have one of the following attributes" (DWAF 2005):

- **Wetland (hydromorphic)** soils that display characteristics resulting from prolonged saturation.
- The presence, at least occasionally, of **wetland associated plants (hydrophytes)**.

- A high **water table** that results in saturation at or near the surface, leading to anaerobic conditions developing in the top 50 cm of the soil.

It follows that the level of confidence associated with a specific area being considered as a wetland is proportionate to the number of confirmed indicators that positively correlate with wetland habitat. Not all indicators are always present within a specific biophysical and land use setting, while not all indicators are always reliable and/or useful under all conditions. The use of additional wetness indicators from different disciplines that are internationally applied therefore adds value and confidence in the identification and delineation of wetland habitats, especially in challenging environments (Illgner et al., 2009).

6.6. Visual Impact Assessment Aspect

The topography consists predominantly of plains with some local relief. The alignment crosses some smaller drainage lines with one section along the Sandspruit which is a subsidiary of the Elandsrivier, which is also traversed.

Placing a substation in the above mentioned landscape will be a visual intrusion that will change the view of the landscape permanently. Furthermore the vegetation is fairly sparse, providing no effective screen. However, there are existing lines along a significant portion of the alignment reducing the overall impact of this particular substation. As the vegetation cover is generally sparse, clearing of vegetation should be restricted to an absolute minimum in aim to retain the little vegetation cover that is present.

The most important mitigation measure is planning and design in such a manner that the substation is placed in such a manner that the visual intrusion is either avoided or limited as far as possible. Secondly, it is important that during the construction phase the short term visual disturbance is kept to a minimum that any such disturbance is adequately rehabilitated such that no long term disturbance remains.

7. Method Statement

A Contractor shall submit a written method statement to the ECO for review and recommendations, covering these activities, which are identified (in this document and/or by the ECO), as being potential harmful to the environment. Method statements indicate how compliance with the Environmental Specification will be achieved. The approval of the method statements will be undertaken by the both the ECO and Eskom.

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 review and provide recommendations on 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 ECO, which shall be done within seven 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 Eskom, the ECO and the Contractor.

The ECO and SS 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 Statement's 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 Program, 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 re-vegetation 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 the Table below, under general environmental specifications for the construction of the development by the

following asterisk (v). Please note that wherever the v 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. The examples of how method statement should be prepared by contractor for different activities are found in **Appendix 7**. All the activities listed under **Appendix 7** as an example for method statement, a contractor shall be required to prepare method statement for each of the activities to be subjected to approval by ECO.

8. Generic Mitigation Measures

These measures must be read with the original EMP complied during the Environmental Impact Assessment for which the Record of Decision has been issued (refer to **Appendix 5**). The ECO must utilise this final CEMP in conjunction with the original Draft EMP.

Construction Phase	Environmental Issue	Mitigation Requirements
1. Appoint contractor, labourers etc	<ul style="list-style-type: none"> All Eskom employees and contracted personnel must be made aware of the environmental sensitivities pertaining to this project. 	<ol style="list-style-type: none"> The ECO must design documentation and have an induction lecture with all Eskom employees and contracted personnel before, and if required during the construction of the substation. The ECO must ensure that all parties are aware of the required legislation as well as the requirements set out by the RoD, EIR, Draft EMP and CEMPR. All parties must sign documentation that indicates their acceptance and acknowledgement of these documents and their contents.
2. Access road selection and construction	<ul style="list-style-type: none"> Vehicles and machinery can impact on natural vegetation. 	<ol style="list-style-type: none"> Limit unnecessary driving and track 'creation'. Make use of existing roads. Do not drive machinery or vehicles through wetlands, pans, seep areas, streams or drainage lines. No creation of roads in pans, wetlands, seep areas, streams etc. Where sensitive areas have been identified bush clearance must be done by hand and not mechanically. No fires are to be made on site, no littering and no preparing of food. All waste to be removed daily from site.
3. Delivery of material for substation	<ul style="list-style-type: none"> See above road access 	<ol style="list-style-type: none"> Limit unnecessary driving and track 'creation'. Make use of existing roads. Do not drive machinery or vehicles through wetlands, pans, seep areas, streams or drainage lines. No creation of roads in pans, wetlands, seep areas, streams etc.

Construction Phase	Environmental Issue	Mitigation Requirements
		<p>5. Where sensitive areas have been identified bush clearance must be done by hand and not mechanically.</p> <p>6. No fires are to be made on site, no littering and no preparing of food. All waste to be removed daily from site.</p>
4. Rehabilitation	<ul style="list-style-type: none"> Damaged sensitive areas 	<p>1. All areas indicated as sensitive which has been damaged during the construction phase must be rehabilitated as per the approved rehabilitation method statement.</p>
5. Construction camp and offices	<ul style="list-style-type: none"> Clearing of natural areas or loss of sensitive areas and habitats 	<p>1. The already established campsites that exist. In the event that the existing campsites cannot be utilised or are unavailable, the correct environmental permits and municipal by-laws must be considered for the establishment of new campsites.</p>
6.Environmental incidents	<ul style="list-style-type: none"> The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves. 	<p>1. The ECO to be informed as soon as the incident has occurred and corrective measures to be implemented.</p>
Operational Phase	Environmental Issue	Mitigation Requirements
1. Maintenance of avifaunal mitigation aspects	<ul style="list-style-type: none"> Bird interactions with the power lines entering the substation may occur during the operational phase, such as collisions, nests, bird related faulting 	<p>1. Eskom's standard line monitoring will be sufficient to detect any problems and allow evaluation of the success of mitigation measures.</p>

8.1. Ecology

Construction Phase	Environmental Issue	Mitigation Requirements
<p>1. Access road selection and construction</p>	<ul style="list-style-type: none"> Erosion can become a problem especially in wetland sensitive areas such as pans, drainage lines, channels. The mechanical action of construction machinery can cause indiscriminate vegetation destruction, soil trampling and compaction effects and localised erosion. 	<ol style="list-style-type: none"> All sensitive areas must be demarcated before construction commences, this includes bush clearance. The demarcated areas must include the all buffer zones. This will ensure that no permit or license requirements are ignored. Drainage lines and pans must be excluded from all heavy construction activities. Termitaria should be excluded from all heavy construction activities where possible. No unnecessary off-road driving, keep to existing road infrastructure. Regular monitoring of the construction process, especially in identified sensitive habitats should be carried out by the ECO all through the construction phase. Construction should be undertaken, where possible, during the hours of 06H00 and 18H00 to minimise the effects of noise. Construction during rutting (late winter) or during the calving/lambing season should be undertaken with minimal disturbance, as far as possible, to rutting and calving. During this period, strict measure must be taken to ensure that mitigation measures that reduce disturbance are adhered to. Measures include speed limits, construction during specified hours, no poaching, avoidance of sensitive areas and non-mechanical cutting of vegetation. Zero tolerance for poaching. No killing of any fauna or wildlife on site. No wood is to be removed from site. No attempt should ever be made to remove or kill any snakes. A local

Construction Phase	Environmental Issue	Mitigation Requirements
		specialist should be called in the event of any encounters.
2. Foundation, excavation and casting of concrete	<ul style="list-style-type: none"> Disruption of soil and seedbed, removal of woody component 	<ol style="list-style-type: none"> Obtain permits for the removal or destruction of trees, which are protected in terms of the National Protected Tree List and the relevant Provincial Conservation Ordinance. Also obtain permits (picking and cutting permits) for the removal of indigenous vegetation. Large trees which could qualify as champion trees should be avoided where possible. Large trees can be removed if the required permit has been obtained. All marked trees must be avoided and left undisturbed if possible. Marked trees can be removed if the required permit has been obtained. Top soil to be temporarily stockpiled/separated from subsoil and backfilled last to facilitate rehabilitation.
3. Delivery of material for substation	<ul style="list-style-type: none"> Impact on fauna due to noise and habitat destruction 	<ol style="list-style-type: none"> Construction should be undertaken, where possible, during the hours of 06H00 and 18h00 to minimise the effects of noise. Delivery during rutting (late winter) or during the calving/lambing season should be undertaken with minimal disturbance, as far as possible, to rutting and calving. During this period, strict measure must be taken to ensure that mitigation measures that reduce disturbance are adhered to. Measures include speed limits, construction during specified hours, no poaching, avoidance of sensitive areas and non-mechanical cutting of vegetation. Zero tolerance for poaching. No killing of any fauna on site.
4. Construction of substation	<ul style="list-style-type: none"> Impact on fauna due to noise and habitat destruction 	<ol style="list-style-type: none"> Construction should be undertaken, where possible, during the hours of 06H00 and 18h00 to minimise the effects of noise. Delivery during rutting (late winter) or during the calving/lambing season should be undertaken with minimal disturbance, as far as possible, to rutting and calving. During this period, strict measure must be taken to ensure that

Construction Phase	Environmental Issue	Mitigation Requirements
		<p>mitigation measures that reduce disturbance are adhered to. Measures include speed limits, construction during specified hours, no poaching, avoidance of sensitive areas and non-mechanical cutting of vegetation.</p> <p>3. Zero tolerance for poaching.</p> <p>4. No killing of any fauna on site.</p> <p>5. No attempt should ever be made to remove or kill any snakes. A local specialist should be called in the event of any encounters</p>
5. Rehabilitation	<ul style="list-style-type: none"> Disturbed soil potentially colonised by weeds and invaders 	<p>1. Use stored topsoil for top soiling and the introduction of local, indigenous species.</p> <p>2. Where sensitive areas have been damaged a rehabilitation plan must be designed and implemented under the control of the ECO.</p>
Operational Phase	Environmental Issue	Mitigation Requirements
1. Maintenance of ecological mitigation aspects	<ul style="list-style-type: none"> Increase in weeds and invader species, erosion of the maintenance road 	<p>1. Substation footprint should be monitored for the sprouting and establishment of declared weeds and invaders, especially in areas that have been disturbed during the construction phase.</p>
2. Invasive alien plant species	<ul style="list-style-type: none"> Introduction and spread of invasive alien plant species 	<p>1. Eradicate all declared alien invasive plant species through use of a specialist group, such as Working for Water.</p>

