ENVIRONMENTAL MANAGEMENT PLAN FOR THE CONSTRUCTION OF TWO DOUBLE - CIRCUIT 400 KV TURN – INS TRANSMISSION POWER LINES FROM THE EXISTING KOEBERG-AURORA 400 KV TRANSMISSION LINE AND THE NEW ATLANTIS SUBSTATION

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GLOSSARY OF TERMS AND ABBREVIATIONS

EMP:

Environmental Management Plan. A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life-cycle of a project. This EMP focuses primarily on the construction phase of the proposed project.

ENVIRONMENT:

In terms of the National Environmental Management Act (No 107 of 1998) (NEMA), 'environment" means the surroundings within which humans exist and that are made up of:

(i) the land, water and atmosphere of the earth;
(ii) micro-organisms, plant and animal life;
(iii) any part or combination of (i) or (ii) and the interrelationships among and between them; and
(iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

ESKOM'S PROJECT MANAGER:

The person appointed by Eskom from time to time to act in the capacity and notified, by name and in writing by Eskom to the contractor, to act as required in the contract.

CLERK OF WORKS:

The person appointed by Eskom from time to time to act in the capacity of site manager, and whose authority shall be notified in writing to the Contractor by Eskom's Project Manager, and is responsible for managing the construction process on site.

ENVIRONMENTAL CONTROL OFFICER:

An individual nominated through the Project Manager to be present on site to act on behalf of the Project Manager in matters concerning the implementation and day to day monitoring of the EMP. The Environmental Control Officer is assumed to be the regional Environmental Practitioner appointed by Eskom.

CONTRACTOR:

A person or company appointed by Eskom to carry out stipulated activities.

ENVIRONMENTAL IMPACT

A change to the environment, whether adverse or beneficial, wholly or partially, resulting from an organisation's activities, products or services.

INCIDENT

An undesired event which may result in a significant environmental impact but can be managed through internal response.

EMERGENCY

An undesired event that does result in a significant environmental impact and requires the notification of the relevant statutory body, such as a local authority.

1. INTRODUCTION

In order to supplement the need for new peaking electricity generation capacity, with a short lead-time to commercial operation, Eskom Holdings Limited (Eskom) have received authorisation to construct an Open Cycle Gas Turbine (OCGT) Power Station at a site within Atlantis Industria in the Western Cape Province. This facility will utilise liquid distillate fuel or natural gas as a fuel source. In order to integrate this proposed power station into the existing National Transmission Network, Eskom further proposes the construction of a new substation and two double - circuit 400 kV Transmission power lines in parallel between the existing Koeberg-Aurora Transmission power lines and the proposed Atlantis Substation.

1.1. Overview of the Proposed Project

The project includes the construction of a new OCGT Power station, a new substation and two double - circuit 400 kV Transmission power lines in parallel between the new substation and the existing Koeberg-Aurora 400 kV Transmission power lines, within Atlantis Industria in the Western Cape Province. This EMP focuses on the construction phase for the two double circuits 400 kV Transmission power lines.

1.1.1. OCGT Power Station

An Open Cycle Gas Turbine (OCGT) Power Station consists of a combustion chamber, a compressor, a gas turbine and a generator. The compressor and the gas turbine are mounted on the same shaft. The compressor draws fresh air from the atmosphere and increases the air pressure, by compressing it, before sending this air to the combustion chamber. At the combustion chamber fuel is added to the compressed air and the total mixture is combusted, resulting in hot gas entering the turbine at a temperature greater than 1300ºC. This hot gas imparts the majority of its energy via a turbine to both the compressor and a generator. The open cycle gas turbine discharges exhaust gases and heat to the atmosphere.

The OCGT Power station is required to be sited on a technically feasible site. A technical pre-feasibility study undertaken by Eskom (and independently reviewed by Mark Wood through Ninham Shand), therefore considered land availability and land-use compatibility, load variances in the area, fuel availability and costs, ease of integration with, and impacts on the existing National Transmission Network, impacts on the Transmission network, and benefits to transmission load variances in order to determine feasible sites.

The OCGT Power station at Atlantis is proposed to consist of 3-5 units, each with a nominal capacity of between approximately 120 MW – 250 MW each. The total nominal capacity of the power plant is proposed to be a maximum of 1 000 MW. Being a peak capacity plant, the OCGT will only be required to operate during those times when

electricity is in its highest demand, i.e. for approximately 2 hours in the morning (07h00 to 09h00) and 2 hours in the evening (18h00 to 20h00). If necessary the plant can operate for up to 8-hour shifts. In emergency situations, the power station can operate for a 24-hour period.

1.1.2. Integration into National Transmission Network

In order to integrate this new plant into the existing National Transmission Network, the establishment of the OCGT Power station will be associated with a new Transmission substation and Transmission power lines. The integration of this power station into the National Transmission Network must be undertaken with the least risk to the existing network in terms of network losses and fault levels. A preferred option for this integration has been identified through a pre-engineering study undertaken by Eskom (Eskom Transmission, 2004), which involves the turn-in and out of both existing Koeberg-Aurora 400 kV Transmission power lines to the proposed Atlantis Transmission substation. The following infrastructure is required:

- The construction of a new substation at the Atlantis OCGT site. The substation will be accommodated within the 20 ha area which is required for the OCGT Power station and associated infrastructure. An area of 9 ha is required for the substation high voltage yard. The tallest substation infrastructure will be approximately 45 m in height.
- The establishment of two double - circuit 400 kV Transmission power lines between the new substation and the existing Koeberg-Aurora 400 kV Transmission power lines. It is proposed that the two Koeberg-Aurora 400 kV Transmission power lines will be turned in and out of the Atlantis site. The required servitude width is 110 m.

1.2. Environmental Study Requirements

In terms of the Environmental Impact Assessment (EIA) Regulations, Eskom Holdings Limited required authorisation from the Western Cape Department of Environmental Affairs and Development Planning (WC D:EA&DP) for the undertaking of the proposed project. In order to obtain authorisation for all aspects of this project, comprehensive, independent environmental studies were undertaken in accordance with the EIA Regulations.

The environmental studies followed a two-phased approach in accordance with the EIA Regulations published in terms of the Environment Conservation Act (No 73 of 1989) i.e.:

- Phase 1: Environmental Scoping Study
- Phase 2: Environmental Impact Assessment (EIA)

The Environmental Scoping Study identified and evaluated potential environmental impacts associated with all aspects of the proposed project. In terms of the EIA

Regulations, feasible Transmission line alternatives were considered within the Scoping Study. Recommendations regarding further studies required within the EIA phase of the project (for the OCGT Power station, and the transmission substation and Transmission power lines) were made. An alternative site for the OCGT plant was identified through public consultation. This site was investigated in detail within the EIA phase of the project.

The environmental impact assessment included detailed studies for the two sites nominated for investigation, during the Scoping phase of the project, as well as for the 400 kV Transmission power lines and substation to be constructed in conjunction with the OCGT facility. This EIA aimed to assess potential environmental impacts (both social and biophysical) associated with the proposed project, and recommend appropriate and practical mitigation and management measures, where required.

1.3. Environmental Management Plan

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

The Environmental Control Officer (ECO) shall convey the contents of this document, the conditions of the Record of Decision (RoD) from W C DEAD & P, as well as Landowner special conditions to the Contractor site staff and discuss the contents in detail with the Eskom Project Manager and Contractor at a pre-construction meeting. This formal induction training is a requirement of ISO 14001 and shall be done with all main and sub-contractors. Record of the training date, people whom attended and discussion points shall be kept by the ECO.

The Environmental Control Officer shall make contact with the local Extension Officer of the Western Cape Department of Environmental Affairs and Development Planning and the Chairpersons of Farmers Associations (where applicable) where the route traverses, as these contacts have valuable information about the local area.

Most Landowners will see the construction period as interference with their daily activities. There will be a negative attitude towards the whole construction process. Landowners are always apprehensive toward changes they do not control. Good relations with Landowners need to be established and sustained. Landowners shall therefore be informed timeously of the construction programme, duration and all interference with their daily activities. This will help in the solving of problems and the prevention thereof. Lines of communication should always be open to ensure proper and timeous reaction to complaints. The contact numbers of the ECO and CECO shall be made available to Landowners. The reputation of both the Contractor and Eskom Transmission is at stake and should be the drive for everybody involved to perform in excellence.

All Environmentally sensitive areas are indicated within the Environmental Impact Assessment Report and the Project Manager and Contractor shall take note of these. The Contractor shall take all the necessary precautions against damage.

During the construction period at least two Environmental Audits shall be conducted to determine compliance with the recommendations of the EIA, EMP and conditions of the RoD. These can be internal audits or external by DEAT, ISO14001 auditors or combined audits.

1.3.1. Applicable Documentation

The following environmental documentation is applicable for the project, and should be read in conjunction with this EMP:

- Environmental Scoping Report for the proposed new OCGT Plant and Associated Transmission power lines and substation at Atlantis, Western Cape Province.
- Environmental Impact Assessment Report for the proposed new OCGT Plant and Associated Transmission power lines and substation at Atlantis, Western Cape Province.
- Record of Decision issued by the Western Cape Department of Environmental Affairs and Development Planning (WC DEADP) (refer Appendix A).

1.3.2. Structure of the Environmental Management Plan

The EMP provides mitigation and management principles for the Construction Phase of the project. Environmental actions, procedures and responsibilities as required within the construction phase are specified. These specifications shall form part of the contract documentation and, therefore, the Contractor will be required to comply with the specifications to the satisfaction of the Project Manager and Environmental Control Officer, in terms of the construction contract.

Relevant environmental legislation pertaining to the project is listed within Appendix B. The Contractor is required to comply with this legislation for all phases of the project. This list is intended to serve as a guideline only for the Contractor and is not exhaustive.

It should be noted that this EMP is a dynamic document which should be updated as required on a continuous basis. Any amendments made must be submitted to both the Environmental Control Officer (or the Regional Environmental Manager) and Project Manager for approval prior to implementation.

1.3.3. Objectives of the EMP

The EMP has the following objectives:

- To outline functions and responsibilities of responsible persons.
- To state standards and guidelines which are required to be achieved in terms of environmental legislation.
- To outline mitigation measures and environmental specifications which are required to be implemented for the construction phase of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts.
- To prevent long-term or permanent environmental degradation.

