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DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

**PROPOSED RUSTENBURG STRENGTHENING PHASE 2 (MARANG B)
WITHIN RUSTENBURG LOCAL MUNICIPALITY OF BOJANALA DISTRICT
MUNICIPALITY, NORTH WEST PROVINCE**

DEA REF: 14/12/16/3/3/2/611

PREPARED BY

DYNAMIC INTEGRATED GEO-ENVIRONMENTAL SERVICES

FOR



ESKOM HOLDING SOC LIMITED

ESKOM MEGAWATT PARK

1 MAXWELL DRIVE

SUNNINGHILL

MARCH 2016

EXECUTIVE SUMMARY

Eskom Holdings SOC Ltd commissioned Dynamic Integrated Geo-Environmental Services (DIGES) to carry out an Environmental Impact Assessment for the proposed construction of 400/132kV substation and ±2km 400kV loop in loop out power line from the Marang-Midas power line. Rustenburg's platinum mining, smelting operations and commercial operations is supplied by four Main Transmission Substations (MTS) with Marang 400/88kV MTS being one of them. The load profile undertaken by Eskom Holdings SOC Ltd at the substation indicated that the recorded peak load was 776MVA in years 2010/11 and 694MVA in years 2011/12. As a result, the Marang 400/88kV will exceed the 400/88kV firm capacity limit by 2015/16. The MTS has space limitations in terms of increasing its installed capacity beyond the fourth 315MVA transformer; hence Marang re-enforcement will require a new site or an extension outside the existing terrace. The solution is to extend the existing Marang substation.

This activity was assessed with the option for constructing a new substation and loop in and out power lines. The alternative recommended, substation extension, is listed in Government Notice, R544 Activity No. 23(ii).

This document therefore discusses the impacts that are expected during the construction phase, operational phase and the mitigation measures that have been recommended to minimize the impacts. This document also identifies corrective actions if monitoring indicates that the performance requirements have not been met and notifies the responsible parties to undertake the actions required. Integrated Environmental Management (IEM) principles influenced the development of these measures, which are aimed at achieving broadly acceptable standards at minimum costs. These measures, procedures and monitoring guidelines are designed to ensure that the impacts anticipated as a result of the proposed development are limited to the acceptable significance predicted in this study.

Should these recommended measures and corrective actions be adopted in the construction, operation/maintenance and decommissioning phases of the proposed activity, DIGES finds that the predicted impacts of the proposed activities are within acceptable limits. It should be noted however, that environmental management is dynamic and as such the EMPr must be flexible in order to accommodate changing circumstances and requirements. Ongoing environmental monitoring and maintenance of the Marang MTS should be carried out throughout its life cycle, and such should be conducted by Eskom and a dedicated Environmental Practitioner, to identify and address new issues as they arise, and to update or amend the management plan accordingly.

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ACRONYMS AND ABBREVIATIONS

<i>CARA</i>	<i>Conservation of Agricultural Resources Act</i>
<i>CLO</i>	<i>Community Liaison Officer</i>
<i>DEA</i>	<i>Department of Environmental Affairs</i>
<i>DIGES</i>	<i>Dynamic Integrated Geo-Environmental Services</i>
<i>DWA</i>	<i>Department of Water Affairs</i>
<i>DME</i>	<i>Department of Minerals and Energy</i>
<i>EA</i>	<i>Environmental Authorization</i>
<i>EAP</i>	<i>Environmental Assessment Practitioner</i>
<i>ECA</i>	<i>Environment Conservation Act</i>
<i>ECO</i>	<i>Environmental Compliance Officer</i>
<i>EIA</i>	<i>Environmental Impact Assessment</i>
<i>EMPR</i>	<i>Environmental Management Programme</i>
<i>HA</i>	<i>Hectares</i>
<i>HSO</i>	<i>Health and Safety Officer</i>
<i>IAP</i>	<i>Interested and Affected Parties</i>
<i>IEM</i>	<i>Integrated Environmental Management</i>
<i>kV</i>	<i>kilo Volts</i>
<i>MTS</i>	<i>Main Transmission Substation</i>
<i>NBA</i>	<i>National Biodiversity Assessment</i>
<i>NEMA</i>	<i>National Environmental Management Act</i>
<i>NHRA</i>	<i>National Heritage Resources Act</i>
<i>ROW</i>	<i>Right Of Way</i>
<i>SAHRA</i>	<i>South African Heritage and Resources Agency</i>
<i>SANS</i>	<i>South African National Standards</i>