8.2. Surface Water and Wetlands

Construction Phase	Environmental Issue	Mitigation Requirements
1. Concentration of surface flow patterns	<ul style="list-style-type: none"> Changes to the hydrological regime (e.g. duration, frequency, timing, volume and/or velocity of flows) and hence spatial extent of watercourses and/or hydrological cues for aquatic biota. 	<ol style="list-style-type: none"> 1. Substation footprint that overlaps with surface watercourses need to be moved to avoid negative impacts and legislative transgressions.
2. Hydrocarbons (e.g. diesel and petrol) polluting watercourses	<ul style="list-style-type: none"> Oxygen depletion, bioaccumulation of toxic compounds in biota, disruption of the endocrine system in biota 	<ol style="list-style-type: none"> 1. A spill cleanup program must be designed before construction commences. 2. All parties must have an induction cause to ensure they understand and can implement the spill cleanup program. 3. All refuelling should occur outside of buffered watercourses and drainage lines
3. Loss of vegetation cover (e.g. through vegetation clearing) and erosion.	<ul style="list-style-type: none"> Loss in watercourse habitat, change in vegetation cover, potential increase in turbidity and hence decrease in water quality. 	<ol style="list-style-type: none"> 1. All watercourse and sensitive habitats are to be demarcated and avoided if possible. It is important that buffered depressions (pans) and drainage lines be demarcated on site, as well as in the surrounding landscape, as identified in this report, prior and during the construction phase of the project.
4. Substation construction, roads, stockpiles, fences and other infrastructure.	<ul style="list-style-type: none"> Modifies watercourse habitat, change flow patterns and surface ponding. 	<ol style="list-style-type: none"> 1. New access roads cannot be created through watercourses without a Water Use License. It is therefore important that existing roads be used for access through drainage lines to avoid the creation of new tracks or roads through drainage lines and pans. 2. It is recommended that, if possible, the proposed Ngwedi substation is moved a short distance to the west (approximately 50m-100m) to avoid overlap with the 50m watercourse buffer.
5. Construction activities in wetlands and sensitive habitat (e.g. the construction of temporary and permanent watercourse crossings).	<ul style="list-style-type: none"> flow resistance, loss of habitat, and elevated erosion risk. 	<ol style="list-style-type: none"> 1. All water courses and sensitive habitats is to be demarcated and avoided if possible. 2. Rehabilitation of these areas to be done directly once construction has been completed in the area. 3. A rehabilitation program for these areas, as indicated in this report, is to be

Operational Phase	Environmental Issue	Mitigation Requirements
1. Maintenance of ecological mitigation aspects	<ul style="list-style-type: none"> • Management and maintenance of erosion area 	<p>developed and implemented.</p> <ol style="list-style-type: none"> 1. Construction footprint should be monitored for erosion and degradation of sensitive and wetland areas. Any areas indicating degradation from the baseline information in the EIR and this CEMPR or erosion areas must be rehabilitated.
2. Invasive alien plant species	<ul style="list-style-type: none"> • Introduction and spread of invasive alien plant species, especially in wetland zones 	<ol style="list-style-type: none"> 1. Eradicate all declared alien invasive plant species through use of a specialist group, such as Working for Water.

8.3. Heritage

Construction Phase	Environmental Issue	Mitigation Requirements
1. Access roads to substation	<ul style="list-style-type: none"> • Damage to artefact scatters on landscape (open sites) 	<ol style="list-style-type: none"> 1. Avoid graves on site as indicated and be on the lookout for other graves in the area. 2. Use existing infrastructure (tracks and farm roads) where possible. 3. New roads only to be constructed where unavoidable. These preferably to be surveyed. 4. Should any additional archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, must cease immediately and the ECO must be notified as soon as possible.
2. Foundation, excavation and casting of concrete	<ul style="list-style-type: none"> • Buried archaeological material may be accidentally unearthed during the course of construction 	<ol style="list-style-type: none"> 1. Should any additional archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, must cease immediately and the ECO must be notified as soon as possible. 2. If this occurs, all construction activities are to be halted immediately and SAHRA must be informed.
3. Delivery of material (substation)	<ul style="list-style-type: none"> • Damage to artefact scatters on landscape (open sites) 	<ol style="list-style-type: none"> 1. Use existing infrastructure (tracks and farm roads) where possible. 2. New roads only to be constructed where unavoidable. These preferably to be surveyed.
4. Construction of substation	<ul style="list-style-type: none"> • Construction teams on site collecting or damaging archaeological artefacts and sites • Damage to archaeological resources • Damage to significant archaeological sites 	<ol style="list-style-type: none"> 1. The environmental officer should ensure that this does not occur. 2. The developments should stay clear of drainage lines and rocky outcrops were possible. 3. Mitigation measures for significant sites would include detailed mapping and drawing, archaeological excavations and management.
5. Rehabilitation	<ul style="list-style-type: none"> • Surface scatters of artefacts will be moved 	<ol style="list-style-type: none"> 1. No mitigation required, as these are open sites and not stratified and sealed. Damage to artefacts will be most unlikely.

Construction Phase	Environmental Issue	Mitigation Requirements
Operational Phase	Environmental Issue	Mitigation Requirements
1. Maintenance of heritage/archaeological mitigation aspect	<ul style="list-style-type: none"> Looting of sites by maintenance teams 	<ol style="list-style-type: none"> Access to cultural and heritage sensitive sites must be denied to maintenance teams. No collection of artefacts on any site.

8.4. Visual

Construction Phase	Environmental Issue	Mitigation Requirements
1. Access roads to substation	<ul style="list-style-type: none"> • Access roads on sloping landforms form long term visual scars in the landscape • Paint markings on rocks or trees disfigures the natural setting • Clearing vegetation produces a visible scar in the landscape 	<ol style="list-style-type: none"> 1. Use existing roads and tracks as far as possible. 2. Select road alignments that minimise the need for cut and fill sections. 3. Construct cut and fill slopes to blend in with surrounding landforms. 4. Use material from the foundation excavations to construct water runoff diversions to minimise erosion. 5. Use steel rods with tags for any required markings.
2. Construction camps (substation)	<ul style="list-style-type: none"> • The concrete foundations, especially on sloping landforms, appear as visual marks. 	<ol style="list-style-type: none"> 1. Clear vegetation by cutting only – do not use any earth moving equipment. 2. All waste shall be disposed of in an adequate manner.
3. Foundations (substation)	<ul style="list-style-type: none"> • The concrete foundations, especially on sloping landforms, appear as visual marks 	<ol style="list-style-type: none"> 1. Stockpile excavated material on the upslope of the excavation. 2. After construction, spread the excavated material such as to prevent erosion. Shape the placed material to blend in with surrounding landforms (e.g. no sharp edges). 3. Remove all surplus concrete. Surplus excavated material to be used for erosion diversion in the access roads and for filling borrow pits.
4. Delivery of material (substation)	<ul style="list-style-type: none"> • Visual degradation due to clearing vegetation for storing of components • Clearing vegetation for level areas for tower assembly 	<ol style="list-style-type: none"> 1. Select available flat areas with few large bushes or trees. 2. Clearing of vegetation by cutting only – do not use any earthmoving machinery
5. Construction of substation	<ul style="list-style-type: none"> • Disturbance to vegetation by cranes and associated machinery during erection 	<ol style="list-style-type: none"> 1. Where, and if possible, select available flat areas with few large bushes or trees. 2. Earthmoving machinery to be used for levelling the substation footprint.

Construction Phase	Environmental Issue	Mitigation Requirements
		3. Repair damaged areas as soon as operation is complete.
6. Borrow pits (substation)	<ul style="list-style-type: none"> Excavation of borrow pits causes visual scars in the landscape, especially on sloping landforms 	<ol style="list-style-type: none"> Use suitable flat areas. Remove 500mm of topsoil and stockpile. Use surplus material from foundation excavations as filling material.
7. Rehabilitation (substation)	<ul style="list-style-type: none"> General damage to the land surface will increase with erosion, resulting in long term visual scars. 	<ol style="list-style-type: none"> Break-up the soil in all areas compacted by machinery and use stockpiled material to reshape disturbed areas to blend into the respective surrounding landscape. Seed with approved indigenous species. In agreement with the landowner, rehabilitated areas on sloping landforms should be temporarily fenced to prevent access of game and/or livestock. Consultation with landowner should be undertaken to determine preferred rehabilitation strategy.
Operational Phase	Environmental Issue	Mitigation Requirements
1. Maintenance of visual intrusion	<ul style="list-style-type: none"> Effectiveness of mitigation measures applied during and after construction Closely linked to landscape management – failure has a negative visual implication (e.g. erosion) 	<ol style="list-style-type: none"> Quarterly inspection of all rehabilitated areas. Immediate remedial action in areas that show ineffective rehabilitation. Monitor the progress of the rehabilitation measures and apply different techniques were necessary until acceptable rehabilitation has been achieved.

8.5. *Avi-Fauna*

Construction Phase	Environmental Issue	Mitigation Requirements
1. Access roads to substation	<ul style="list-style-type: none"> • Damage to sensitive areas/habitats (e.g. dams and drainage lines). 	<ol style="list-style-type: none"> 1. Existing roads should be used during the construction phase and no access roads are allowed on or near any sensitive area/habitat 2. Drainage lines and dams must be excluded from all heavy construction activities.
2. Wetland areas	<ul style="list-style-type: none"> • Damage to sensitive areas/habitats 	<ol style="list-style-type: none"> 1. These areas should be avoided by all means and no construction personnel or vehicles may enter such areas. If avoidance of these areas are not possible, then the required Water Use Licence must be obtained for the DWA.
3. Construction camps (substation)	<ul style="list-style-type: none"> • Damage to sensitive areas/habitats 	<ol style="list-style-type: none"> 1. Large trees and dead trees should preferably be retained. 2. Sensitive areas and habitats surrounding the construction camps should be barricaded.
4. Construction of substation	<ul style="list-style-type: none"> • Damage to sensitive areas/habitats 	<ol style="list-style-type: none"> 1. All areas that provide suitable habitat for the Yellow-throated Sandgrouse (<i>Pterocles gutturalis</i>) to occur, including the footprint of the substation, should be "screened" prior to the construction phase for roosting or breeding individuals 2. When encountered, construction activities should cease until the nestlings have successfully fledged and left the area. 3. Construction during peak breeding months of June-July should be undertaken with minimal disturbance, as far as possible, to breeding. During this period, strict measure must be taken to ensure that mitigation measures that reduce disturbance are adhered to. Measures include construction during specified hours, no poaching and avoidance of sensitive and demarcated areas. 4. Fit metal bird guards/spikes on all bends (self supporting towers) entering into the substation.
Operational Phase	Environmental Issue	Mitigation Requirements