2. SCOPE

The scope of this document is to give environmental management guidelines, to the Contractor constructing the Transmission power lines and substation, in fulfilment of ISO 14001 requirements. This document will form part of the contract and supplementary to Eskom's TRMSCAAC1 REV 3 (refer Appendix C). The recommendations and constraints, as set out in this document are enforceable under the general conditions of contract.

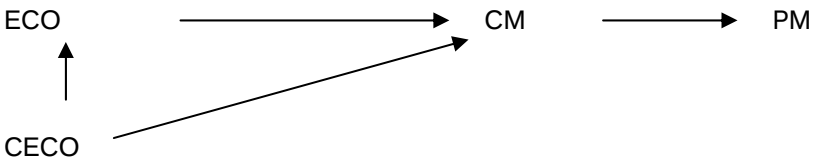
The management programme has a long-term objective to ensure that:

- Environmental Management conditions and requirements are implemented from the start of the project,
- Precautions against damage and claims arising from damage are taken timeously, and
- The completion date of the contract is not delayed due to problems with Landowners arising during the course of construction.

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

- Take into consideration the Landowner special conditions where the line traverses private property.
- To underwrite Eskom Transmission's Environmental Policy TRMPBAAX3 Rev 2 (refer Appendix D) at all times.
- Ensure environmental conditions stipulated in the Record of Decision (ROD) are implemented.
- Resolve problems and claims arising from damage immediately to ensure a smooth flow of operations.
- To implement this Environmental Management Programme (EMP) for the benefit of all involved.
- To preserve the natural environment by limiting destructive actions on site.

2.1. Reporting Structure.



ECO: Environmental Control Officer (Can be the Eskom Site Supervisor depending on the size of the project)
C: Contractor
CM: Contract Manager (Eskom)
CECO: Contractor Environmental Control Officer (Dedicated person)

PM: Project Manager (Eskom)

2.2. Responsibility Matrix.

Function	Name / Cell No.	Responsibility
Project Manager (PM) Eskom	Peter Ramaite 082 852 4529	Overall management of project and EMP implementation
Site Supervisor/ Contract Manager (CM) Eskom	Please provide details when avail	Oversees site works, liaison with Contractor, PM and ECO
Environmental Control Officer (ECO) Eskom	Please provide details when avail	Implementation of EMP and liaison between Eskom, Contractor and Landowners
Contractor (C)	Please provide details when avail	Implementation and compliance with recommendations and conditions of the EMP, Appoints dedicated person (CELO) to work with ECO
Contractor Environmental Control Officer (CECO)	Please provide details when avail	Implementation of EMP, landowner interaction, environmental control of site actions, re-mediation and rehabilitation work.
Transmission Services Environmental Advisor (Eskom)	Mamokete Mafumo 011 800 2621 082 902 7166	Environmental advice and auditing

(Table to be completed upon Contract award)

2.3. Functions and Responsibilities

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Project Manager, Clerk of Works and Environmental Control Officer for this project are as detailed below.

The Project Manager / Manager will:

- ensure that Eskom and the Contractor are aware of all specifications, legal constraints and Eskom standards and procedures pertaining to the project specifically with regard to the environment.
- ensure that all stipulations within the EMP are communicated and adhered to by Eskom and its contractor(s).
- monitor the implementation of the EMP throughout the project by means of site inspections and meetings. This should be documented as part of the site meeting minutes.
- be fully conversant with the Environmental Scoping Report for the project, the conditions of the RoD, and all relevant environmental legislation.

The Clerk of Works (Eskom's Representative) will:

- be fully conversant with the Environmental Scoping Report.
- be fully conversant with the Environmental Impact Assessment Report.
- be fully conversant with the conditions of the RoD.
- be fully conversant with the Environmental Management Plan.
- be fully conversant with all relevant environmental legislation and Eskom environmental policies and procedures, and ensure compliance with these.
- have overall responsibility for the implementation of the EMP.
- conduct audits to ensure compliance to the EMP.
- liase with the Project Manager or his delegate, the Environmental Control Officer and relevant discipline Engineers on matters concerning the environment.
- prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution on the site.
- confine activities to the demarcated construction site.

The Environmental Control Officer will:

- be fully conversant with the Environmental Scoping Report.
- be fully conversant with the Environmental Impact Assessment Report.
- be fully conversant with the conditions of the RoD.
- be fully conversant with the Environmental Management Plan.
- be fully conversant with all relevant environmental legislation and Eskom environmental policies and procedures, and ensure compliance with them.
- undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMP.
- take appropriate action if the specifications are not followed.
- monitor and verify that environmental impacts are kept to a minimum, as far as possible.
- review and approve construction methods, with input from the Clerk of Works, where necessary.
- ensure that activities on site comply with all relevant environmental legislation.
- order the removal of person(s) and/or equipment in contravention of the specifications of the EMP.
- compile progress reports on a regular basis, with input from the Clerk of Works, for submission to the Project Manager, including a final post-construction audit.
- liase with the Clerk of Works regarding the monitoring of the site.
- report any non-compliance or remedial measures that need to be applied.

Contractors and Service Providers:

All contractors (including subcontractors and staff) and service providers are ultimately responsible for:

- complying with the environmental management specifications;

- submitting an obligatory Methods Statement for approval by the ECO before any work is undertaken;
- adhering to any instructions issued by the Engineer/Project Manager on the advice of the ECO;
- submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting
- displaying the list of transgressions issued by the ECO in the site office
- maintaining a public complaints register.
- arrange that all his employees and those of his subcontractors receive training before the commencement of construction in order that they:

3. TECHNICAL SPECIFICATIONS

(ESKOM PLEASE TO VERIFY THIS SECTION AND PROVIDE DETAILS WHERE NECESSARY)

3.1. Transmission power lines

3.1.1. Length

The length of the lines will be approximately 2, 4 km in length.

3.1.2. Construction Area

The servitude width for each double – circuit Transmission line is 55 m, 27,5 m either side of the centre line. Construction will be limited to the width of the servitude in which the line will be constructed.

3.1.3. Tower Parameters

- Tower spacing : 200 m (Average)
- Tower height : 38 m (Average)
- Conductor attachment height :Bottom phase - 17m ,middle phase - 25m ,top phase - 33m . (Average)
- Minimum ground clearance : 8.2 m.

3.1.4. Tower Design

The Contractor shall ensure that the correct equipment for construction purposes is available at all times to ensure construction proceeds without unnecessary damage to the environment. Should alternative methods be used, it requires approval from site staff and the ECO must be informed to ensure environmental issues are addressed.

3.1.5. Major Activities of the Project

The project involves 20 major activities of which 5 are completed. These are:

1) Environmental Impact Study – Copy of RoD appended to this document (see Appendix A).
2) Negotiations for the servitude.
3) Land survey to determine the exact routing of the line and tower placement.
4) Profiling work to produce the profiles for construction.
5) Pegging of bend tower by a Transmission surveyor.

The following activities are still to be performed and will take approximately 5 months to complete:

6) Erection of camp sites for the Contractors' workforce.
7) Vegetation clearing to facilitate access, construction and the safe operation of the line.
8) Establishing of access roads on the servitude where required as per design parameters in TRMSCAAC1 rev 3 (refer Appendix C).
9) Pegging of tower positions for construction by the contractor.
10) Transportation of equipment, materials and personnel to site and stores.
11) Installation of foundations for the towers.
12) Tower assembly and erection.
13) Conductor stringing and regulation.
14) Taking over the line from the contractor for commissioning.
15) Final inspection of the line, commissioning and hand over to the Grid Line and Servitude Manager for operation.
16) Rehabilitation of disturbed areas.
17) Signing off of all Landowners upon completion of the construction and rehabilitation.
18) Handing over and taking over of the servitude by the Grid Environmental Manager.
19) Operation and maintenance of the line by the Grid.
20) The final inspection for the release of the Contractors' guarantee takes place one year after completion of the project. The line will be in operation immediately after completion of the project and will stay operational for the lifetime of the plant. Subsequent maintenance and refurbishment can extend the operational lifetime of the plant substantially.

3.1.6. Project Execution Area

Construction activities must be limited to an area to be demarcated by Eskom and shown on the site plans, to be produced by the contractor. Any area outside the Eskom servitude area, required to facilitate access, construction activities, construction camps or material storage areas, shall be negotiated with the affected Landowners and written agreements shall be obtained. All construction areas shall be cleared in accordance with the Eskom Standard for Bushclearing ESKASABG3 (refer Appendix E). Any extra space to be cleared outside the servitude shall be negotiated with the relevant Landowners and approved by Eskom. All areas marked as no go areas inside the servitude shall be treated with the utmost care and responsibility.

No work shall commence until permission is granted from the Environmental Advisor from Transmission Services. The Project Manager shall ensure that all conditions in the RoD are fulfilled before the Contractor occupies the site. The Grid shall be kept informed

of all developments on construction at all times. All the requirements from the Grid must be considered during the construction phase to ensure smooth transition.

3.2. Substation

The substation where the work will be performed is the Atlantis Open Cycle Gas Turbine (OCGT) site, to be situated within the broader 20 ha area demarcated for the Atlantis OCGT Power Station.

3.2.1. Project Execution Area

Construction activities are limited to the area as demarcated by Eskom and shown on the site plans, to be produced by the contractor. Any area outside Eskom owned property, required to facilitate access, construction camps or material storage areas, shall be negotiated with the Landowners (where applicable) and written agreements shall be obtained.

In the case of this new substation, the works area shall be fenced to prevent livestock or local community members from wandering onto site and getting injured. All works shall be limited to the fenced area and the Contractor workforce shall refrain from venturing outside this area onto private property.

No work shall commence until permission is granted from the Environmental Advisor from Transmission. The Project Manager shall ensure that all conditions in the RoD are fulfilled before the Contractor occupies the site.

4. ENVIRONMENTAL GUIDELINES, STANDARDS AND PERMITS

4.1. Environmental Guidelines and Standards

All applicable environmental standards contained within the environmental legislation shall be adhered to. Relevant environmental legislation pertaining to the project is listed within Appendix B. The Contractor is required to comply with this legislation for all phases of the project. This list is intended to serve as a guideline only for the Contractor and is not exhaustive.