DEFINITIONS

1. **Affected environment:** *Those parts of the socio-economic and biophysical environment impacted on by the development;*
2. **Alien Vegetation:** *alien vegetation is defined as undesirable plant growth which shall include, but not be limited to; all declared category 1, 2 and 3 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable;*
3. **Alternatives:** *A possible course of action, in place of another, which would meet the same purpose and need (of proposal). Alternatives can refer to any of the following but are not limited hereto: alternative sites for development, alternative layouts or alternative designs, alternative processes and materials. In Integrated Environmental Management the so-called "no action" alternative may also require investigation in certain circumstances;*
4. **Assessment:** *The process of collecting, organizing, analyzing, interpreting and communicating data that is relevant to some decision;*
5. **Construction Activity:** *a construction activity is any action taken by the contractor, his subcontractors, suppliers or personnel during the construction process.*
6. **Corrective Action:** *This entails the process of reacting to a problem or non conformity to the mitigation measures recommended. The process includes:*
 - *Reviewing and defining the problem or nonconformity*
 - *Finding the cause of the problem*
 - *Developing an action plan to correct the problem and prevent a recurrence*
 - *Implementing the plan*
 - *Evaluating the effectiveness of the correction.*
7. **Development:** *The act of altering or modifying resources in order to obtain potential benefits;*
8. **Environment:** *The external circumstances, conditions and objects that affect the existence and development of individual, organism or group. These circumstances include biophysical, social, economic, historical, cultural and political aspects;*
9. **Environment Authorization:** *is a written statement from the Department of Environmental Affairs that records its approval of a planned undertaking to extend the Marang MTS and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract;*
10. **Environmental impact:** *The degree of change in environmental components resulting from the effects of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organization's activities or may be indirectly caused by them;*

11. **Environmental Impact Assessment:** *A process of examining the environmental effects of a proposed development;*
12. **Environmental issue:** *A concern felt by one or more parties about some existing, potential or perceived environmental impact;*
13. **Environmentally Sensitive Area:** *An area designated in regional or local land use plans, or by a local, regional, provincial or government body as being sensitive to disturbance or identified by an applicant as being sensitive for some reason;*
14. **Erosion:** *The process by which material, such as rock or soil, is worn away or removed by wind or water;*
15. **Evaluation:** *The process of weighing information, the act of making value judgments or ascribing values to data in order to reach a decision;*
16. **Integrated environmental management (IEM):** *Is a process of integrating environmental, Socio-economic and cultural factors in decision making to promote sustainable development. Principles underlying IEM provide for a democratic, participatory, holistic, sustainable, equitable and accountable approach;*
17. **Mitigation:** *the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means;*
18. **Monitoring Programme:** *The program for observing the potential environmental effects of a project, resolving specific outstanding environmental issues, and determining the action required based on the result of these activities;*
19. **Power line:** *An overhead line erected for the conducting of electricity;*
20. **Right of Way (ROW):** *The strip of land acquired for which ESKOM has obtained the rights for construction and operation of the distribution line;*
21. **Stakeholder:** *A stakeholder is any group or individual that may be potentially affected by a proposed project. Stakeholders typically include elected officials, government and non-government agencies, environmental and other special interest groups, developers, educators, landowners and members of the public;*
22. **Study Area:** *The area within the spatial boundaries of the scope of the environmental and socio-economic effects assessment.*

1. INTRODUCTION

An Environmental Management Programme (EMPr) is a plan that seeks to achieve a required end state and describes how activities that have or could have an adverse impact on the environment, will be mitigated, controlled and monitored. The proposed extension of the existing Marang substation is expected to have significant impacts on the environment. This document (EMPr) is prepared as a guideline on how the intended development would affect the environment and the way the expected impacts should be mitigated during the construction and operation phase of the project.