<p>1. Monitoring of collisions</p>	<ul style="list-style-type: none"> • bird mortalities due to power line collisions of turn-in within the substation 	<ol style="list-style-type: none"> 1. It is strongly advised that the substation be patrolled every month for at least a year (preferably two years) after commencement of the operational phase to quantify bird mortalities of species and numbers involved in collisions (counting of carcasses or signs of carcasses). 2. The data should be stored at the electrical infrastructure mortality incident register of EWT
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9. General Environmental Specifications for the Construction and Operational Phase

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
<ul style="list-style-type: none"> Construction Initiation, Site Monitoring, Auditing and Reporting 			
❖ Eskom must appoint a suitably qualified ECO, prior to the commencement of construction, on a daily basis, monitor project compliance with the conditions of EA, environmental legislation and the recommendations of the revised EMP. Eskom to notify the authorities of the appointment.	PM	Once-off	
❖ The ECO / CELO shall remain employed until all rehabilitation measures are completed and the site is handed over to Eskom by the contractor for operation.	PM	Continuous	
❖ Fourteen (14) days written notice must be given to the Department prior to construction and prior to operation commencing. Commencement for the purposes of this condition includes site preparation. The notice must include the anticipated date on which the activity will commence.	PM	Prior to construction	
❖ Records and documents as indicated below must be kept on site in accordance with the standard Eskom site documentation policy. The documentation shall be signed by all parties to indicate acceptance and understanding. <p>The following documentation shall be kept on site:</p> <ol style="list-style-type: none"> 1. Access negotiations and physical access Program; 2. Complaints register; 3. Site daily dairy; 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 Program; 7. Environmental Incident Log; 8. ECO inspection audit reports; 9. The record of decision issued for the project. 10. Copies of all permits and licenses, and 11. HIRSA 	Contractor CELO	Continuous	
❖ All records relating to monitoring and auditing must be made available for inspection to any relevant authority, or Eskom's Environmental Audit Team (Tx service Environmental	Contractor	As necessary	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
Advisor), in respect of the development. Monthly reports of the ECO must be submitted to all relevant authorities.	CELO		
❖ DEA 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 EIR report and this CEMPR.	Contractor CELO	As necessary	
❖ No work shall commence until permission is granted from the Environmental Advisor from Transmission Services and acceptance of this EMP from DEAT has been obtained.	PM	Once-off	
❖ The landowners shall always be kept informed about any changes to the construction programme should they be involved.	ECO CELO	As necessary	
<ul style="list-style-type: none"> ❖ All contact with landowner shall always be courteous at all times and a record of all conversations must be kept. ❖ The rights of landowners shall be respected at all times and all staff shall be sensitized to the fact that they are working on the private property. ❖ The contact numbers of the contractor's, ECO officer and the Eskom project manager shall be made available to the landowner as this will ensure open channels of communication and prompt response to queries and claims. 	ECO CELO	As necessary	
Management objectives		Measurable targets	
<ul style="list-style-type: none"> ▶ Maintain good relationship with Landowners. ▶ Maintain accurate records in order to prove compliance to the CEMPR and Eskom 's commitment to fulfil these requirements 		<ul style="list-style-type: none"> ▶ No delays in the project due to Landowner interference ▶ Landowner signs final release form. 	
▪ Environmental Induction Training			
❖ An initial environmental awareness training session is required prior to any work commencing.	CELO	When new staff are contracted and before the start of construction and if required follow up after environmental impact incidence, outside of the CEMPR or EIA occurred	
❖ The contractor must ensure that all site staff are aware of, and understand the contents and condition of CEMPR, the key environmental issues and the consequences of non-	Contractor	As necessary	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
compliance.	C ECO		
❖ The ECO will assist 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 the site, to his subcontractor, casual labourers and to the suppliers.	Contractor ECO	As necessary	
❖ All site staff must attend induction training on the CEMPR and records must be kept of all attendees. <ul style="list-style-type: none"> • Induction training must be undertaken in a language that is understood by site staff and must include the following topics: • Key potential or actual environmental construction related impacts on site related environmental precautions, which need to be taken to avoid or mitigate these impacts; • Key mitigation measures to be implemented during construction activities; • Emergency responses to issues on site; • Roles and responsibilities of all staff on site; and • The benefits of achieving conformance with, and consequences of transgressions of environmental specifications or requirements of the CEMPR. 	Contractor ECO	As necessary	
▪ Planning and Site Preparation			
❖ All work must be undertaken in an environmentally sensitive manner.	Contractor	Continuous	√
❖ The Contractor must provide Eskom with the intended actions and programme for site establishment including the site layout, demarcation for hazardous materials storage, soil stockpiles, stormwater management infrastructure, access points for deliveries and services, and the position of site offices and ablutions.	Contractor	Once-off	√
❖ A precautionary approach must be adopted with any works deviating from specifications being approved by both the SS/CM and ECO.	Contractor ECO	Prior to construction	
❖ All site establishment components must be positioned to <ul style="list-style-type: none"> • Limit visual intrusion on neighbours; and • Minimise the area disturbed. 	Contractor ECO	Continuous	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
	CECO		
❖ 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	
❖ Municipal by-laws should be consulted and if required, approval for the contractors camp should be obtained from the local municipality.	Contractor ECO	Prior to construction	
❖ The contractor's camp shall be sited so as to cause the least amount of disturbance to adjacent landowners and fenced.	Contractor PM ECO CELO	Prior to construction	
❖ 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	
❖ Operations and construction activities must only occur during daylight hours 06H00 to 18H00. Any activities outside of these time frames must be approved by the local communities and land owners.	Contractor CELO	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	√
<ul style="list-style-type: none"> ▪ Demarcation of sensitive areas as determined by the specialist studies 			

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ Sensitive areas shall be fenced and areas secured before construction can proceed.	Contractor ECO	Continuous	
❖ “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 CELO	Continuous	
▪ 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 stabilized as soon as is practically possible.	Contractor CELO	Continuous	√
❖ All earthworks and excavations must be undertaken in such a manner so as to minimize the extent of any impacts caused by such activities.	Contractor ECO	Continuous	
❖ Disturbance of vegetation must be limited to areas of construction.	Contractor ECO	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 CELO ECO	Continuous	
❖ Impacts on surrounding servitudes shall be avoided at all costs.	Contractor ECO	Continuous	
❖ The topsoil (i.e. the top 10-20 cm of soil, depending on the landscape position) must be stockpiled in a suitable place in order to be replaced on top of the exposed subsoil during rehabilitation.	Contractor CELO	As necessary	
❖ Soil stockpiles should not exceed 2 m in height and no traffic should be allowed on top of the stockpiles.	Contractor CELO	As necessary	
❖ Erosion damage to soil stockpiles should be prevented with soil conservation works such as deflection berms etc.	Contractor ECO	As necessary	
❖ Topsoil stockpiles older than 6 months should be upgraded/enriched before use to ensure the effectiveness of the topsoil.	Contractor CELO	As necessary	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ 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/re-vegetated.	Contractor ECO	On completion of construction	
▪ Access to Site			
❖ The site and associated infrastructure and equipment shall be off-limits to the public.	Contractor ECO	Continuous	
❖ All construction vehicles using public roads shall be in a roadworthy condition.	Contractor ECO	Continuous	
❖ Vehicle speeds shall not exceed 40km/h along un-tarred roads on private property or when traversing unconsolidated and non-vegetated areas. Where necessary, speed limits must be indicated on the roads.	Contractor	Continuous	
❖ Construction Vehicles shall not be maintained or serviced on site. Spills of any kind will be reported as an incident and rehabilitation implemented.	Contractor ECO CELO	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	√
<ul style="list-style-type: none"> ❖ The SS shall, together with a representative of the Contractor, negotiate with each landowner the access route. The access agreement will be formalized in the form – "Access to Farms" and signed by the three parties (refer to Appendix 9). ❖ The Contractor will mark the proposed route and/or a competent representative will accompany the equipment when opening the access gate. ❖ Any deviation from the written agreement shall be closed and re-vegetated immediately. 	SS Contractor CELO ECO	As necessary	
❖ The Contractor shall signpost the access roads to the substation, immediately after access has been negotiated.	Contractor ECO	Once access has been negotiated.	
❖ Maximum use 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)	Contractor ECO	Prior to use of roads	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
and the condition thereof agreed by the landowner, the SS and the Contractor.			
❖ All private roads used for access to the substation shall be maintained by the Contractor and upon completion of the works, be left in 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 CELO SS ECO	Continuous	√
• 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 and the condition thereof agreed by the landowner, the SS and the Contractor.	Contractor CELO ECO	Prior to use of Roads	
❖ All private roads used for access to the substation shall be maintained by the Contractor and upon completion of the works, be left in 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 CELO SS ECO	Continuous	√
❖ Implement dust control measures, such as dampening with water or use of specific chemicals will be implemented where necessary, as indicated by Eskom.	Contractor CELO	Continuous	
❖ Ensure traffic safety measures (e.g. traffic warning signs, flagmen) are erected to the satisfaction of Eskom.	Contractor CELO	Continuous	
• Construction of new roads			
❖ As far as possible, access roads shall follow the contour in hilly areas, as opposed to winding down steep slopes.	Contractor ECO	Prior to construction	√

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ 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 ECO	Prior to construction	
❖ The Contractor must inform the SS and ECO before entering any of the following areas: i) Naturally wet areas: Pans, Drainage lines and Channels identified. ii) Any area after rain; and iii) Any environmentally sensitive area.	Contractor ECO	As necessary	
❖ If access is across running water, the Contractor must take precautions not to impede the natural flow of water. If instructed, the Contractor must 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/ECO and the landowner.	Contractor 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 with a side slope of over 4%, roads may be constructed to a 4% out slope. 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	Contractor ECO	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 ECO SS	Upon completion of new roads	√
❖ No cutting and filling shall be allowed in areas of 4% side slope and less.	Contractor ECO	As necessary	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ Contours shall not be crossed by vehicles and equipment unless agreed upon, in writing, by the landowner and the SS.	Contractor CELO SS ECO	As necessary	
❖ Existing drainage systems shall not be blocked or altered in any way.	Contractor CELO	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 CELO	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 site.	Contractor CELO ECO	As necessary	
❖ Alignments of roads must be selected to minimize adjacent landform change such as cut and fill sections.	Contractor CELO	As necessary	√
❖ In cut sections strip the top layer of soil (minimum 100 mm), stockpile upslope of the cut area in windrows or in separate areas. This soil will include rock and vegetation.	Contractor CELO	As necessary	
❖ Shape cut and fill slopes to blend with adjacent landform by rounding off top cut and fill slopes, respreading soil and the placement of rocks packed or randomly placed to hold the replaced soil.	Contractor CELO/ECO	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/ CELO ECO	As necessary	
❖ 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. Where required, a Water Use Licence must be obtained from the DWA.	Contractor ECO	As necessary	
❖ Any dangerous crossings shall be marked as such and where necessary, speed limits shall be enforced.	Contractor	Prior to construction	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
	ECO		
<ul style="list-style-type: none"> Closure of roads 			
❖ Upon completion, only roads as indicated by the SS shall be closed.	Contractor SS ECO	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	
<ul style="list-style-type: none"> ❖ In areas with 30% slope and less, the fill of the road shall be placed back into the roadway using equipment that does not work outside the road cut (e.g. back-hoe). ❖ In areas of greater than 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 side slope shall be re-established and re-vegetated. 	Contractor ECO	Upon completion	
❖ Replacement of earth shall be at slopes less than the normal angle of repose for the soil type involved.	Contractor ECO	As necessary	
❖ A photographic record of the condition of existing access / private roads to be used shall be made prior to their use for comparison purposes at the end of the construction period.	Contractor CELO ECO	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 ECO	Prior to construction	
❖ All roads that are not to be used shall be marked with a "NO ENTRY" sign.	Contractor ECO	As necessary	
❖ All roads closed will be rehabilitated to the surrounding natural areas, with six monthly follow-up to determine success of the rehabilitation as well as to determine if any erosion has occurred. The rehabilitation monitoring should continue as per the rehabilitation plan or until success of the road rehabilitation is assured.	ECO	After road closure and twice yearly	
<ul style="list-style-type: none"> Water diversion berms 			