4.2. Environmental Permitting Requirements

Environmental permits which will be required to be obtained for construction are discussed briefly below. These will be required to be obtained before construction commences.

4.2.1. Protected Plants

In terms of the National Forest Act (No 84 of 1998) and Government Notice 1339 of 6 August 1976 (promulgated under the Forest Act (No 122 of 1984) for protected tree species), the removal, relocation or pruning of any protected plants will require a permit.

Protected indigenous plants in general are controlled under the relevant Provincial Ordinances or Acts dealing with nature conservation, i.e. Transvaal Nature Conservation Ordinance (No 12 of 1983). Included within the provincial Ordinance is the legislation regarding the plant species on the Red Data list.

Due to the fact that no protected plants were identified on site during the impact assessment, the above regulation will only be applicable in the event that a protected plant is identified during the final survey.

4.2.2. Abstraction of Water

If water is to be abstracted from a public stream during construction (for construction activities), a permit is required from the Minister of Water Affairs and Forestry. If water is to be abstracted from water of which the rights of use belong to private landowners, it will be necessary to establish whether their water use rights are still valid in terms of the provisions of the National Water Act, negotiate with the relevant landowners and then to obtain a water use permit from DWAF in terms of Section 21, 40 and 41 of the National Water Act (No 36 of 1998).

4.2.3. Heritage Sites

In terms of the National Heritage Resources Act (No 25 of 1999), a permit is required to be obtained for the disturbance, removal or destruction of any national and provincial

heritage sites, archaeological and palaeontological sites, burial grounds and graves and public monuments and memorials. The demolition or dismantling of all man-made structures and buildings older than 60 years is subject to the approval of the relevant provincial heritage council under the National Heritage Council Act (No 11 of 1999).

4.2.4. Waste Disposal

All waste (general and hazardous) generated during the construction of the powerline and substation may only be disposed of at appropriately licensed waste disposal sites (in terms of Section 20 of the Environment Conservation Act, No 73 of 1989). Cognisance must also be taken of the relevant provincial legislation in this regard. It should be noted that all controlling authority regulations pertaining to litter in terms of the Environment Conservation Act (sections 19, 19A and 24A) have been delegated to the provinces.

4.2.5. Public Health

Soak-aways, french drains and other similar types of sewage effluent and human waste disposal facilities must be approved by the nearest local authority in terms of their by-laws and relevant provincial standard by-laws. These facilities do not fall under provisions of the National Water Act (No 25 of 1999).

5. CONSTRUCTION ACTIVITIES

5.1. Contractor Selection and Performance

- Eskom must ensure that this EMP forms part of any contractual agreements with sub-contractors for the execution of the proposed project
- The contractor must monitor the performance of the construction team from time to time to ensure compliance with the requirements of this EMP

5.2. Legal and Other Requirements

- Eskom and the Contractor must commit themselves to comply with the relevant provisions of the applicable environmental legislation and associated regulations promulgated in terms of these laws.
- The client must enter into agreement with the local authority concerning any requirements directed towards protecting the environment. Contractors will be required to respect and comply with such agreements.

5.3. Social Interaction

- All neighbours must be notified and advised of the timing of the intended construction activities.
- A community liaison officer/Communications Practitioner from Eskom will deal with community needs and complaints.
- Open liaison channels with nearby residents and Interested and Affected Parties (I&APs) must be developed in order to facilitate communication and field concerns or complaints about construction activities, working hour's etc.
- The construction camp must be planned in detail, such that affected parties do not feel threatened by the presence of construction workers.
- Contractors must prevent and prohibit their employees from entering neighbouring land and homes.
- The Contractor must construct and maintain adequate fencing around the camp and ensure that materials used for construction on the site do not blow on or move outside the site and environs.
- All construction activities must take place within the demarcated footprint. If it is necessary for activities to take place outside of this area, permission must be obtained from the ECO.
- Ensure that the entire camp site(s) is fenced, that access into and out of the camp is controlled and that gates are locked after hours and over weekends.
- Movement of construction personnel on site, outside of the demarcated development areas, must be strictly prohibited.

5.4. Labour

- Normal working hours must be maintained. Proposed normal working hours are between 06h00 and 18h00 Monday to Friday.
- Night-time activities must be limited as far as possible, and construction activities must be contained to reasonable hours during the day and early evening.
- Construction time limits must be implemented for noisy construction activities. Surrounding communities must be informed of the timing of such noisy activities.
- Construction outside working hours must be approved by the Community Liaison Officer/SHE Officer and the affected community must be informed accordingly
- The Contractor must inform all adjacent landowners of any after-hour construction activities and any other activity that could cause a nuisance e.g. the application of chemicals to the work surface. Arrangements are to be made with the Client and Local Authorities/community leaders for after-hours work.
- The Contractor will maintain records of time worked, wages paid and training to show compliance.

5.5. Safety and Security

5.5.1. General Procedures

The Contractor will ensure the implementation of the following safety and security measures:

- Clearly mark dangerous areas and restrict access to these areas.
- Ensure compliance with the Occupational Health and Safety Act (No 85 of 1993).
- Ensure that no person under the influence of alcohol or narcotic substances is permitted to work on the site.
- Ensure adequate signage is provided along the major roads and at the entrance of the construction site.
- In terms of construction worker safety, safety management plans must be implemented.
- Community safety & community safety concerns are to be addressed by the Contractor.

5.6. Site Establishment

Site establishment shall take place in an orderly manner and all amenities shall be installed before the main workforce move onto site. A method statement is required from the Contractor at tender stage that includes the layout of the camp, management of ablution facilities and wastewater management. The Contractor camp shall have the necessary ablution facilities with chemical toilets where such facilities are not available at commencement of construction. The Contractor shall supply a wastewater management system that will comply with legal requirements and be acceptable to Eskom.

Where Eskom facilities are available the Contractor shall make use of such facilities where it is viable and possible. The Contractor shall inform all site staff to the use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities.

The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at a registered waste dump. A certificate of disposal shall be obtained by the Contractor and kept on file. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may solid waste be burned on site unless a suitable incinerator is available.

5.6.1. Construction Site Layout Plan

Once the alignment of the Transmission power lines and the positioning of the towers and the exact position of the substation have been finalised, the Contractor shall develop a construction layout plan, indicating the intended use of the site, and shall include:

- The extent of the servitude and substation area.
- Site access during construction (including all entry and exit points).
- Two metre interval contour lines.
- The route and the extent of access necessary to reach each tower position.

In addition, the following shall be indicated by the contractor:

- All material and equipment storage areas (including storage areas for hazardous substances such as fuel, cement and herbicides).
- Construction offices and other structures (if required).
- Security requirements (including temporary and permanent fencing and lighting) and accommodation for security staff.
- Areas where vegetation is required to be cleared.
- Areas where material is to be stockpiled (including construction materials and topsoil).
- Solid waste collection facilities.
- Temporary construction phase stormwater control measures.
- Areas which require slope stabilisation during construction.
- Provision of potable water and temporary ablution facilities for construction personnel.

The construction area should be clearly demarcated on the site plan, and all other areas must be considered no-go areas for the construction personnel.

Only designated areas may be used for the storage of construction material, topsoil, machinery, equipment and establishment of site offices.

The construction layout plan shall be made available to the Clerk of Works (Eskom's representative) for written approval. Throughout the period of construction, the Contractor shall restrict all activities to within the approved areas on the construction layout plan. Construction activities should be limited to the servitude areas.

5.6.2. Site Camp(s) and Construction Staff

The Contractor shall be responsible for negotiating the site camps(s) and conditions under which the site may be established with the relevant landowner(s) (if required). Prior to the establishment of the site camp(s), the Contractor shall produce a plan showing the positions of all buildings, vehicle wash areas, fuel and cement storage areas and other infrastructure for approval of the Clerk of Works.

The Contractor will be required to provide a motivational memorandum should more than one site camp be considered necessary for this project.

A signboard should be placed in the area of construction informing the public of the construction activities taking place.

Construction staff must be adequately educated by the Environmental Control Officer or the Clerk of Works as to the provisions included in the EMP and general environmentally friendly practice.

The conduct of on-site workers must be specified to the Contractor by Eskom. Specifications are to include sanitation, water and waste (litter), as well as informal trading and interfering in local community/cultural affairs. The following activities will be disallowed at site camp(s), and by the construction staff in general:

- The irresponsible use of welding equipment, oxy-acetylene torches and other naked flames which could result in veld fires or constitute a hazard.
- Indiscriminate disposal of rubbish or rubble.
- Littering of the site.
- Spillage of potential pollutants, such as petroleum products.
- Collection of firewood.
- Lighting of fires for cooking, heating or other purposes, and failure to exterminate any fires.
- Interference with any wildlife, fauna or flora.
- Poaching of any description.
- Use of any facility other than the chemical toilets provided.
- Burning of wastes and cleared vegetation under any circumstances.
- The use of rivers, streams, dams or any watercourses/surface water for washing purposes.
- Entering areas outside of the demarcated construction area.

- The presence of construction staff at the construction site outside of the designated construction times (6:00 to 18:00), i.e. no construction staff are allowed to overnight on site, outside of the demarcated construction camp.

The Contractor shall:

- Ensure that the entire camp site(s) is fenced and that gates are locked after hours and over weekends in order to prevent ad hoc access to the site by the public and the associated risk to personal safety.
- Ensure that firebreaks are made and maintained along the inside perimeter of the fence (where appropriate). This will be particularly important in areas where forestry activities are being undertaken.
- Ensure that appropriate sanitation (such as chemical toilets) and cooking facilities are provided and maintained at all work sites.
- No open fires will be permitted on the construction sites without the authority of the Environmental Control Officer. Food cooking shall be done in areas designated by the Environmental Control Officer.

The establishment of fencing and firebreaks must be negotiated with the relevant landowner(s).

The contractor must ensure that workers are educated about HIV/AIDS and that condoms are readily distributed. The local health services are to participate in order to ensure the implementation of education/condom distribution programmes.

5.6.3. Materials Handling, Use and Storage

The Contractor shall:

- Ensure that any delivery drivers are appropriately supervised by an individual familiar with all procedures and restrictions on site. This is of particular importance during off and on-loading of materials.
- Ensure that only designated areas are used for the handling or storage of construction materials.