In order to achieve this, a number of environmental specifications and recommendations will be made. These are aimed at ensuring that the contractor maintains adequate control over the project in order to:

- Minimize the extent of the impact during extension of the substation;*
- Ensure appropriate restoration of areas affected by construction, and*
- Prevent long-term environmental degradation.*

This draft document will also ensure that all works undertaken will meet appropriate environmental commitments as outlined in the Environmental Impact Assessment as well as the legislative requirements. This EMPr will identify corrective actions if monitoring indicates that the performance requirements have not been met and notifies the responsible parties to undertake the actions required. The Contractor must be aware of the environmental obligations that are stipulated in this document, and declare him/herself to be conversant with all the relevant and applicable environmental legislation. The contractor should be aware that the Environmental Control Officer (ECO) would monitor the implementation of the procedures.

1.1 OBJECTIVES OF THE EMPr

This EMPr has the following goals:

- Identifying construction activities that may have a detrimental impact on the environment.*
- Detailing the mitigation measures that will need to be taken, and the procedures for their implementation.*
- Establishing management responsibilities and reporting requirements to demonstrate compliance with this EMPr.*

It also serves to highlight specific requirements that will be monitored during the development and should the environmental impacts not have been satisfactory prevented or mitigated, corrective action will have to be taken. The document should, therefore, be seen as a guideline that will assist in

minimizing the potential environmental impact of activities to be undertaken in the implementation of the proposed project.

1.2 ASSUMPTIONS

The EMPr is based on the assumptions described below.

- The main works to be carried out will be limited to activities typically defined as extension of the existing Marang substation;
- The works will be carried out within the Right Of Way (ROW) and will not involve relocation;
- The Project-related impacts are site specific; no significant impacts are expected; and appropriate mitigation measures can be developed and implemented by the contractors.

1.3 EMPr TRAINING AND AWARENESS

- *The contractor shall arrange for the site induction on the Environmental Awareness issues before commencement of the project;*
- *The contractor shall ensure that adequate environmental awareness training of all the personnel working on the site familiarise with the contents of the environmental site control measures which are outlined in this EMPr.*
- *The contractor shall also make this training and awareness programme be conveyed to the personnel on site to the satisfaction of the Environmental Control Officer (ECO), either in written format or verbal, in the employees' language of choice.*
- *Records of all, environmental training sessions, including names, dates and the information presented should be kept by the contractor.*

The environmental training should, as a minimum, include the following:

- *The importance of conformance with all environmental policies;*
- *The environmental impacts, actual or potential, of their work activities;*
- *The environmental benefits of improved personal performance;*
- *Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of Eskom's environmental management systems, including emergency preparedness and response requirements;*
- *The potential consequences of departure from specified operating procedures;*
- *The mitigation measures required to be implemented when carrying out their work activities.*

In the case of permanent staff, the contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the contractor shall inform the engineer when and how he/she intends concluding his environmental training obligations.

1.4 ADMINISTRATION MANAGEMENT

This EMPr should be used as working document and is recommended to be available on the construction site. The stipulations and provisions of this report should be conveyed to and familiarized by the contractor's senior personnel and workers responsible for construction. The mitigation section should be issued as a stand-alone document to all parties involved with the planning, implementation and operation of the proposed project.

1.5 RESPONSIBILITIES

The proposed activities require the commitment of the people assigned responsibilities to undertake their duties so as to avoid negative impacts on the environment.

1.5.1 Contractor/ Site Manager

The Contractor is responsible for:

- *Complying with this EMPr; and*
- *Obtaining all licences and approvals from Eskom.*

The contractor will be held responsible for all the rehabilitation of all the areas disturbed during the extension of the substation.

1.5.2 Site Engineer

- *The site engineer must constantly monitor the progress of the contractor so as to meet the time frame of the project to completion.*
- *The Engineer should be responsible for keeping a register of complaints in the site office and resolving the complaints. She/he will need to keep a record of on-site incidents and accidents and how these were dealt with.*

1.5.3 Environmental Control Officer

- *The Environmental Control Officer will monitor and review the on-site environmental management and implementation of the Construction EMPr by the Contractor.*
- *The ECO will be monitoring and verifying adherence to the EMPr and the Environmental Authorisation (EA) as well as monitoring and verifying that environmental impacts are kept to a minimum. In addition to this, the ECO will assist the Contractor in finding environmentally responsible solutions to problems and auditing the implementation of the EMPr and compliance with the EA on a monthly basis. The ECO shall regularly conduct site inspections of the site with regards to compliance with the EMPr.*

1.6 REPORTING REQUIREMENTS

A dedicated file will be established by the Contractor for the development to contain all documentation pertaining to environmental management of the works.