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ Develop a clean and dirty water separation plan prior to construction	Contractor ECO	Once-off	√
❖ All water diversion berms must be approved by the ECO and Eskom.	Eskom ECO	As necessary	√
❖ 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: <ul style="list-style-type: none"> • Where the track has a slope of less than 2% : 50m apart • Where the track has a slope of 2% - 10% : 25m apart • Where the track has a slope of 10% - 15% : 20m apart • Where the track has a slope of more than 15% : 10m apart 	Contractor CELO ECO	As necessary	
❖ Berms shall be suitably compacted to a minimum height of 350mm.	Contractor CELO 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 CELO ECO	As necessary	
❖ Berms shall be constructed so that a canal is formed at the upslope side.	Contractor CELO ECO	As necessary	
❖ Berms should be created not closer than 10m from identified wetland areas, so as to ensure that no construction material and/or waste flow into wetland systems.	Contractor CELO ECO	Continuous	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ 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	
❖ 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	
❖ 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. ❖ The grass mix should consist of a mix of <i>Cynodondactylon</i> (50%); <i>Eragrostiscurvula</i> (30%) and the remainder should consist of other pioneer grass species suitable for the area (20%). The introduction of forbs from the Fabaceae family is also recommended.	Contractor CELO ECO	As necessary	
❖ The above water diversion berms shall be maintained at all times and be repaired at the end of the contract.	Contractor CELO 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 CELO 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 CELO ECO	As necessary	
<ul style="list-style-type: none"> • Borrow pits 			

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ 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 re-vegetation 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 an authorization is required under the Mineral and Petroleum Resources Act, 2002 for the opening or extension of borrow pits.	Contractor ECO SS	As necessary	√
Management objectives		Measurable targets	
<ul style="list-style-type: none"> ▶ Minimize damage to existing access roads. ▶ Minimize damage to environment due to construction of new access roads. ▶ Minimize loss of topsoil and erosion. 		<ul style="list-style-type: none"> ▶ 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 	
<ul style="list-style-type: none"> • Gate installation and gate control 			
❖ Attention is drawn to the Fencing Act No. 31 of 1963, 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 ECO	Continuous	
❖ 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 unless all gates in have been installed. Installation of gates in fences on major road reserves shall comply with the ordinances of the relevant Provincial Authority. No gates may be installed in fences along National Roads and railway lines.	Contractor ECO	Prior to Construction	
<ul style="list-style-type: none"> • 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 (refer to Appendix 8).	Contractor ECO	As necessary	
❖ 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 ECO	As necessary	
<ul style="list-style-type: none"> • Securing of gates 			

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ The Contractor shall ensure that all gates used are kept closed and locked at all times.	Contractor	As necessary	
❖ The Contractor shall provide locks for all gates, and when responsibility taken over by the Employer, these locks shall be recovered by the Contractor and replaced by locks supplied by the Employer. ❖ The Contractor shall also ensure that all existing farm gates used are kept closed. ❖ The Contractor shall provide the SS with keys for the above locks. No keys shall be provided to landowners to avoid conflict situations between neighbouring landowners.	Contractor ECO	As necessary	
Management objective		Measurable targets	
<ul style="list-style-type: none"> ▶ Minimize damage to fences. ▶ Limit access to Eskom and Contractor personnel with gate keys. ▶ Manage the movement of livestock. 		<ul style="list-style-type: none"> ▶ No transgressions of the fencing act and therefore no litigation ▶ No damage to fences and subsequent complaints from Landowners ▶ All gates equipped with locks and kept locked at all times to limit access to key holders ▶ All fences properly tied off to the gate posts ▶ All gates properly and neatly installed according to specifications ▶ No complaints or claims due to open gates 	
<ul style="list-style-type: none"> • Ablution Facilities 			
❖ Abluting anywhere other than in the toilets shall not be permitted. Under no circumstances shall use of the veld be permitted.	Contractor ECO	Continuous	
❖ Toilets must be secured to prevent them from blowing over.	Contractor ECO	Continuous	
❖ A registered service provider shall be appointed and shall empty toilets regularly.	Contractor ECO	Prior to construction	
❖ Chemical and waste from toilet cleaning operations should not be spilled on the ground at anytime.	Contractor CELO ECO	Continuous	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ Ablution facilities must be maintained in a hygienic state and serviced regularly. Toilet paper will be provided. Toilet paper is also a source of littering, and the Contractor shall be forced to clean up any litter.	Contractor CELO	Continuous	
• Water Management			
❖ Strict control shall be maintained and the ECO shall regularly inspect the abstraction point and methods used. The connection must be kept in neat working order without leaks or spillages.	Contractor CELO ECO	Continuous	
❖ Storm water must be effectively captured and led well away from structures.	Contractor CELO ECO	As necessary	
❖ No ponding of surface water shall occur adjacent to foundations both during and after construction.	Contractor CELO ECO	Continuous	
❖ No mechanical plant or equipment shall be washed on site, unless in an area equipped for such a purpose.	Contractor CELO ECO	Continuous	
❖ Pollutants such as cement, concrete, lime, chemicals and fuels shall not be discharged into any water source or wetland.	Contractor CELO ECO	Continuous	
❖ Water from ablution facilities and the Contractor's camp shall be discharged into a conservancy/septic tank for removal from the site.	Contractor CELO ECO	Continuous	
❖ The dust control measures, such as watering, chemical stabilisation and the reduction of surface wind speed through the use of windbreaks and source enclosures must be put in place during construction activities. Emission control efficiencies of 50% can readily be achieved through the implementation of effective watering programme for unpaved roads and material handling points.	Contractor CELO	Continuous	
• Air Quality			