5.7. Waste Management

The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at a registered waste dump. A certificate of disposal shall be obtained by the Contractor and kept on file. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. The disposal of waste shall be in accordance with all relevant legislation. Under no circumstances may solid waste be burned on site unless a suitable incinerator is available.

5.8. Workshop and Equipment Storage Areas

Where possible and practical all maintenance of vehicles and equipment shall take place in the workshop area. During servicing of vehicles or equipment, a suitable drip tray shall be used to prevent spills onto the soil, especially where emergency repairs are effected outside the workshop area. Leaking equipment shall be repaired immediately or be removed from site to facilitate repair. All potentially hazardous and non-degradable waste shall be collected and removed to a registered waste site. A certificate of disposal shall be obtained by the Contractor and kept on file.

Workshop areas shall be monitored for oil and fuel spills and such spills shall be cleaned and re-mediated to the satisfaction of the ECO. The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site.

The following shall apply to hazardous substance spills:

- All contaminated soil / yard stone shall be removed and be placed in containers. Contaminated material can be taken to one central point where bio-remediation can be done.
- Smaller spills can be treated on site.
- A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site.
- All spills of hazardous substances must be reported to the ECO and appointed Transmission Services Environmental Advisor.

5.9. Storage Areas of Hazardous Substances

All hazardous substances shall be stored in suitable containers and storage areas shall be bunded. This includes all carbon substances like fuel and oil as well as herbicides and battery acid. A register shall be kept on all substances and be available for inspection at all times. Areas shall be monitored for spills and any spills shall be contained, cleaned and rehabilitated immediately. Any leaking containers shall be repaired or removed from site (See above for actions after spills).

The Contractor shall ensure the implementation of the following procedures for the management of hazardous substances:

- Identify and maintain a register of all activities that involve the handling of potentially hazardous substances, as well as devise and supervise the implementation of protocols for the handling of these substances. This will include all fuels, oils, lubricants and grease.
- Ensure that all hazardous substances are handled in accordance with the manufacturer's specifications, legal requirements and Eskom's procedures.

- Store all hazardous substances (including oils, fuels, chemicals, etc.) in a manner prescribed in the relevant Acts and Regulations, namely the Environment Conservation Act (Act 73 of 1989), the Hazardous Substances Act (Act 15 of 1973) and the National Water Act (Act 54 of 1956).
- Implement appropriate actions and measures to reduce, stop or contain a spill of potentially hazardous substances (e.g. fuel or lubricating oil).
- Implement appropriate actions and measures to reduce or prevent contamination of the ground and surface water as a result of a spill of potentially hazardous substances.
- Arrange and supervise the implementation of clean-up operations and appropriate disposal of contaminated materials at a licensed hazardous waste disposal site.
- Keep written records detailing the type of spill, the corrective and remedial measures implemented in the stopping or reduction of the spill, and the clean up of the spill. Such progress reporting is important for monitoring and auditing purposes and the written reports may afterwards be used for training purposes in an effort to prevent similar future occurrences.
- Report the nature and extent of the spill to the Environmental Advisor, the Clerk of Works and/or Project Manager as soon as reasonably possible, but within 24 hours.

The Environmental Control Officer shall prescribe measures to be implemented in order to prevent spills of potentially hazardous substances.

5.10. Terrain

5.10.1. Transmission power lines

The land in question is presently undeveloped but was disturbed in the past (1970's) when a network of roads and railway lines were put in place when the Atlantis area was initially developed as an industrial township. These facilities are under-utilised and the proposed Atlantis Station and goods yard lies vacant. Stands of alien vegetation have taken over the disturbed areas and encroached onto the recent windblown sands (Witsand formation) which generally characterize the area.

- Management objectives
  - Minimise scarring of the soil surface and land features
  - Minimise disturbance and loss of topsoil
  - Rehabilitate all disturbed areas along the servitude

- Measurable targets
  - No visible erosion scars once construction is completed
  - No claims regarding damage leading to litigation
  - All damaged areas successfully rehabilitated one year after completion

5.10.2. Substation

Where terracing is required, topsoil shall be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone. Such areas include terrace embankments and areas outside the high voltage yards. Where required, all sloped areas shall be re-vegetated and stabilised to ensure proper rehabilitation is effected. These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of steep embankments. The contract design specifications and Environmental Impact Report (EIR) recommendations shall be adhered to and implemented strictly.

The retained topsoil shall be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion. Where required re-vegetation can also be enhanced using a grass seed mixture as described in section 5.20 (Rehabilitation) of this EMP.

- Management objectives
  - Minimise scarring of the soil surface and land features other than on site
  - Minimise disturbance and loss of topsoil from site
  - Rehabilitate all disturbed areas in the substation area

- Measurable targets
  - No visible erosion scars once construction is completed
  - All disturbed areas successfully rehabilitated

5.11. Natural Drainage's

The site occurs within quaternary catchment G21B (304 km^2 in extent) of the Berg Water Management Area. The area is largely devoid of rivers and streams. The most significant surface water drainage feature is the south westerly draining Donkergat River located within 6 km of the study area to the southeast (Figure 4.1). The Donkergat River itself is a major tributary of the Sout River, which enters the Atlantic Ocean at Melkbosstrand. These drainages account in large measure for the mean annual runoff (MAR) of 31,6 million cubic metres associated with quaternary catchment G21B. A very much smaller drainage, the Buffels River, occurs in the Silwerstroom area to the northwest (Figure 4.1). All streams in the study area have an ephemeral character.

A high-yielding spring (approx. 30 L/s) is located at Silwerstroom on the coast, and another at Mamre. Both of these features serve as sources of potable water. Silwerstroom is utilised by the City of Cape Town, and the spring at Mamre represents the original source of water for the Mission Station established there in 1808.

Under no circumstances shall the contractor interfere with any watercourses in the vicinity of the site. Should deviation of such watercourses be required as part of the contract design specification, the specifications shall be adhered to strictly. The

Environmental Control Officer shall ensure that all watercourses are adequately protected to prevent downstream siltation due to erosion on site. Rubble from the construction process shall be removed from site and may under no circumstances be dumped into any natural drainage channels. The normal flow of runoff water must not be impeded, as this will enhance erosion.

- Management objectives
  - Avoid damage to natural drainage channels
  - Minimise erosion of embankments and subsequent siltation of rivers and streams

- Measurable targets
  - No damage to natural drainage channels
  - No visible erosion scars on embankments once construction is completed

5.12. Access Roads

5.12.1. Transmission power lines

Planning of access routes must be done in conjunction between the Contractor, Eskom and the Landowner. All agreements reached shall be documented in writing and no verbal agreements should be made. The condition of existing access / private roads to be used shall be documented with photographs.

The Contractor shall properly mark all access roads. Markers shall show the direction of travel as well as tower numbers to which the road leads. Roads not to be used shall be marked with a " NO ENTRY " sign (refer also TRMSCAAC1 REV 3). Where required, speed limits shall be indicated on the roads. All speed limits shall be strictly adhered to at all time.

Where new access roads are constructed, this must be done in accordance with TRMSCAAC1 REV 3 section4.4. Water diversion berms shall be installed from the start of the contract in accordance with TRMSCAAC1 REV 3 section 4.6. These berms shall be maintained at all times and be repaired at the end of the contract. 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.

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.

The installation of concrete pipes and drifts, to facilitate access, shall be at the discretion of the Environmental Control Officer on site. All structures shall be properly designed and

drawings shall be available for reference purposes. Any dangerous crossings shall be marked as such and where necessary, speed limits shall be enforced.

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 seed mixture should comply with the parameters as set out in section 5.20 of this document. Again, this is just a guideline, and through those areas where the vegetation clearing will take place west of the railway track it may be necessary to reseed depending on how much natural vegetation is removed.

- Management objectives
  - Minimise damage to existing access roads
  - Minimise damage to environment due to construction of new access roads
  - Minimise loss of topsoil and enhancement of erosion

- Measurable targets
  - No claims from Landowners due to damage on existing 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

5.12.2. Substation

Planning of access routes to the site for construction purposes shall be done in conjunction between the Contractor, Eskom and the Landowner. All agreements reached should be documented and no verbal agreements should be made. The normal Eskom site documentation will be sufficient for this purpose. The Contractor shall properly mark all access roads. Roads not to be used shall be marked with a " NO ENTRY " sign.

Where new access roads are constructed, this must be done according to design and contract specifications. Drainage channels shall be suitably designed to ensure erosion does not occur, especially at the outflows. The new access road shall be designed to allow for the natural flow of water where required. All areas susceptible to erosion shall be protected with suitable erosion control measures from the onset of the project. Prevention is the total aim as restoration is normally very difficult and costly.

Where necessary suitable measures shall be taken to rehabilitate damaged areas next to the newly constructed road.

- Management objectives
  - Minimise damage to existing access roads
  - Minimise damage to environment due to construction of new access roads
  - Minimise loss of topsoil and enhancement of erosion
  - Minimise impeding the natural flow of water

- Measurable targets
  - No claims from Landowners due to damage on existing access roads
  - No erosion visible on access roads three months after completion of construction
  - No loss of topsoil due to runoff water on access roads
  - No interference with the natural flow of water

5.13. Rubble and Refuse Disposal

The Contractor shall dispose of all excess material on site in an appropriate manner and at a designated place. All packaging material shall be removed from site and disposed of and not burned on site. No landfill may be used without the consent from the Landowner. Should a landfill be used for biodegradable materials only, the rubble shall be compacted and at least 1m of soil shall cover the waste material. No hazardous material, e.g. oil or diesel fuel shall be disposed of in any unregistered waste site.

No material shall be left on site that may harm man or animals. Any broken insulators shall be removed and all shards picked up. Broken, damaged and unused nuts, bolts and washers shall be picked up and removed from site. Surplus concrete may not be dumped indiscriminately on site, but shall be disposed of in designated areas as agreed by the Landowner. Concrete trucks shall not be washed on site after depositing concrete into foundations. Any spilled concrete shall be cleaned up immediately.