During construction, the ECO will undertake ongoing inspections of the works to identify non-compliance with the provisions of the EMPr. The ECO will immediately report any non-compliance to Eskom's Environmental Advisor.

1.7 COMPLAINTS PROCEDURES

A complaint and environmental incident registers will be kept, including the actions they take in response to these complaints. All complaints must be reported to the relevant departments.

A register of public complaints will be kept by the engineer. This register will be a separate file containing the following information where it has been supplied by the complaints:

- *Name, address and contact telephone number;*
- *Nature and the description of the complaints;*
- *Date and time of the complaints; and*
- *How the complaints was resolved or followed up.*

1.8 EMPLOYMENT

Without compromising construction and operation activities and schedules, local labour should also be employed. Those successful in obtaining employment should be provided with the appropriate skills development and training.

1.8.1 Local Labour Recruitment and Employment strategy

The strategy to be adopted should be in line with and guided by the objectives and policies of National Government. The objective of this project amongst others is to empower local communities, as historically disadvantaged individuals. For many years in South Africa, community development has been shadowed by anomalies, which remained unaddressed for a long time. These anomalies included amongst others, inadequate needs assessment, lack of consultation with the beneficiaries, inappropriate programmes and implementation technologies. The South African Government has rules and regulations that guide the implementation and management of similar projects. These guidelines manifest themselves in programmes such as the Community Based Public Works Programme, Working for Water Programme and many other Poverty Alleviation Programmes under the Social Development Department. The social dynamics of a community should be taken into consideration in the formulation of a facilitation strategy.

1.9 LEGISLATION

This EMP is a working document and hence will require updates in response to changes in legislation and the environment. It is the responsibility of Eskom, ECO and the contractor to implement these changes ensuring that it is continually updated. The legislation below should be referred to when making decisions and resolving complaints in respect of matters relating to this document. Below is the list of applicable legislation for the proposed development

i. National Heritage Resources Act 25 of 1999.

The act protects all structures and features older than 60 years (section 34), archaeological sites and material (section 35) and graves and burial grounds (section 36).

ii. National Environmental Management Act, 1998 (Act No. 107 of 1998)

The National Environmental Management Act aims to improve the quality of environmental decision-making by setting out principles for environmental management that apply to all government departments and organisations that may affect the environment. The IEM principles also aim to ensure that environmental impacts are considered before actions are taken or implemented and to ensure that there are adequate opportunities for public participation in decisions that may affect the environment. NEMA also creates a framework for facilitating the role of civil society in environmental governance.

The applicant is responsible for compliance with the provisions for Duty of Care and Remediation of Environmental Damage contained in Section 28 of the National Environmental Management Act (Act 107 of 1998).

iii. National Forest Act 84 of 1998

In terms of the Act, forest trees or protected tree species may not be cut, disturbed, damaged or destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold except under license granted by the Department of Water and Environmental Affairs.

iv. The National Environmental Management: Air Quality Act no 39 of 2004

The main objective of the Air Quality Act (NEMAQA) is the protection of the environment and human health, in a sustainable (economic, social and ecological) development framework, through reasonable measures of air pollution control.

v. The National Water Act, 1998 (Act 36 of 1998)

In terms of Chapter 3 section 12-20, water resources are to be protected, used, developed, conserved, managed and controlled.

vi. Occupational Health and Safety Act 85 of 1993

To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work.

vii. The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

The act focuses on soil conservation, control of the utilization and protection of wetlands, control and prevention of veldt fires, control of weeds and invader plants. The act as amended in March 2001 sets out the regulations regarding the control of weeds and invasive plants and provides a list of declared plants.