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ The production of dust from areas cleared of vegetation and soil stockpiles shall be avoided.	Contractor CELO ECO	Continuous	
❖ Stockpiles shall be located in areas where they are exposed to the minimum erosive effects of wind.	Contractor CELO ECO	As necessary	
❖ Excavation, handling and transport of erodable materials must be avoided under high wind conditions.	Contractor CELO ECO	As necessary	
❖ Dust-suppression measures must be used on stockpiles and exposed areas.	Contractor CELO	As necessary	
❖ All machinery and equipment to be used on site shall be properly serviced and in good working order to avoid excessive smoke and exhaust fumes.	Contractor	Continuous	
• Erosion and Sedimentation Control			
❖ Areas susceptible to erosion shall be protected by installing temporary and permanent drainage works.	Contractor CELO ECO	As necessary	✓
❖ Cleared areas must be stabilized and managed to prevent and control erosion. The method of stabilization shall be determined in consultation with the SS.	Contractor CELO SS ECO	As necessary	
❖ Measures must be implemented to protect the construction site from erosion by stormwater.	Contractor ECO	Continuous	
❖ Vehicular traffic shall not be allowed in permanently wet areas.	Contractor ECO	Continuous	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ No damage shall be caused to wet areas.	Contractor ECO	Continuous	
❖ Where necessary, alternative methods of construction shall be used to avoid damage to wet areas.	Contractor ECO	Continuous	
❖ 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 and a representative of Eskom, assess all areas along the alignment well in advance in order to ensure the relevant Water Use License is applied for where required.	Contractor ECO	As necessary	
Management objectives		Measurable targets	
<ul style="list-style-type: none"> ▶ Avoid wet areas to prevent damage. ▶ Avoid the requirement for additional environmental authorisations as a result of working in wetlands. 		<ul style="list-style-type: none"> ▶ No damage to wet areas ▶ No complaints from landowners and litigation 	
• River crossings			
❖ If a river crossing or stream crossing must be created, a Water Use License must be obtained from the Department of Water Affairs and Forestry before the crossing is constructed.	Contractor CELO ECO	As necessary	
❖ Stream and river crossings shall be avoided as far as practicable as they may cause erosion and downstream siltation.	Contractor CELO ECO	As necessary	
❖ Existing drifts and bridges may be used at the consent of the landowner. However, such structures must be examined for strength and durability before being used.	Contractor ECO	As necessary	
<ul style="list-style-type: none"> ❖ In the event of a need for new bridges and drifts to be constructed, approval must be sought from Eskom and the Landowner and this must be done in consultation with the ECO. ❖ An environmental authorization will be required under the National Environmental Management Act, 1998 (Act No.107 of 1998). 	Contractor ECO	As necessary	v
❖ All structures constructed for river access purposes shall be properly designed and drawings of such structures shall be available for record purposes.	Contractor	Continuous	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
	CELO ECO		
Management objectives		Measurable targets	
<ul style="list-style-type: none"> ▶ Minimize damage to river and stream embankments. ▶ Minimize erosion of embankments and subsequent siltation of rivers, streams and dams. 		<ul style="list-style-type: none"> ▶ No new access roads through river and stream banks ▶ No visible erosion scars on embankments once construction is completed 	
• Erosion and Donga Crossings			
❖ Where necessary, crossing of dongas and eroded areas shall be thoroughly planned.	Contractor CELO ECO	As necessary	
❖ Water diversion berms shall be installed at donga crossings to ensure water runoff does not run into dongas and cause or exacerbate an erosion hazard.	Contractor CELO ECO	As necessary	
❖ Suitable erosion containment structures shall be constructed at donga crossings where required and viable.	Contractor CELO ECO	As necessary	
❖ All structures shall be properly designed and drawings shall be available for reference purposes.		As necessary	
❖ No unplanned / improperly planned cutting of donga embankments are allowed as this leads to further erosion and degradation of the environment.	Contractor CELO ECO	Continuous	
❖ In general, soil disturbance should be kept to a minimum. The disturbance of land contour banks or other erosion control structures shall be avoided.	Contractor ECO	As necessary	
Management objectives		Measurable targets	
<ul style="list-style-type: none"> ▶ Minimize erosion damage on donga crossings. ▶ Minimize impeding the natural flow of water. ▶ Minimize initiation of erosion through donga embankments. 		<ul style="list-style-type: none"> ▶ No disturbance to donga embankments ▶ No erosion visible on donga embankments due to construction activities 	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
		▶ No interference with the natural flow of water	
<ul style="list-style-type: none"> • Landscaping and Re-vegetation 			
<ul style="list-style-type: none"> ❖ General disturbance of land surface will degrade by erosion. Permanent visual scarring will result. ❖ The Contractor shall rip all areas compacted by machinery, smooth off and integrate disturbed areas visually into surrounding landform using spoil rock and stockpiled top layer of soil. ❖ Where practically possible, the Contractor shall temporarily fence the area (with four strands of wire) until vegetation has been re-established to ensure that game and livestock do not have access to areas that are on slopes and on erodible soils. The fencing aspect shall be agreed with the landowner prior to erection. Consultation with landowner should be undertaken to determine the preferred rehabilitation strategy. 	Contractor ECO	As necessary	
<ul style="list-style-type: none"> ❖ The removal or picking of any protected or unprotected indigenous plants is not permitted without the applicable permits or outside the substation footprint. 	Contractor ECO	Continuous	
<ul style="list-style-type: none"> ❖ Areas where soils have been compacted shall be rehabilitated once construction is completed. 	Contractor ECO	As necessary	
<ul style="list-style-type: none"> ❖ All declared aliens shall be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). 	Contractor ECO	Continuous	
<ul style="list-style-type: none"> ❖ The establishment and re-growth of alien vegetation must be controlled after the removal of grass. 	Contractor ECO	As necessary	
<ul style="list-style-type: none"> ❖ No damage shall be caused to any farms unless both the landowner and the SS, prior to the work commencing agree upon the extent of the intended damage. ❖ While the presence of crops was not apparent at the time of the site visit, farms may change to crops at a later stage, either during construction or operation. 	Contractor ECO	As necessary	
<ul style="list-style-type: none"> • Landscaping, stabilisation and soil stockpiling 			
<ul style="list-style-type: none"> ❖ Exposed slopes and/or destabilized areas should be landscaped to blend in with the surrounding area. 	Contractor ECO	As necessary	
<ul style="list-style-type: none"> ❖ In exposed areas with slopes steeper than 1:3, re-vegetation should not be used as the primary means of stabilization. Such slopes should rather be stabilized by suitable 	Contractor ECO	As necessary	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
structures agreed to by the ECO which can be enhanced by re-vegetation to facilitate blending with the environment.			v
❖ Erosion of rehabilitated areas shall be prevented.	Contractor CELO ECO	As necessary	
• Re-vegetation			
❖ Exposed areas with slopes less than 1:3 should be rehabilitated with a grass mix that blends in with the surrounding vegetation.	Contractor CELO ECO	As necessary	
❖ The grass mix should consist of a mix of <i>Cynodon dactylon</i> (50%); <i>Eragrostis curvula</i> (30%) and the remainder should consist of other pioneer grass species suitable for the area (20%). The introduction of forbs from the Fabaceae family is also recommended.			
❖ In the local situation the areas that are re-vegetated will stand out amongst the grasses in the area.	Contractor CELO ECO	As necessary	
❖ Therefore, the re-vegetated areas should be properly fenced until the grass sward is well established to protect it from overgrazing and trampling by livestock and game.			
❖ The fertiliser should be applied conservatively, just enough in order to help the grasses to establish.			
❖ Re-vegetation should take place within the rainy season and water of a reasonable quality will have to be supplied as needed until the grasses reach the seed-filling stage.			
❖ The re-vegetated areas should be temporarily fenced, with agreement of the landowner (with four strands of wire) to prevent damage by grazing animals. Consultation with landowner should be undertaken to determine the preferred rehabilitation strategy.	Contractor CELO ECO	As necessary	
❖ Re-vegetated areas should be monitored every 4 months for the first 12 months and once a year thereafter for the maintenance period of two years.	Contractor	Continuous	
❖ Re-vegetated areas showing inadequate surface coverage (less than 30% coverage, 8 months after re-vegetation) should be prepared and re-vegetated from scratch.	Contractor CELO ECO	As necessary	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ Damage to re-vegetated areas should be repaired promptly.	Contractor ECO	As necessary	
❖ Exotic weeds and invaders that might establish on the re-vegetated areas should be controlled to allow the grasses to properly establish.	Contractor ECO	As necessary	
❖ Weed control methods should be confirmed with the PM to prevent any undesirable secondary impacts.	Contractor ECO	As necessary	
Management objectives		Measurable targets	
<ul style="list-style-type: none"> ▶ Minimize damage to vegetation. ▶ Minimize possibility of erosion due to removal of vegetation. ▶ Minimize removal of plant material on river and stream embankments. ▶ Eradication of alien invader species. ▶ Minimize scarring of the soil surface and land features. ▶ Minimize disturbance and loss of topsoil Rehabilitate all disturbed areas 		<ul style="list-style-type: none"> ▶ No vegetation interfering with structures as per statutory safety requirements, upon completion of the contract ▶ No de-stumping of vegetation on river and stream embankments ▶ All alien invaders removed ▶ No litigation due to unauthorized removal of vegetation ▶ No visible erosion scars once construction is completed ▶ No claims regarding damage leading to litigation ▶ All damaged areas successfully rehabilitated one year after completion 	
<ul style="list-style-type: none"> • Fauna Protection 			
❖ It is illegal to interfere with any wildlife or other fauna. All fauna occurring on-site shall be protected. Hunting and snaring must not be permitted.	Contractor ECO	Continuous	
❖ Construction camps must be fenced off to prevent wildlife from entering the sites.	Contractor CELO ECO	Prior to construction	
❖ 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.	Contractor CELO ECO	Continuous	
<ul style="list-style-type: none"> • Archaeology / Heritage 			

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ If any heritage/archaeological sites/objects are discovered during the construction or operational processes, the ECO or other relevant person on site should note the location of and ensure that such sites/objects are not disturbed/destroyed and contact the Eskom Environmental Advisor and South African Heritage Resources Association (SAHRA).	Contractor ECO	As necessary	
❖ In the event that any heritage/archaeological sites are discovered during construction they shall be demarcated with wire fencing with a radius of at least 30 m. Construction teams shall not be allowed access to these sites. ❖ No construction camps shall be allowed within 50 m of any known archaeological sites. ❖ The collection of heritage/archaeological objects/artefacts at identified sites shall not be allowed.	Contractor ECO	As necessary	✓
❖ Any destruction of a heritage site can only be allowed once a permit is obtained from SAHRA and the site has been mapped and noted. ❖ Permits shall be obtained from the SAHRA should the proposed line affect any heritage sites.	Contractor ECO	As necessary	
Management objectives		Measurable targets	
▶ The preservation and appropriate management of new archaeological finds, should these be discovered during construction.		▶ No destruction of or damage to new heritage sites	
• Infrastructure			
❖ All pipelines shall be clearly marked and protected. ❖ Any damage to pipe lines shall be repaired immediately and the cost will be for the contractors account.	Contractor ECO	As necessary	
❖ It is probable that the use of private roads for construction purposes would lead to damage due to heavy equipment and frequent use. The Contractor shall be responsible to repair roads if damaged. Photographs must be taken of the road prior and post use to prove the extent of the damage caused by construction activities. ❖ All existing private access roads used for construction purposes, shall be maintained at all times. This will ensure that the local people have free access to and from their properties.	Contractor ECO	As necessary	
❖ Some Landowners use electrically driven farming activities such as irrigation. Power cuts to facilitate construction shall be carefully planned. ❖ Disruptions shall be kept to a minimum. They should be well advertised and communicated	Contractor CELO ECO		