- Management objectives
  - To keep the servitude neat and clean
  - Disposal of rubble and refuse in an appropriate manner
  - Minimise litigation
  - Minimise Landowner complaints

- Measurable targets
  - No rubble or refuse lying around on site
  - No incidents of litigation
  - No complaints from Landowners
  - No visible concrete spillage on the servitude

5.14. Vegetation Clearing

The initial site visit clearly indicated the development of an OCGT Power Station and associated 400 kV Transmission power lines and substation at the Atlantis site to have a low impact on the natural vegetation, mainly because of the high current levels of disturbance and transformation of the natural vegetation. However, the Atlantis site is situated within a vegetation type which are described by various botanical scientists as threatened, mainly due to human pressure (e.g. urban & industrial sprawl and agriculture). Any development is this area should, therefore, be approached with caution. The following recommendations are put forward in the light of this:

- The permanent loss of vegetation within the footprint area cannot be prevented. It can, however, be minimised:
  - Construction activities should be restricted to the minimum area needed.
  - Complete removal of all excavated material and construction rubble after construction is completed.
- Loss of rare, endangered and/or protected species: As indicated above no listed species were found at any of the areas demarcated for the tower structures. The final placement of the remaining tower structures will be within an area which is largely invaded by alien acacia species and the occurrence of red data species along these sections are highly unlikely. Final inspection of all tower sites should be done by a competent person within the ECO company prior construction of the tower structures - especially of the sites that were not indicated yet during the last site visit. Any species found should be relocated after consultation with the Department of Nature Conservation.
- The site to be developed, along with the access routes and associated structures and transmission corridor should be marked temporarily (hazard tape). The indigenous plants within these areas should be removed to an established nursery (or one set out on the site) for use in the rehabilitation of disturbed areas after construction. A plant search and rescue operation can be done with the help of the local botanical society, universities and the Dept. Nature Conservation.
- An alien control and monitoring program must be developed starting during the construction phase and to be carried over into the operational phase. This has to be done specifically within the power line servitude.
- Disturbance of natural vegetation along the access routes and around the site etc. through trampling, compaction by motor vehicles etc. This is seen as a short-term impact that can be minimised:
  - Optimal use should be made of existing access roads.
  - Construction of new access roads should be minimised.
  - After completion of construction, all access roads that will not be used for future maintenance of the station and the transmission servitude should be rehabilitated and re-vegetated if necessary to blend in with the surrounding vegetation.
  - Areas on construction sites that were visibly compacted by construction activities should be ripped to allow re-establishment of natural vegetation.
- Access roads as well as the OCGT plant should not disturb the natural drainage patterns. Full use should be made of the existing storm water system in the design of the OCGT
- Pollution of the surface and or ground water with petrol, diesel, oil, cement, paint, litter etc., secondarily affecting the vegetation of the receiving environment.
  - Construction activities should be limited to the substation station site and servitude areas.
  - Movement by construction personnel outside of the demarcated development areas should be strictly prohibited.

- Adequate numbers and placement of portable chemical toilet facilities at construction sites is crucial to prevent unnecessary pollution of the surrounding vegetation. A ratio of one for fifteen personnel is proposed.
- Littering, specifically of the natural areas, should be prevented. Adequate containers for litter removal should be supplied on site. These containers should be emptied on a regular basis and the contents removed to an appropriate and licensed waste disposal site.
- After completion of construction, the site should be properly cleaned of any construction waste, litter etc. and properly rehabilitated/re-vegetated.

- Risk of fire: The risk of accidental fires to occur during the construction phase are considered to be high, especially during the dry summer months.
  - Accidental fires should be prevented through proper sensitisation of the contractors and their workers towards the associated risks, dangers and damage of property.
  - An emergency preparedness plan should be in place to fight accidental veld fires should they occur. The adjacent land owners/users/managers should also be informed and/or involved.
  - The use of open fires for cooking of food etc. by construction personnel should be strictly prohibited. Enclosed areas for food preparation must be provided.
  - Use of branches of indigenous trees and shrubs for fire making purposes must be strictly prohibited.

5.14.1. Transmission power lines

The object of vegetation clearing is to trim, cut or clear the minimum number of trees and vegetation necessary for the safe mechanical construction and electrical operation of the transmission line. Vegetation clearing shall be done in accordance with ESKASABG3 REV 0 (Standard for bush clearance and maintenance within overhead power line servitudes) and the Vegetation Management Guideline (refer Appendix F). Only an 8m strip may be cleared flush with the ground to allow vehicular passage during construction.

No scalping shall be allowed on any part of the servitude road unless absolutely necessary. The removal of all economically valuable trees or vegetation shall be negotiated with the Landowner before such vegetation is removed. All trees and vegetation cleared from the site shall be cut into manageable lengths and neatly stacked at regular intervals along the line. No vegetation shall be pushed into heaps or left lying all over the servitude.

Vegetation clearing on tower sites must be kept to a minimum. Big trees with large root systems shall be cut manually and removed, as the use of a bulldozer will cause major damage to the soil when the root systems are removed. Stumps shall be treated with herbicide. Smaller vegetation can be flattened with a machine, but the blade should be

kept above ground level to prevent scalping. Any vegetation cleared on a tower site shall be removed or flattened and not be pushed to form an embankment around the tower.

No vegetation clearing in the form of de-stumping, scalping or uprooting shall be allowed on river- and stream banks. Vegetation shall only be cut to allow for the passage of the pilot-cables and headboard. No vegetation clearing shall be allowed across ravines and gullies, as this vegetation will very rarely interfere with the clearance to the strung conductor. Trees and vegetation not interfering with the statutory clearance to the conductors can be left under the line. Dense vegetation under the line which could cause a fire hazard, particularly in the middle third of the span in the vicinity of the lowest point of the conductors, will be considered as a separate case. With permission of the landowner, the total servitude under the line and up to 5m outside the outer phases can be cleared.

Protected or endangered species of plants shall not be removed unless they are interfering with a structure. Where such species have to be removed due to interference with a structure, the necessary permission and permits shall be obtained from Provincial Nature Conservation. All protected species not to be removed must be clearly marked and such areas fenced off if required.

The use of herbicides shall only be allowed after a proper investigation into the necessity, the type to be used, the long-term effects and the effectiveness of the agent. Eskom's approval for the use of herbicides is mandatory (Contact Dr. Eugene van Rensburg—Vegetation Management). Application shall be under the direct supervision of a qualified technician. All surplus herbicide shall be disposed of in accordance with the supplier's specifications.

Upon completion of the stringing operations and before handover, the servitude must be inspected and all vegetation interfering with the safe operation of the line shall be removed / cut down. All alien vegetation in the total servitude and densifiers creating a fire hazard shall be cleared and treated with herbicides, in accordance with Eskom's Herbicide Policy. (refer Appendix G).

It is recommended that a contractor for vegetation clearing should comply with the following parameters:

- The contractor must have the necessary knowledge to be able to identify protected species as well as species not interfering with the operation of the line due to their height and growth rate.
- The contractor must also be able to identify declared weeds and alien species that can be totally eradicated.
- The contractor must be in possession of a valid herbicide applicators licence.

- Management objective

- Minimise damage to vegetation
- Keep servitude as natural looking as possible
- Minimise interference by vegetation to flow of electricity
- Minimise possibility of erosion due to removal of vegetation
- Minimise removal of plant material on river and stream embankments
- Eradication of alien invader and densifier species that cause a fire hazard

- Measurable targets
  - Only 8m vegetation cleared along the centre of the servitude for access purposes
  - No vegetation interfering with structures and statutory safety requirements upon completion of the contract
  - No de-stumping of vegetation on river and stream embankments
  - All alien invaders and densifiers removed to limit the fire hazard
  - No visible herbicide damage to the vegetation along the servitude one year after completion of the contract due to incorrect herbicide use
  - No litigation due to unauthorised removal of vegetation

5.14.2. Substation

Vegetation clearing to allow for site establishment as well as construction purposes will sometimes be required. Vegetation can be cleared mechanically with a bulldozer where terracing is required, but should be cleared by hand on other areas. All alien vegetation shall be eradicated from site during the project. Indigenous vegetation that does not pose any risks to the operation of the substation upon completion of the contract should be retained for esthetical purposes. Such vegetation shall be identified during design and clearly indicated on the site plans.

Protected or endangered species of plants shall be retained where possible. Where such species have to be removed due to interference with structures, the necessary permission and permits shall be obtained by the ECO from Provincial Nature Conservation prior to commencement of site works. Search, rescue and replanting of indigenous, valuable and protected species is highly recommended where possible and viable. After the final walk through of the proposed substation site and transmission line alignment was undertaken by an ecology specialist, it is not anticipated that any protected plant species will be found within the proposed construction site.

The use of herbicides shall only be allowed after a proper investigation into the type to be used, the long-term effects and the effectiveness of the agent. Eskom's guidelines regarding the use of herbicides (refer Appendix G) shall be adhered to strictly. Application shall be under the direct supervision of a qualified technician. All surplus herbicide shall be disposed of in accordance with the Supplier’s specifications.

The Contractor for vegetation clearing shall comply with the following parameters:

- The contractor must have the necessary knowledge to be able to identify different species.
- The contractor must be able to identify declared weeds and alien species that can be totally eradicated.
- The contractor must be in possession of a valid herbicide applicators licence.

The Contractor shall supply a method statement regarding vegetation clearing at the tender stage.

NATURAL FEATURES SHALL BE TAKEN INTO CONSIDERATION DURING DESIGN AND WHERE POSSIBLE THESE SHALL BE PROTECTED UNLESS THEY WILL INTERFERE WITH THE OPERATION OF THE SUBSTATION.

- Management objectives
  - Minimise unnecessary damage to vegetation
  - Keep site as natural looking as possible
  - Minimise possibility of erosion due to removal of vegetation
  - Minimise removal of plant material on river and stream embankments
  - Minimise damage to natural features

- Measurable targets
  - Only vegetation cleared as required for site construction purposes
  - No vegetation interfering with structures and statutory requirements upon completion of the contract
  - No de-stumping of vegetation on river and stream embankments
  - No visible erosion scars three months after completion of the contract due to vegetation removal
  - No visible damage to the vegetation outside the site one year after completion of the contract due to herbicide leaching
  - No litigation due to unauthorised removal of vegetation
  - No unnecessary damage to natural features

5.15. Gate Installation and Gate Control

The contractor is referred to the Fencing Act, Act no 31 of 1963. Gate installation shall be according to TRMSCAAC1 REV 3 section 4.5 and the drawing 0.00/10261 Rev 2 as stated in the specifications. All gates installed in electrified fencing shall be re-electrified. The Environmental Control Officer shall approve gate positions. All gate positions shall be three (3) metres off centre to allow for continued access when stringing takes place.