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
<p>to the Landowners prior to it the power being cut.</p> <ul style="list-style-type: none"> ❖ Care must be taken not to damage irrigation equipment, lines, channels and crops, as this could lead to major claims being instituted against Eskom and the Contractor. 		Prior to power cuts	
Management objectives		Measurable targets	
<ul style="list-style-type: none"> ▶ The control of temporary or permanent damage to landowner's equipment and installations. ▶ Control of interference with the normal operation of landowner's equipment and installations. ▶ Securing of the safe use of infrastructure, landowner's equipment and installations. 		<ul style="list-style-type: none"> ▶ No unplanned disruptions of services ▶ No damage to any plant or installations ▶ No complaints from authorities or Landowners regarding disruption of services ▶ No litigation due to losses of landowner's equipment, installations and crops 	
<ul style="list-style-type: none"> • Materials Use, Handling, Storage and Transport (Cement, Fuel [Petrol and Diesel] and Oils) 			
<ul style="list-style-type: none"> ❖ Procedures for material handling shall be discussed with and approved by the ECO. 	Contractor ECO	Once-off	
<ul style="list-style-type: none"> ❖ Relevant national, regional and local legislation regarding the transport, use and disposal of hazardous waste must be adhered to at all times. 	Contractor ECO	Continuous	
<ul style="list-style-type: none"> ❖ Hazardous waste generated during construction must be classified in terms of the Hazardous Substances Act. 	ECO Contractor	As necessary	
<ul style="list-style-type: none"> ❖ A permit must be obtained if the storage, handling, transporting and disposal of any hazardous waste are within the thresholds stated in the NEMWA. The permit will have specific conditions that must be adhered to in accordance with the hazardous waste class. 	ECO Contractor	As necessary	
<ul style="list-style-type: none"> ❖ Hazardous waste must be disposed of at either a licensed H:h or H:H waste disposal site depending on the class of hazardous waste being disposed . 	ECO Contractor	Continuous	
<ul style="list-style-type: none"> ❖ An emergency procedure to deal with accidents and incidents (e.g. spills) arising from hazardous substances shall be compiled and implemented. 	Contractor ECO	Once-off	v
<ul style="list-style-type: none"> ❖ All mechanical equipment used in construction activities shall be clean and free of oil, petrol, and diesel leaks. 	Contractor ECO	Continuous	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ Spills of hazardous substances, in excess of one litre shall be reported to the ECO immediately and the appointed Tx Services Environmental Advisor (Tx Key Performance Indicator requirement).	Contractor ECO	As necessary	
<ul style="list-style-type: none"> ❖ A register for spills and incidents involving hazardous materials shall be maintained. ❖ Soil or yard stone, which has been contaminated, shall be removed and disposed of at an approved waste disposal site. ❖ Alternatively, contaminated soil can be treated on site through bioremediation. Should a person experienced in bioremediation not be available on site, a specialist contractor shall be used. ❖ Such spills must be cleaned and remediated to the satisfaction of the ECO. ❖ A method statement is required from the Contractor that details the procedure to be followed in dealing with leaks or spills. 	Contractor CELO ECO	As necessary	√
❖ A complete emergency spill kit shall be available on site at all times. The Contractor must also ensure that relevant staff members are trained to use the emergency spill kit and on the manner in which to deal with spills of hazardous substances (oils, diesel or petrol).	Contractor ECO	Continuous	
❖ A concrete platform with a bund wall must be allocated to accommodate fuel, oil paint, bitumen, herbicide and insecticides to guard against infiltration of hazardous substances into the soil. Fuel tanks must be banded to hold 110% of the contents of the tank. The tanks shall be housed in a roofed area so that no water will collect within the bund wall.	Contractor ECO	Once-off	√
❖ All staff handling hazardous waste must be trained accordingly.	Contractor ECO	Once-off	
❖ All necessary approvals with respect to fuel storage and dispensing shall be obtained from the appropriate authorities.	Contractor ECO	As necessary	
❖ Areas of fuels storage and other flammable materials shall comply with standard fire safety regulations and will require the approval of the SS/CM and the local Fire Prevention Officer.	Contractor SS ECO	As necessary	
❖ No smoking shall be allowed in the vicinity of the stores and adequate fire-fighting equipment shall be accessible at fuel storage area and areas in the vicinity of the storage	Contractor	Continuous	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
area. "No smoking" and "Danger" signs shall be erected at hazardous substance storage areas.			
❖ All empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected.	Contractor	Continuous	
• Batching Plants			
❖ Concrete shall not be mixed directly on the ground.	Contractor ECO	Continuous	
❖ The concrete batching activity shall be located in an area of low environmental sensitivity. The site for the batch plant shall be indicated on the site layout program.	Contractor ECO	Once-off	√
❖ All wastewater resulting from batching of concrete shall be disposed of via the wastewater management system.	Contractor	Continuous	
❖ Suitable screening and containment must be in place to prevent windblown contamination from cement storage, mixing, loading and batching operations.	Contractor	Continuous	
❖ The Contractor shall be responsible for negotiating the site of his batching plant (if required) and the conditions under it may be established, with the landowner. The Contractor shall be responsible for the proper management of the batching plant.	Contractor CELO	As necessary	√
❖ The use of local water for concrete must first be negotiated with the landowner and the appropriate authorities. Such water is to be analyzed and accepted by the PM before use.	Contractor PM ECO	Prior to batching	
❖ Upon completion of works, the ground of the batching plant area shall be rehabilitated and the site cleaned and left as it was found and to the satisfaction of the SS and landowner.	Contractor ECO	Upon completion	
• Servicing of vehicles			
❖ Servicing of vehicles in the veld is strictly prohibited.	Contractor ECO	Continuous	
❖ Only emergency repairs shall be allowed on site and a drip tray shall be used to prevent oil spills.	Contractor ECO	As necessary	
❖ All vehicles shall be serviced in the designated area.	Contractor ECO	As necessary	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
<ul style="list-style-type: none"> ❖ In the event of a breakdown in the veld, any oil spills shall be cleaned up and the following shall apply: ❖ All contaminated soil shall be removed and be placed in containers. ❖ Contaminated soil can be taken to one central point at the Contractors campsite where bioremediation can be done. ❖ Smaller spills can be treated on site. ❖ A specialist Contractor shall be used for the bio-remediation of contaminated soil. ❖ The area around the fuel storage drum at the Contractor's campsite shall also be re-mediated upon completion of the contract ❖ All oil spills must be reported to the ECO and SS. 	Contractor ECO	As necessary	√
Management objective		Measurable targets	
<ul style="list-style-type: none"> ▶ Prevention of pollution of the environment. ▶ Minimize chances of transgression of the legislation controlling pollution. 		<ul style="list-style-type: none"> ▶ No pollution of the environment ▶ No litigation due to transgression of pollution control acts ▶ No complaints from Landowners 	
• Fire Prevention			
❖ The Contractor must document a fire reduction management plan. The plan will identify sources of fire hazards, and appropriate management measures to reduce the identified risk. The relevant authority will be notified of such potential fire hazards.	Contractor CELO	As necessary	
❖ No fires shall be allowed on site under any circumstance even for that of cooking in the manner indicated below (The Forest Act, No 122 of 1984).	Contractor CELO ECO	Continuous	
❖ In terms of the Atmospheric Pollution Prevention Act (APPA), burning is not permitted for waste disposal.	Contractor CELO ECO	Continuous	
❖ Accidental fires in natural grassland should be prevented through proper sensitization of the contractors and their workers towards the associated risks, dangers and damage of property.	Contractor ECO	Continuous	
❖ The Contractor shall have fire-fighting equipment, for each construction team readily available on site, especially during the winter months. The fire fighting equipment shall be	Contractor		

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
regularly checked and shall be approved by the ECO / Safety and Health Officer on site.	ECO	Continuous	
❖ An emergency preparedness Program should be in place in order to fight accidental veld fires, should they occur. The adjacent land owners/users/managers should also be informed and/or involved.	Contractor ECO	Continuous	√
❖ The use of open fires for cooking of food etc. by construction and maintenance personnel should be strictly prohibited. Temporary enclosed areas (windshield) for food preparation should be provided specifically for this reason. The Contractor shall supply alternative cooking facilities.	Contractor	Continuous	
❖ Use of branches of trees and shrubs for fire making purposes must be strictly prohibited. Penalties for the unnecessary removal and/or destruction of any plant for any reason (firewood, medicinal use, collector's value etc) should be agreed upon beforehand and be included in the contract.	Contractor ECO	Prior to construction	
Management objectives		Measurable targets	
<ul style="list-style-type: none"> ▶ Minimize risk of veld fires. ▶ Minimize damage to grazing. ▶ Prevent runaway fires. 		<ul style="list-style-type: none"> ▶ No veld fires started by the Contractor's work force ▶ No claims from Landowners for damages due to veld fires ▶ No litigation 	
• Emergency Procedures			
❖ Emergency procedures shall be set up prior to the commencement of work. It must include but not be limited to fires, spills, and contamination of ground and surface water, accidents to employees and damage to services.	Contractor ECO	Once-off	√
❖ Key staff shall be trained in emergency response and all staff made aware of the emergency procedures.	Contractor ECO	As necessary	
❖ A register of all incidents, accidents, etc. must be maintained, which includes the action taken after the event has occurred. The ECO must be informed of the event.	Contractor CELO ECO	Continuous	
❖ The site and all operations shall comply with all National Health and Safety Standards and other relevant national, regional and local regulations. Eskom shall appoint a Health and Safety (H&S) Officer.	Contractor ECO	Continuous	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ The Contractor is liable for any expenses incurred by any organizations called to assist with fighting fires and any cost relating to the rehabilitation of burnt areas/and/or properties and persons should the fire be the cause of the Contractor's activities on site.	Contractor ECO	As necessary	
❖ All equipment shall be user safe and vehicles shall be roadworthy.	Contractor ECO	Continuous	
• Health and safety			
❖ A medical and safety induction must be prepared and must be undertaken prior to entering the site.	Contractor	As necessary	
❖ No site staff other than security personnel shall be housed on site.	Contractor ECO	Continuous	
❖ Potable water and washing facilities shall be made available for all personnel.	Contractor ECO	Continuous	
❖ Public access to the construction site shall be prevented at all times.	Contractor ECO	Continuous	
❖ Portable toilets shall be provided on site. The toilets must be cleaned regularly and the number of toilets shall be based on a minimum ratio of 15 people per toilet.	Contractor ECO	Continuous	
❖ Designated eating areas shall be allocated.	Contractor ECO	Continuous	
❖ Staff must wear the necessary personal protective equipment.	Contractor ECO	Continuous	
❖ Daily clean up of working areas will take place and safety notices or tape placed in areas of danger	Contractor ECO	Continuous	
▪ Prevention of disease			
❖ All the necessary precautions against the spreading of disease, especially in farms with livestock and game, shall be taken.	Contractor ECO	Continuous	√
Management objective		Measurable target	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
<ul style="list-style-type: none"> ▶ Prevent litigation due to infestation of livestock or game. 		<ul style="list-style-type: none"> ▶ No complaints and claims from Landowners ▶ No litigation 	
<ul style="list-style-type: none"> • Waste management 			
❖ An on-site waste management program to prevent the spread of refuse within and beyond the site shall be developed and implemented.	Contractor SS ECO	Once-off	√
❖ Sufficient bins with secure lids for waste disposal purposes shall be provided. These bins must be emptied regularly. The waste must be disposed at a registered/ permitted waste disposal site.	Contractor ECO	Continuous	
❖ A daily clean-up of the site must be maintained.	Contractor ECO	Continuous	
❖ No waste shall be buried or burned on site. All solid waste collected on site shall be disposed of offsite at an appropriate permitted landfill site. Where a permitted landfill site is not available in proximity to the construction site, the Contractor must provide a method statement with regard to waste management.	Contractor ECO	Continuous	√
❖ Covered waste bins shall be supplied by the contractor.	Contractor ECO	As necessary	
❖ The site office and materials storage area must be kept neat and tidy and free of litter.	Contractor ECO	Continuous	
❖ Littering by the employees of the Contractor shall not be allowed.	Contractor ECO	Continuous	
❖ The Contractor shall collect all litter and dispose thereof in terms of the approved waste management Program.	Contractor ECO	Continuous	
❖ Refuse generated from the campsite, construction area, storage area or any other area shall be collected and placed in a skip on a daily basis.	Contractor ECO	Continuous	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ A litter patrol around the construction camp and work areas as well as along the alignment are to take place every day to collect any litter that may have been strewn around.	Contractor ECO	Continuous	
❖ A skip, with a cover, must be used to contain refuse from campsite bins, rubble and other construction material.	Contractor ECO	Continuous	
❖ Once full and on a regular basis, the contents of the skip must be disposed of at a permitted landfill site.	Contractor ECO	Continuous	
❖ No hazardous material, e.g. oil or diesel fuel shall be disposed of in any unregistered waste site.	Contractor ECO	Continuous	
❖ Material that may harm humans or animals must not be left on site.	Contractor ECO	Continuous	
❖ Any broken insulators shall be removed and all shards picked up. Broken, damaged and unused nuts, bolts and washers must be picked up and removed from site.	Contractor ECO	Continuous	
❖ The piling of any material that could rot and release unpleasant smells into the air will not be permitted.	Contractor ECO	Continuous	
❖ Surplus concrete may not be dumped indiscriminately on site, but must be disposed of at a licensed landfill site, or in designated areas agreed by the Landowner and ECO.	Contractor ECO	Continuous	
❖ Concrete trucks shall not be washed on site after depositing concrete into foundations. Any spilled concrete shall be cleaned up immediately.	Contractor CELO ECO	Continuous	
Management objectives		Measurable targets	
<ul style="list-style-type: none"> ▶ Neat workplace and site. ▶ Disposal of rubble and refuse in an appropriate manner. ▶ Minimize litigation. ▶ Minimize Landowner complaints. 		<ul style="list-style-type: none"> ▶ No complaints from Landowners ▶ No rubble or refuse lying around on site ▶ No incidents of litigation ▶ No complaints from Landowners ▶ No visible concrete spillage 	
<ul style="list-style-type: none"> ▪ Bird Flight Diverters 			

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
❖ In areas where there is a potential for bird collisions (especially rare or endangered species) with new overhead lines or where there are actual collisions on existing lines it is advisable to install bird flappers or bird flight diverters on the earth wires. Collisions should be reported to Eskom so that the matter can be resolved.	PM ECO Contractor	As necessary	
❖ Transmission shall use the <u>double loop bird flight diverter (BFD)</u> : <ul style="list-style-type: none"> • Black and white spirals are of preformed 14mm diameter PVC UV stabilized rod. • Half of the spirals must be of white colour and the other half must be of black colour. • Diverters should be fitted to the entire span 	PM ECO Contractor	As necessary	
❖ Installation of the bird flight diverters at specific spans as per the Avifaunal specialist report must be: <ul style="list-style-type: none"> • Installed on both earth wires, staggered; • Installed only on 60% of the span and in the middle of the span; and • On the lower middle lower span, spirals must be installed at 10 metre intervals on each earth wire and with alternating colours on each side. 	PM ECO Contractor	As necessary	
▪ Sanitation			
<ul style="list-style-type: none"> ❖ Ensure that proper sanitation is achieved ❖ No complaints received from Landowners regarding sanitation ❖ Regular cleaning of and emptying of sanitation equipment must take place ❖ All staff must be provided with adequate sanitation facilities and equipment. 	ECO Contractor	Continuous	√
▪ Destruction of heritage resources			
<ul style="list-style-type: none"> ❖ Construction personnel must be alert and must inform the local Council should they come across any findings. ❖ Should any additional archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, must cease immediately and the ECO must be notified as soon as possible. ❖ Upon receipt of such notification, the ECO must be notified and Eskom should arrange for the excavation to be examined by an Archaeologist as soon as possible. ❖ Under no circumstances shall archaeological artefacts be removed, destroyed or interfered with. ❖ Any archaeological sites exposed during construction or operational phases may not be 	ECO Contractor		

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
<p>disturbed prior to authorization by the South African Heritage Resources Agency. The removal, exhuming, destruction, altering or any other disturbances of heritage sites must be authorized by SAHRA in terms of the National Heritage Resources Act (Act No. 26 of 1999).</p>			
<p>▪ Traffic impact</p>			
<ul style="list-style-type: none"> ❖ Vehicular movement beyond the property boundaries should be limited during peak hour. Access to the site must follow current and established routes. ❖ It must be ensured that a backlog of traffic does not develop at the access points during peak hours, through the implementation of an efficient and effective access control system. ❖ Security fence is to inspected daily to ensure no illegal entry points are created. 	<p>ECO Contractor</p>	<p>As a Necessary</p>	
<p>▪ Crime, safety and security</p>			
<ul style="list-style-type: none"> ❖ Illegal occupants on the property must be removed to ensure no uncontrolled fires, cutting down of vegetation and littering. ❖ The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the National Building Regulations. ❖ Ensure the contacts details of the police or security company and ambulance services are available on the site. ❖ Ensure that the handling of equipments and materials is supervised and adequately instructed. ❖ Do not allow the movement of public within the development site by posting notices at the entrance gates, and where necessary on the boundary fence. ❖ Appropriate notification signs must be erected, warning the residents and visitors about the hazards around the construction site and presence of heavy vehicles. ❖ No collecting of wood or the removal of wood or any item not associated with the construction activities will be allowed. ❖ No picking, pouching or snaring and killing of any fauna or flora will be allowed. 	<p>ECO Contractor</p>	<p>Continuous</p>	
<p>▪ Atmospheric pollution</p>			
<ul style="list-style-type: none"> ❖ Dust production must be controlled by regular watering of roads and works area, should the need arise. ❖ Points of ingress and egress onto the site must be regularly cleaned for dust and mud. 	<p>ECO Contractor</p>	<p>As a necessary</p>	

Environmental Specification	Responsible Individual	Frequency	Method Statement Required
<ul style="list-style-type: none"> ❖ No refuse wastes are burnt on the premises or on surrounding premises. ❖ All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 30 km/h must be adhered to. ❖ Vehicles to be used during the construction phase are to be kept in good working condition so as not to be the source of excessive fumes and nuisance. 			
<p>▪ Social & Economic Benefits</p>			
<ul style="list-style-type: none"> ❖ Contractor will be encouraged to employ local people on work that does not requires specialized skills. ❖ Contractor must clearly emphasize to the general public that some work requires specialized skills and therefore contractor will bring skilled personnel for such work. ❖ Local community shall be informed about possible employment opportunities arising within the development in order to conflict between contractor and community. ❖ Impact on local communities due to construction activities will be limited as far as possible. No unnecessary noise or movement from access roads or corridors will be allowed. 	Contractor CELO	As a necessary	
<p>▪ Vegetation clearance and maintenance</p>			
<ul style="list-style-type: none"> ❖ Deep valleys and environmentally sensitive areas that restrict vehicle access, or legally protected areas, shall not be cleared of vegetation provided that the vegetation poses no threat to the safe operation and reliability of the power lines that enter the substation. ❖ It shall be ascertained from the property owners concerned whether they wish to retain the cut vegetation. If not, it shall be removed, or disposed of in an appropriate manner to the satisfaction of the owner. Burning shall not be permitted under any circumstance. 	Contractor ECO	As a necessary	

10. Site Specific Farms Affected and Special Landowner Conditions

The proposed Ngwedi (Mogwase) Main Transmission Substation (MTS) is situated on the following farms, for which there **are no special landowner conditions** that need to be considered for the CEMPR:

- Portion 1 of the farm Frischgewaad 96 JP

11. Site Specific Impact and Mitigation Measures

11.1. Biophysical Aspects

Activity	Surface water	Surface water Mitigation	Ecology (Flora and Fauna)	Ecology (Flora and Fauna) Mitigation	Avifauna	Avifauna Mitigation
Ngwedi Substation	Overlap with watercourse buffer	If possible, move the substation approximately 50m-100m to avoid overlap with 50m watercourse buffer.	No specific issues	No mitigation required	Ephemeral foraging habitat	Screen the area for breeding sandgrouse

11.2. Physical and Heritage Aspects

Activity	VIA	VIA Mitigation	Heritage	Heritage Mitigation
Ngwedi substation	Nearby drainage lines.	Special attention to erosion protection	No specific issues	No mitigation required

12. *Summarization of Site Specific Mitigation on Areas of Concern*

Locality Map (Figure 5) and entire study area

The area shown in **Figure 5** gives an overall view of the study area that specialists covered during walk down. The main concerns with the substation, that was found within various specialist studies, was the close proximity to a drainage area towards the east of the site. The ECO can refer to the map and table in **section 11** as to the issues triggered by the walk down and the specialist findings for the substation.