All gates shall be fitted with locks and be kept locked at all times during the construction phase. Gates shall only be left open on request of the Landowner if he accepts partial responsibility for such gates in writing, once the Contractor have left site and the gates are fitted with Eskom locks. Such gates shall be clearly marked by painting the posts

green. All claims arising from gates left open shall be investigated and settled in full by the Contractor. If any fencing interferes with the construction process, such fencing shall be deviated / protected until construction is completed.

- Management objective
  - Properly installed gates to allow access to the servitude
  - Minimise damage to fences
  - Limit access to Eskom and Contractor personnel with gate keys

- Measurable targets
  - 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

5.16. Fencing Requirements

The site shall be fenced to prevent any loss or injury to persons or livestock during the construction phase. All Eskom gates shall be fitted with locks and be kept locked at all times during the construction phase, especially when works are stopped during weekends and holidays. All claims arising from gates left open shall be investigated and if at fault, settled in full by the Contractor. If any fencing interferes with the construction process, such fencing shall be deviated until construction is completed. The deviation of fences shall be negotiated and agreed with the landowner in writing.

- Management objectives
  - Properly installed gates to allow access to the site
  - Minimise damage to private fences
  - Limit access to Eskom and Contractor personnel

- Measurable targets
  - No transgressions of the fencing act and therefore no litigation
  - No damage to fences and subsequent complaints from Landowners
  - All gates kept locked at all times to limit access to construction staff

5.17. Fire Prevention

No open fires shall be allowed on site under any circumstance (The Forest Act, No 122 of 1984, TRMSCAAC1 REV 3 section4.1.2). The Contractor shall have fire-fighting equipment available on all vehicles working on site, especially during the winter months.

The Contractor shall:

- Take reasonable and active steps to avoid increasing the risk of fire through his activities on site. Accidental fires should be prevented through proper sensitisation of the contractors and their workers towards the associated risks, dangers and damage of property. Fires will only be allowed within designated areas. Fir extinguishers should be made available, and all workers should be informed of their location and shown how to use them.
- Ensure that no fires are lit on site under any circumstances. The use of open fires for cooking of food, etc. by construction personnel should be strictly prohibited. Enclosed areas for food preparation must be provided.
- Report any fires which occur to the Environmental Control Officer as soon as possible.
- Ensure that there is basic fire-fighting equipment available on site at all times.
- Educate specific members of the construction force regarding the location and use of fire-fighting equipment.
- Restrict smoking activities to demarcated smoking areas.
- Ensure that an emergency preparedness plan is 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.
- The use of branches of trees and shrubs for fire-making purposes must be strictly prohibited.

- Management objective
  - Minimise risk of veld fires
  - Minimise damage to grazing
  - Prevent runaway fires

- Measurable targets
  - No veld fires started by the Contractor's work force
  - No claims from Landowners for damages due to veld fires
  - No litigation

5.18. Noise Control

The Contractor shall:

- Take all necessary steps to minimise noise generation within the Contractors area of responsibility.
- Limit "noisy activities" (e.g. drilling) to daylight hours.
- Compile a list of all activities, vehicles and equipment likely to generate excessive noise during the construction phase.
- Provide all equipment with standard silencers and maintain silencer units on vehicles and equipment in good working order, where necessary.

- If blasting is required, times should be negotiated with nearby landowners/community members such that they can take appropriate steps to safeguard domestic animals and children. All surrounding structures should be checked for stability prior to blasting.

As far as possible, any drilling and other construction activities should be limited to normal working hours. All machinery must be maintained in good working order, in compliance with generally accepted noise levels. Any high impact activity would require prior warning to adjacent community members.

- Management objectives
  - Prevention of noise pollution
  - Minimise nuisance factor of construction activities

- Measurable targets
  - No complaints from landowner or community
  - No litigation

5.19. Servicing of Vehicles

Servicing of vehicles in the veld is strictly prohibited. Only emergency repairs shall be allowed on site and a drip tray shall be used to prevent oil spills. All vehicles shall be serviced in the designated area inside the Contractors camp. In the event of a breakdown in the veld, any oil spills shall be cleaned up immediately. 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 bio-remediation can be done.
- Smaller spills can be treated on site.
- A specialist Contractor shall be used for the bio-remediation of contaminated soil.
- The area around the fuel storage drum at the Contractor's campsite shall also be re-mediated upon completion of the contract

All old parts, packaging, old oil, etc. shall be disposed of in the correct manner and in a proper area designated for such waste materials. Under no circumstances shall such waste be buried on site indiscriminately.

- Management objective
  - Prevention of pollution of the environment
  - Minimise chances of transgression of the acts controlling pollution

- Measurable targets
  - No pollution of the environment

- No litigation due to transgression of pollution control acts
- No complaints from Landowners

5.20. Rehabilitation

5.20.1. Tower Positions

Refer to TRMSCAAC1 REV 3 SECTION 4.4.5 for specifications concerning tower sites on slopes. Disturbance of topsoil on tower sites with severe slopes shall be minimised at all costs. At any tower sites where conventional foundations are installed, the Contractor shall remove the topsoil separately and store it for later use during rehabilitation of such tower sites. During backfilling operations, the Contractor shall take care not to dump the topsoil in the bottom of the foundation and then put spoil on top of that.

Re-seeding shall be done on disturbed areas as directed by the Environmental Control Officer. In accordance with the Conservation of Agricultural Resources Act, No 43 of 1983, slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced. Other methods of rehabilitation of tower sites may also be used at the discretion of the Environmental Control Officer, e.g. stone pitching, logging, etc. Contour banks shall be spaced according to the slope on tower sites. The type of soil shall also be taken into consideration.

A mixture of seed can be used provided the mixture is carefully selected to ensure the following:

- Annual and perennial plants are chosen.
- Pioneer species are included.
- All the plants shall not be edible.
- Species chosen will grow in the area without many problems.
- Root systems must have a binding effect on the soil.
- The final product should not cause an ecological imbalance in the area.

Seed distributors can give valuable advice as to the mixtures and amount of seed necessary to seed a certain area. Re-seeding, as well as fencing in of badly damaged areas, will always be at the discretion of the Environmental Control Officer, unless specifically requested by a Landowner.

- Management objective
  - Minimise damage to topsoil and environment at tower positions
  - Successful rehabilitation of all damaged areas
  - Prevention of erosion

- Measurable targets
  - No loss of topsoil due to construction activities

- All disturbed areas successfully rehabilitated within three months of completion of the contract
- No visible erosion scars three months after completion of the contract

5.20.2. Substation

All damaged areas shall be rehabilitated upon completion of the contract in accordance with design specifications. In accordance with the Conservation of Agricultural Resources Act, No 43 of 1983, slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced. Extra seed shall be sown on disturbed areas as directed by the ECO (see below for specifications). Other methods of rehabilitating disturbed sites may also be used at the discretion of the PM to comply with the conditions of the ROD and EMP, e.g. stone pitching, logging, etc. Contour banks shall be spaced according to the slopes. The type of soil shall also be taken into consideration.

A mixture of grass seed can be used provided the mixture is carefully selected to ensure the following:

- Annual and perennial grasses are chosen.
- Pioneer species are included.
- All the grasses shall not be edible.
- Species chosen will grow in the area under natural conditions.
- Root systems must have a binding effect on the soil.
- The final product should not cause an ecological imbalance in the area.

Seed distributors can also give valuable advice as to the mixtures and amount of seed necessary to seed a certain area. Re-seeding will always be at the discretion of the PM, unless specifically requested by a Landowner / Regional staff.

- Management objective
  - Minimise damage to topsoil and environment
  - Successful rehabilitation of all damaged areas
  - Prevention of erosion

- Measurable targets
  - No loss of topsoil due to construction activities
  - All disturbed areas successfully rehabilitated within one year of completion of the contract
  - No visible erosion scars one year after completion of the contract

5.20.3. General

The Contractor shall:

- Ensure that all disturbed areas are stabilised as soon as possible after disturbance. Particular attention must be paid to slopes greater than 20° (1:5) and other areas prone to erosion which should be appropriately vegetated. Rehabilitated areas that are susceptible to erosion due to their position in the landscape should be adequately protected by soil conservation measures.
- Ensure that rehabilitation is undertaken as soon as possible after completion of construction activities in any one area of the site.
- Ensure that all construction access roads are closed and the area rehabilitated upon completion of the construction works, unless otherwise specified by the Clerk of Works and agreed with the landowner.
- Remove from the site all construction equipment, surplus material, waste and temporary structures and works of every kind before the final hand-over. After completion of construction, the site should be properly cleaned of any construction waste, litter etc. and adequately rehabilitated/re-vegetated.
- Rehabilitate any environmental damage caused by construction activities before the final hand-over.
- Removal of all excavated material (rocks, excess soil, etc.) and construction rubble after construction is completed.
- Re-vegetated areas should be monitored by the Environmental Control Officer until the vegetation is stabilised. This monitoring must occur at three-monthly intervals for the first twelve months, and once a year thereafter, and may only halt once the vegetation has been stabilised
- Exotic weeds and invaders that are likely to establish on the rehabilitated areas are to be controlled to allow grasses to adequately establish.
- Damage to rehabilitated areas should be repaired promptly.
- The erosion risk will be reduced significantly during the dry season (i.e. winter). Therefore, depending on the construction schedule, excavation activities should aim to be focussed during winter.

The rehabilitation schedule and procedure to be adhered to is as follows:

- Replace the soil after the pole has been planted and ensure that the soil is compacted and levelled around the pole.
- Ensure that all construction material and rubble has been removed from site.

5.21. Winch- and Tensioner Stations

The siting of winch and tensioner stations shall be done in conjunction with the landowner and ecologist/botanist and archaeologist that participated in the compilation of the EMP where necessary.

Specifications require the protection of Eskom supplied material on site, especially conductor drums. This normally means that a firebreak is bladed around a drum station in the veld. These areas are left to rehabilitate on their own which could be disastrous.

Once the stringing of conductor has been completed in a certain area, the winch- and tensioner stations shall be rehabilitated where necessary. If the area was badly damaged, re-seeding shall be done and fencing in of the area shall be considered and carried out. For seeding the same provisions as in 5.20 shall apply.

Fencing in of the storage areas for drums on site is also proposed, as this will keep out animals and prevent injury. Should the Contractor want to leave guards on site, this should be discussed and negotiated with the Landowner. Proper facilities must be provided to ensure sanitation standards are met. Mobile chemical toilets shall be installed at such sites where a large number of the workforce is concentrated.

- Management objective
  - Minimise damage to vegetation
  - Minimise damage to topsoil
  - Successful rehabilitation of barren areas

- Measurable targets
  - No damage to vegetation outside the servitude
  - No loss of topsoil
  - No visible erosion three months after completion of the contract
  - All disturbed areas successfully rehabilitated three months after completion of the contract

5.22. Material Storage Areas

Specifications require the protection of Eskom supplied material on site, especially conductor drums. This normally requires that a firebreak is created around a material storage area. These areas are left to rehabilitate on their own which could be disastrous. Once construction has been completed on site and all excess material has been removed, the storage area shall be rehabilitated. If the area was badly damaged, re-seeding shall be done and fencing in of the area shall be considered if livestock will subsequently have access to such an area.

- Management objectives
  - Minimise disturbance of topsoil
  - Successful rehabilitation of disturbed areas

- Measurable targets
  - No remaining disturbance to vegetation outside the substation area
  - No loss of topsoil
  - All disturbed areas successfully rehabilitated one year after completion of the contract

5.23. Batching Plants

The siting of batching plants shall be done in conjunction with the landowner and ecologist/botanist and archaeologist that participated in the compilation of the EMP where required.

Refer to TRMSCAAC1 REV 3 section 4.8 for specifications regarding batching plants. The batching plant area shall be operated in such a way as to prevent contaminated water to run off the site and polluting nearby streams or water bodies. To this effect diversion berms can be installed to direct all wastewater to a catchment area.

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

- Management objective
  - To ensure all agreements with Landowners are adhered to
  - Prevention of complaints from Landowners
  - Successful rehabilitation of disturbed areas

- Measurable targets
  - No complaints from Landowners
  - All disturbed areas successfully rehabilitated three months after completion of the contract

5.24. Stringing Operations

The necessary scaffolding / protection measures must be installed to prevent damage to structures supporting (Refer TRMSCAAC1 REV 3 section 8.2.1.). All structures supplying services such as telephone and smaller power lines, as well as main roads, shall be safeguarded by measures to prevent disruption of services (see Section 5.27.4). All fences shall be protected against damage during stringing operations. Use of “rugby” posts to protect roads and telephone lines are sufficient.

- Management objective
  - Prevent damage to expensive structures
  - Prevent disruption of services

- Measurable targets
  - No claims emanating from damage to supporting structures
  - No complaints or claims arising from disruption of services

5.25. Transport of Equipment

All equipment moved onto site or off site during a project is subject to the legal requirements as well as Eskom specifications for the transport of such equipment. Oil filled equipment such as CT's, VT's and capacitor cans have specific safety requirements regarding their handling, transport and storage. The Contractor shall meet these safety requirements under all circumstances. All equipment transported shall be clearly labelled as to their potential hazards according to specifications. All the required safety labelling on the containers and trucks used shall be in place.

The Contractor shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken in the event of an accident and shall supply a method statement to that effect.

- Management objectives
  - Safe handling and transport of equipment
  - Safe handling and transport of hazardous substances
  - Minimise environmental pollution and damage

- Measurable targets
  - All equipment delivered to site in tact
  - No spillage of hazardous substances
  - No litigation due to environmental pollution

5.26. Social Issues

5.26.1. Sanitation

The Contractor shall install mobile chemical toilets on site (TRMSCAAC1 REV 3). Staff shall be sensitised to the fact that they should use these toilets at all times. No use of the veld shall be allowed, as this always create problems with the landowners and lead to claims for problems with stock diseases. Toilet paper is also a source of littering in the veld, and the Contractor shall be forced to clean up any litter.

- Management objective
  - Ensure that proper sanitation is achieved

- Measurable target
  - No complaints received from Landowners regarding sanitation

5.26.2. Interaction with Landowners and Interested &Affected Parties (I&APs)

The successful completion of the project depends a lot on the good relations with the Landowner and I&AP. It is therefore required that the Contractor will supply one person

to be the liaison officer (CECO) for the entire contract, and that this person shall be available to investigate all problems arising on the work sites concerning the Landowners and I&APs (TRMSCAAC1 REV 3)

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

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

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

- Management objective
  - Maintain good relations with Landowners and I&APs

- Measurable targets
  - No delays in the project due to Landowner / I&AP interference
  - Landowner / I&AP signs final release form

5.26.3. Littering Control

Littering by the employees of the Contractor shall not be allowed (TRMSCAAC1 REV 3 section 4.1.2 and Environment Conservation Act, No 73 of 1989). The Environmental Control Officer shall monitor the neatness of the work sites as well as the campsite. (Refer section 5.11 regarding rubble and refuse disposal). The Contractor shall collect all litter and dispose thereof in a suitable manner.

- Management objective
  - Neat workplace and site

- Measurable targets
  - No complaints from Landowners

5.26.4. Dust Control

Fugitive dust can be defined as natural and/or human-associated dust which becomes airborne due to the forces of wind or human activity. The control of fugitive dust is one of the most sensitive issues at construction sites. Potential sources of fugitive dust emissions during the construction phase include:

- Vehicle entrained dust from access roads and the construction site.
- Wind erosion from open areas and stockpiled imported and construction materials.

Given the nature of the study area, it should be taken into consideration that watering of construction roads may result in erosion. Selection of an appropriate dust suppression programme must, therefore, be made taking into consideration the nature of the study area and vehicle movements. It may be appropriate not to implement dust suppression mitigation on construction roads.

The Contractor shall:

- Ensure the implementation of effective and regular control techniques for fugitive dust sources within the Contractors area of responsibility. As appropriate, mitigation measures will include:
  - water spray of construction roads and work areas where appropriate, and where the risk of erosion is not significant (water for dust suppression shall only be taken from an approved source to be agreed to by the Clerk of Works or the Environmental Control Officer and the landowner);
  - adherence to speed limits for all vehicles;
  - stabilisation of disturbed areas as soon as possible after disturbance, through the introduction of vegetation or the use of stone-covering (e.g. at the substation site); and
  - limiting the extent of the area of exposed ground susceptible to dust emissions at any single point in time.

Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.

- Management objectives
  - Site works does not cause a nuisance to other people in the area

- Measurable targets
  - No formal complaints or claims arising due to dust pollution

5.26.5. Aesthetics

The site shall be kept visually and aesthetically pleasing, especially in and around the Contractor camp. The ECO shall regularly inspect the site to ensure that it is neat and clean. Where required the campsite shall be screened by the Contractor to ensure that there is no unacceptable visual intrusion in the area of the site. Screening can be done by use of shadecloth or corrugated fencing.

- Management objectives
  - Aesthetically pleasing works area, campsite and storage areas

- Measurable targets
  - No complaints from affected parties on or around the site

5.26.6. Access Control to Properties

Due to the current security situation Landowners are not comfortable when strangers come on to their properties. They will look for reasons to interfere with the construction process and may therefore cause delays in the process that can be very costly to Eskom and the Contractor.

The Landowners shall be kept abreast of all developments and shall be kept informed about the progress and phases of the contract. (Refer TRMPVACV2 rev1 – Procedure for Access to Farms in Appendix H)

No camping shall be allowed on any private property. If the Contractor wants to leave guards on site, it shall only be done with the written consent of the Landowners involved.

Damage to fencing, gates and other infrastructure may occur at any time. This will create problems with the Landowners and should be avoided as far as possible. All damage to be repaired immediately and to the satisfaction of the landowner.

5.27. Biological Issues

5.27.1 Fauna

The proposed Transmission lines are not likely to impact significantly on the birdlife in the vicinity and therefore no project specific mitigation measures are recommended.

Should any sites or nests be found during the construction process on surrounding Transmission lines within the vicinity of the new 400 kV Transmission lines, that were 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.

- Management objective
  - Minimise disruption of farming activities

- Minimise disturbance of animals
- Minimise interruption of breeding patterns of birds

- Measurable targets
  - No stock losses where construction is underway
  - No complaints from Landowners or Nature Conservation
  - No litigation concerning stock losses and animal deaths

5.27.2. Flora

The site for the development of two double circuit 400 kV Transmission power lines from the Atlantis OCGT site was indicated to have a low impact on the natural vegetation, mainly because of the high current levels of disturbance and transformation of the natural vegetation. However, the Atlantis site is situated within a vegetation type which is described by various botanical scientists as threatened, mainly due to human pressure (e.g. urban & industrial sprawl and agriculture). Any development is this area should, therefore, be approached with caution.

The following recommendations are put forward in light of this:

- The permanent loss of vegetation within the footprint area cannot be prevented. It can, however, be minimised:
  - Construction activities should be restricted to the minimum area needed.
  - Complete removal of all excavated material and construction rubble after construction is completed.
- Loss of rare, endangered and/or protected species: As indicated above no listed species were found at any of the areas demarcated for the tower structures. The final placement of the remaining tower structures will be within an area which is largely invaded by alien acacia species and the occurrence of red data species along these sections are highly unlikely. Final inspection of all tower sites should be done by a competent person within the ECO company prior construction of the tower structures - especially of the sites that were not indicated yet during the last site visit. Any species found should be relocated after consultation with the Dept. Nature Conservation.
- The site to be developed, along with the access routes and associated structures and transmission corridor should be marked temporarily (hazard tape). The indigenous plants within these areas should be removed to an established nursery (or one set out on the site) for use in the rehabilitation of disturbed areas after construction. A plant search and rescue operation can be done with the help of the local botanical society, universities and the Dept. Nature Conservation.
- An alien control and monitoring program must be developed starting during the construction phase and to be carried over into the operational phase. This has to be done specifically within the power line servitude.