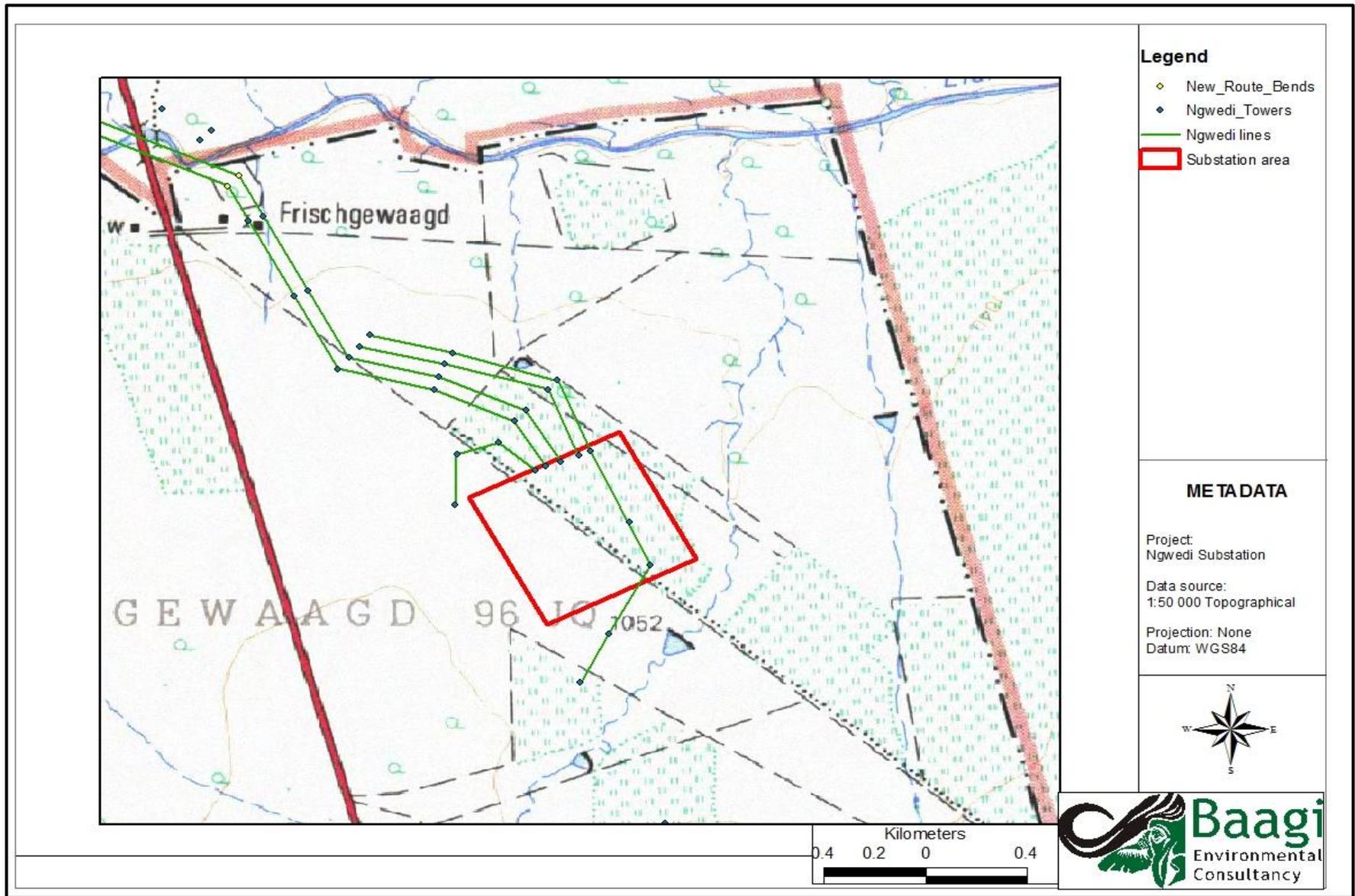


Figure 5 : Overall Study Area

C. SECTION 3: CONCLUSIONS

This Environmental Management Program should be used as an on-site reference document during all phases of this development, and auditing should take place in order to determine compliance with this CEMPR. Parties responsible for transgression of this CEMPR should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour / negligence should receive penalties.

Process facilitated the identification of relevant and practical mitigation measures, which may be used by the construction team and Eskom to draw up and respond to tender documentation. It is thus key to this process that this document be included during tendering to allow all potential bidders for this work to seriously consider and cost for such mitigation. This will ensure that the document receives the necessary buy in that it requires from the outset of the project.

This CEMPR was compiled in an iterative manner that allowed for a pre-screening of the substation by the specialist team. This enabled specialists to identify sensitive environmental features, such as drainage lines, areas susceptible to erosion and heritage artefacts.

The protected tree species found on site have been marked and will require permit if they are to be removed. It is however important to keep in mind that these trees, although accepted as protected species, do occur in the abundance in the site area. Seeds of the species will be found within the seed bank and will return and grow once the disturbance of the construction has been completed. The replacement ratio for the trees within this area can thus be low as they will recover to a certain extent themselves.

More important is the protection of big dead trees and the replacement of removed dead trees, as these trees are very important habitat, nesting and roosting, sites for birds. This issue is usually ignored when it comes to CEMP. If any dead trees, four meters or higher, are removed they must be replaced or replacement dead trees created.

In order to have records of environmental incidences and the handling thereof, it is suggested that incidence logs (**Appendix 1**) be filled in by the Environmental Control Officer or Environmental Liaison Officer. The contract manager needs to be informed of such incidences and further actions need to be taken, should the need arise.

APPENDIX 1: INCIDENT AND ENVIRONMENTAL LOG

ENVIRONMENTAL INCIDENT LOG				
Date	<i>Env. Condition</i>	Comments (Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)	Corrective Action Taken (Give details and attach documentation as far as possible)	<u>Signature</u>

APPENDIX 2: DECLARATION OF UNDERSTANDING BY DEVELOPER, ENGINEER AND CONTRACTOR

DECLARATION OF UNDERSTANDING BY THE DEVELOPER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Program for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

DECLARATION OF UNDERSTANDING BY THE ENGINEER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Program for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

DECLARATION OF UNDERSTANDING BY THE CONTRACTOR

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Program for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2:

APPENDIX 3: OIL SPILL CLEAN-UP AND REHABILITATION

APPENDIX 4: TRANSMISSION ENVIRONMENTAL POLICY

APPENDIX 5: RECORD OF DECISION

APPENDIX 6: SPECIALIST REPORTS

1. AVIFAUNA & FAUNA

2. FAUNA AND FLORA INCLUDING TREE MARKING REPORT

3. HIA REPORT

4. VIA REPORT

5. Wetland and Surface Water

APPENDIX 7: METHOD STATEMENTS

METHOD STATEMENT: **Solid Waste Management**

CONTRACT:..... DATE:.....

WHAT WORK IS TO BE UNDERTAKEN? [give a brief description of the works to be undertaken on site that will generate waste (hazardous and non-hazardous wastes)]: * Note: please attach extra pages if more space is required.

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT: Solid Waste Management (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: **End Date:**.....

HOW IS WASTE TO BE MANAGED ON SITE? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement Solid Waste Management (contd.)
(SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ (Signed) (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ (Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

METHOD STATEMENT:

Crew Camps and Construction Lay Down Areas

CONTRACT:..... **DATE:**.....

WHAT CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS ARE REQUIRED ON SITE DURING CONSTRUCTION? (give a brief description of these): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS TO BE LOCATED? (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT:

Crew Camps and Construction Lay Down Areas (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:..... **End Date:**.....

HOW ARE CREW CAMPS AND CONSTRUCTION LAY DOWN AREAS TO BE MANAGED?
(provide as much detail as possible, including annotated sketches and plans where possible):

* Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Crew Camps and Construction Lay Down Areas (contd.) (SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated:.._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated:.._____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to

and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

METHOD STATEMENT:

Workshop and Maintenance/Cleaning of Plant

CONTRACT:..... **DATE:**.....

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

WHERE ARE THE WORKSHOPS AND CLEANING BAYS TO BE LOCATED? (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT:

Workshop and Maintenance/Cleaning of Plant (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:..... **End Date:**.....

HOW ARE WORKSHOPS AND PLANT MAINTENANCE/CLEANING TO BE MANAGED DURING CONSTRUCTION? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Workshop and Maintenance/Cleaning of Plant (contd.) (SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

ANNEXURE 4 D (SAMPLE)

METHOD STATEMENT: Cement and Concrete Batching

CONTRACT:..... **DATE:**.....

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Cement and Concrete Batching (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:.....

End Date:.....

HOW ARE THE WORKS TO BE UNDERTAKEN? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

DECLARATIONS for Method Statement

Cement and Concrete Batching (contd.) (SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

METHOD STATEMENT: Dust Control

CONTRACT:..... **DATE:**.....

WHAT WORK IS TO BE UNDERTAKEN ON SITE THAT COULD GENERATE DUST? (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT: Duct Control (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:.... End Date:.....

HOW ARE THE WORKS TO BE UNDERTAKEN SO AS TO MINIMISE AND CONTROL DUST GENERATION ON SITE? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Dust Control (contd.) (SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ (Signed) (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ (Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

METHOD STATEMENT:

Hydrocarbon and Emergency Spill Procedure

CONTRACT:..... **DATE:**.....

WHAT HAZARDOUS SUBSTANCES (INCL. FUELS) ARE TO BE STORED ON SITE? (give a brief description of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

WHERE ARE THE THESE SUBSTANCES TO BE STORED ON SITE? (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Hydrocarbon and Emergency Spill Procedures (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: **End Date:**.....

HOW ARE HAZARDOUS SUBSTANCES TO BE MANAGED TO AVOID SPILLAGES AND WHAT EMERGENCY PROCEDURES ARE TO BE IMPLEMENTED IN CASE OF A SPILLAGE? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Hydrocarbon and Emergency Spill Procedures (contd.) (SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

METHOD STATEMENT:

Diesel Tanks and Re-fuelling Procedures

CONTRACT:..... **DATE:**.....

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the number and capacity of diesel tanks to be kept on site): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT:

Diesel Tanks and Re-fuelling Procedures (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: **End Date:**.....

HOW ARE DIESEL TANKS TO BE MANAGED AND RE-FUELLING TO BE UNDERTAKEN?
(provide as much detail as possible, including annotated sketches and plans where possible):

* Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Diesel Tanks and Re-fuelling Procedure (contd.) (SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

METHOD STATEMENT:

Sourcing, Excavating, Transporting and Dumping of Fill and Spoil Material

CONTRACT:..... **DATE:**.....

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT:

Sourcing, Excavating, Transporting and Dumping of Fill and Spoil Material (Contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: **End Date:**.....

HOW ARE THE WORKS TO BE UNDERTAKEN? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Sourcing, Excavating, Transporting and Dumping of Fill and Spoil Material (Contd.)

(SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ (Signed) (Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ (Signed) (Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

METHOD STATEMENT:

Topsoil Management

CONTRACT:..... **DATE:**.....

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works to be undertaken that require topsoil to be stripped): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT:

Topsoil Management (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:..... **End Date:**.....

HOW ARE TOPSOIL STOCKPILES TO BE MANAGED? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Topsoil Management (contd.) (SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated:_____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated:_____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

METHOD STATEMENT:

Fire Management

CONTRACT:..... **DATE:**.....

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

*Insert additional pages as required

METHOD STATEMENT:

Fire Management (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: **End Date:**.....

HOW ARE THE WORKS TO BE UNDERTAKEN? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Fire Management (contd.) (SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

METHOD STATEMENT:

Rehabilitation of Crew Camps and Other Disturbed Areas

CONTRACT:..... **DATE:**.....

WHAT WORK IS TO BE UNDERTAKEN? (give a brief description of works to be undertaken that may result in the need for rehabilitation of the affected areas): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

WHERE ARE THE WORKS TO BE UNDERTAKEN? (where possible, provide an annotated Program and a full description of the extent of the works): * Note: please attach extra pages if more space is required

***Insert additional pages as required**

METHOD STATEMENT:

Rehabilitation of Crew Camps and Other Disturbed Areas (contd.)

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: **End Date:**.....

HOW ARE THE REHABILITATION WORKS TO BE UNDERTAKEN? (provide as much detail as possible, including annotated sketches and plans where possible): * Note: please attach extra pages if more space is required

*Insert additional pages as required

DECLARATIONS for Method Statement

Rehabilitation of Crew Camps and Other Disturbed Areas (contd.)

(SAMPLE)

1) ENGINEER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated:.._____

2) ECO

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

(Signed)

(Print name)

Dated: _____

2) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____

APPENDIX 8: GATE INSTALLATION GUIDELINES

APPENDIX 9: ACCESS TO FARMS REPORT

APPENDIX 10: VEGETATION CLEARANCE GUIDELINES REPORT