- Disturbance of natural vegetation along the access routes and around the site etc. through trampling, compaction by motor vehicles etc. This is seen as a short-term impact that can be minimised:
  - Optimal use should be made of existing access roads.
  - After completion of construction, all access roads that will not be used for future maintenance of the station and the transmission servitude should be rehabilitated and re-vegetated if necessary to blend in with the surrounding vegetation.
  - Areas on construction sites that were visibly compacted by construction activities should be ripped to allow re-establishment of natural vegetation.
- Access roads as well as the OCGT plant should not disturb the natural drainage patterns. Full use should be made of the existing storm water system in the design of the OCGT
- Pollution of the surface and or ground water with petrol, diesel, oil, cement, paint, litter etc., secondarily affecting the vegetation of the receiving environment.
  - Construction activities should be limited to the Power station site and servitude areas.
  - Movement by construction personnel outside of the demarcated development areas should be strictly prohibited.
  - Adequate numbers and placement of portable chemical toilet facilities at construction sites is crucial to prevent unnecessary pollution of the surrounding vegetation. A ratio of one for fifteen personnel is proposed.
  - Littering, specifically of the natural areas, should be prevented. Adequate containers for litter removal should be supplied on site. These containers should be emptied on a regular basis and the contents removed to an appropriate and licensed waste disposal site.
  - After completion of construction, the site should be properly cleaned of any construction waste, litter etc. and properly rehabilitated/re-vegetated.
- Risk of fire: The risk of accidental fires to occur during the construction phase are considered to be high, especially during the dry summer months.
  - Accidental fires should be prevented through proper sensitisation of the contractors and their workers towards the associated risks, dangers and damage of property.
  - The use of open fires for cooking of food etc. by construction personnel should be strictly prohibited. Enclosed areas for food preparation must be provided.
  - Use of branches of indigenous trees and shrubs for fire making purposes must be strictly prohibited.

- Management objective
  - Minimal disturbance to vegetation where such vegetation does not interfere with construction and operation of the line
  - Prevention of litigation concerning removal of vegetation

- Measurable targets
  - No litigation due to removal of vegetation without the necessary permits

5.27.3. Herbicide Use

Herbicide use shall only be allowed with the approval of Eskom. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used.

The use of herbicides shall be in compliance with the terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No 36 of 1947). In terms of this Act, a registered pest control operator shall apply herbicides, or shall supervise the application of herbicides.

Therefore, the Contractor shall:

- Ensure that a registered pest control operator applies or supervises the application of all herbicides.
- Ensure that all Eskom policies on the use and application of herbicides shall be adhered to.
- Ensure that all herbicides are stored in a well-ventilated demarcated storage area.
- Ensure that a register of all contents of the storage area is kept and updated on a regular basis.
- Ensure that a daily register of all relevant details of herbicide usage is kept, and that such a register is maintained by the relevant Eskom custodian.

- Management objective
  - Control over the use of herbicides

- Measurable targets
  - No signs of vegetation dying due to leaching of herbicides one year after completion of the bush clearing
  - No Landowner complaints and litigation

5.28. Cultural Issues

5.28.1. Archaeology

Artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from the South African Heritage Resources Association (SAHRA) should the proposed line affect any world heritage sites or if any sites are to be destroyed or altered. No dolomite, breccia or stomatolites may be removed or disturbed without the required permits from SAHRA.

Should any archaeological sites be uncovered during construction, their existence shall be reported to Eskom immediately, Mamokete Mafumo to be informed at 011 800 2621. An archaeologist will then take the necessary action so that construction can continue.

- Management objective
  - Protection of archaeological sites and land considered to be of cultural value
  - Protection of known sites against vandalism, destruction and theft
  - The preservation and appropriate management of new archaeological finds should these be discovered during construction

- Measurable targets
  - No destruction of or damage to known archaeological sites
  - Management of existing sites and new discoveries in accordance with the recommendations of the Archaeologist

5.28.2. Infrastructure

If damaged infrastructure is not repaired to the expectations of the Landowners, they may refuse to sign the release forms and even engage in litigation. Outstanding claims may also result in release forms not being signed by the Landowners.

No telephone lines or fences shall be dropped during the stringing operations. All crossings shall be with at least rugby posts to protect the telephone lines and temporary measures to protect fences. Where pipe lines are found along the route, the depth of the pipes under the surface shall be determined to ensure that proper protection is afforded to such structures. All pipelines shall be clearly marked and protected. Any damage to pipe lines shall be repaired immediately.

The use of private roads for construction purposes always leads to damage due to heavy equipment and frequent use. It is foreseen that the Contractor will receive many complaints in this regard, especially during the rainy season.
All existing private access roads used for construction purposes, shall be maintained at all times to ensure that the local people have free access to and from their properties. Speed limits shall be enforced in such areas and all drivers shall be sensitised to this effect. Upon completion of the project all roads shall be repaired to their original state.

- Management objective
  - The control of temporary or permanent damage to plant and installations
  - Control of interference with the normal operation of plant and installations
  - Securing of the safe use of infrastructure, plant and installations

- Measurable targets
  - 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 plant, installations and crops

6. REQUIREMENTS DURING CONSTRUCTION PERIOD

- Proper and continuous liaison between Eskom, the Contractor and Landowners to ensure everyone is informed at all times.
- A physical access plan along the servitude shall be compiled and the Contractor shall adhere to this plan at all times. Proper planning when the physical access plan is drawn up by the Environmental Control Officer in conjunction with the Contractor shall be necessary to ensure access to all tower sites.
- The Landowners shall be informed of the starting date of construction as well as the phases in which the construction shall take place.
- The Contractor must adhere to all conditions of contract including the Environmental Management Programme and landowner special conditions.
- Proper planning of the construction process to allow for disruptions due to rain and very wet conditions.
- All servitude gates on a section of the line route shall be completely installed before any construction activities are undertaken.
- Where existing private roads are in a bad state of repair, such roads' condition shall be documented before they are used for construction purposes. If necessary some repairs should be done to prevent damage to equipment and plant.
- All manmade structures shall be protected against damage at all times and any damage shall be rectified immediately.
- Rehabilitation of the servitude roads shall be done properly to ensure all Landowners sign the release forms. The Contractor shall ensure that all damaged areas are rehabilitated to the satisfaction of Eskom and each and every property owner and that outstanding claims are settled.
- Proper site management and regular monitoring of site works.
- Proper documentation and record keeping of all complaints and actions taken.
- Regular site inspections and good control over the construction process throughout the construction period.
- Appointment of an Environmental Control Officer on behalf of the Contractor to implement this EMP as well as deal with all Landowner related matters.
- Environmental Audits to be carried out during and upon completion of construction (at least two for the project).

The Contractor shall not be released from site until all Landowners have signed off the release documentation to the satisfaction of the Eskom Environmental Control Officer.

7. PHYSICAL ACCESS PLAN

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

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

8. SITE DOCUMENTATION / MONITORING / REPORTING

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

Two-weekly reports shall be forwarded to the appointed Transmission Services and TAP Environmental Advisor with all information relating to environmental matters. The following Key Performance Indicators must be reported on a two-weekly basis:

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

The following documentation shall be kept on site:

- Access negotiations and physical access plan.
- Complaints register.
- Site daily dairy.
- Records of all remediation / rehabilitation activities.
- Copies of two-weekly reports to the TAP and Transmission Services Environmental Advisor at Megawatt Park, Johannesburg.
- Copy of the Environmental Management Programme (EMP) file.

8.1. Compliance with the Environmental Management Plan Specifications

- The EMP shall be available on-site at all times.
- All persons employed by the Contractor or his sub-contractors shall abide by the requirements of the EMP.
- Any members of the construction workforce found to be in breach of any of the specifications contained within the EMP may be ordered by the Project Manager or Clerk of Works to leave the site. The order may be given orally or in writing. Confirmation of an oral order will be provided as soon as practically possible, but the absence of a written order shall not be cause for an offender to remain on site. No extension of time will be granted for any delay or disadvantage to the Contractor brought about by an offender ordered to leave the site.

- The Contractor shall not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMP.
- Should the Contractor be in breach of any of the specifications contained in the EMP, the Project Manager shall, in writing, instruct the Contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work shall be suspended should non-compliance continue.
- Should non-compliance continue, further written notification shall be forwarded to the Contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work shall be suspended as specified previously.
- The Contractor shall be responsible and shall bear the cost of any delays, corrective or remedial actions required as a result of non-compliance with the specifications and clauses of the EMP.

8.2. Environmental Register

The Contractor shall:

- Report incidents involving Contractor employees and/or the public that could potentially cause negative sentiment and perception towards the project and/or Eskom.
- Report environmental complaints and correspondence received from the public to the Project Manager or the Environmental Control Officer.
- Record and report incidents that cause harm or may cause harm to the environment to the Environmental Control Officer.
- Record all hazardous materials used on site.
- Maintain a record of all Hazardous Waste Disposal Manifests detailing the nature of the hazardous waste disposed of, the hazardous waste classification and the location of the site to which such waste was sent.

The above records will form an integral part of the Contractors' Records. These records will be kept with the EMP, and will be made available for scrutiny if so requested by the Project Manager or his delegate and the Environmental Control Officer.

The Environmental Control Officer shall put in place an Environmental Register to document:

- All environmental complaints and correspondence received from the public, Eskom or the construction workforce.
- Incidents of non-compliance with the EMP.
- Any other environmental incidents related to the construction phase of the project.

The Environmental Control Officer shall ensure that the following information is recorded for all complaints/incidents:

- Nature of complaint/incident.
- Causes of complaint/incident.
- Party/parties responsible for causing complaint/incident.
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident.
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident.
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions.
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented.
- Copies of all correspondence received regarding complaints/incidents.

9. REFERENCES

Conservation of Agricultural Resources Act, Act 43 of 1983 and amendments.
Corporate directive for the management of PCB, ESKADAAO3 REV 1.
Environmental Impact Report of the Project.
Eskom Guidelines for Herbicide Use, TRR/S91/032.
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APPENDIX A
RECORD OF DECISION

APPENDIX B
RELEVANT ENVIRONMENTAL LEGISLATION

APPENDIX C
ESKOMS TRMSCAAC1 REV 3

APPENDIX D:
ESKOM TRANSMISSION'S ENVIRONMENTAL POLICY
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APPENDIX E:
ESKOM'S POLICY ON BUSHCLEARING

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VEGETATION MANAGEMENT GUIDELINE

APPENDIX G:
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APPENDIX H:
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