The following ESKOM standards/ guidelines shall also be used in conjunction with the EMPr:

- The safe use of pesticides and herbicides, ESKASAAL0;*
- Guidelines for weed eradication at Eskom substations using herbicides, TRR/S.92/034;*
- Oil spill clean-up and rehabilitation, ESKAGAAD7;*
- Erosion Guideline, TGL41-337; and*
- Vegetation Management Guidelines, TRMAGAAZ7.*

2. PROPOSED PROJECT DESCRIPTION

2.1 BACKGROUND

Rustenburg's platinum mining, smelting operations and commercial operations is supplied by four Main Transmission Substations (MTS) with Marang 400/88kV MTS being one of them. The load profile undertaken by Eskom Holdings SOC Ltd at the substation indicated that the recorded peak load was 776MVA in years 2010/11 and 694MVA in years 2011/12. As a result, the Marang 400/88kV will exceed the 400/88kV firm capacity limit by 2015/16. The MTS has space limitations in terms of increasing its installed capacity beyond the fourth 315MVA transformer; hence Marang re-enforcement will require a new site or an extension outside the existing terrace. The solution is to extend the existing Marang substation to allow for the provision for new 3x 500MVA 400/132kV transformers.

2.2 PROJECT DESCRIPTION

The proposed project entails the extension of the existing Marang substation to allow for the provision for new 3x 500MVA 400/132kV transformers.

The project is located on Portion 2 of Elandsheuvell 282 JQ and Klipgat 281JQ within Rustenburg Local Municipality which falls under Bojanala Platinum District Municipality of North West Province. The project area is approximately 14km north east of Rustenburg and is bordered by Boitekong in the west, Anglo Platinum mine in the south and Bospoort dam is approximately 2.5km north of the site. The sites are adjacent to the existing Marang 400/88kV substation and associated 400kV and 88kV power lines that feed in and out of the substation traverse across the area. The area can be accessed via D522 road.

2.3 TECHNICAL ASPECTS

The construction phase of the project is expected to take up to 24 months with a project lifespan of 40 years or more. Approximately 102 individuals will be employed on site and the procurement of local labor will be according to the labor laws and social development laws of South Africa. The main works for the extension of the substation include the following:

- Access Road Construction*

Where there is no existing Services Access available or where ground conditions prevent normal Services Access, temporary Services Access routes may have to be constructed. If temporary Services Access roads need to be installed then either a trackway system or temporary stoned Services Access roads are technically acceptable.

- Substation Construction*

The construction of a substation typically consists of, but is not limited to the following sequence of activities:

- a) *Cut and fill grading;*
- b) *Placement and compaction of structure fill to serve as a foundation for equipment;*
- c) *Grading to maintain drainage patterns;*
- d) *Oil spill containment facilities;*
- e) *Crushed rock surfaced yard, parking areas and roads;*
- f) *Fencing and gating;*
- g) *Landscaping with native plants where applicable;*
- h) *Installation of equipment and structure foundations;*
- i) *Installation of structures and equipment;*
- j) *Installation of bussing materials;*
- k) *Installation of control shelter; and*
- l) *Installation of control and relaying equipment and wiring.*

3. SITE ESTABLISHMENT

The location of the construction camp is selected by the contractor, ECO and site engineer who will take into account such aspects as access to the construction site, access to services, and access to materials. The contractor will enter into an agreement with a landowner for the establishment of the construction camp. The construction personnel will travel from the camp to the construction site each day.

3.1 EXPECTED IMPACTS

The following impacts are expected during the establishment of the site camp and associated infrastructure;

- i. Removal of indigenous, protected plant species or red data species;*
- ii. Destruction of existing infrastructure;*
- iii. Fire outbreaks causing infrastructure and vegetation destruction;*
- iv. Noise and air pollution as a result of vehicle movement;*
- v. Impact on the visual environment due to the erected site offices.*

3.2 MANAGEMENT OBJECTIVES

- i. Minimize unnecessary damage to vegetation;*
- ii. Minimize damage to natural features;*
- iii. Protect the public and ensure their safety from the works;*
- iv. Prevent pollution of the environment;*
- v. Keep the site clean, neat and natural looking as possible; and*
- vi. Ensure that on completion, the site is efficiently demobilised and rehabilitated to the public's and ECO's satisfaction.*

3.3 MITIGATION MEASURES

3.3.1 Establishment

- Before construction work commences, a survey of the site must be carried out, a photographic and written record should be kept;*
- The public or the affected people within the project area or who will be affected by the construction works must be notified of the intended work to be carried out including the duration of the proposed works;*
- Footpaths or roads that will be closed or obstructed must have signage and barriers;*
- Landowners where the power lines will be constructed must be notified; and*
- Site boundaries set out by the engineer must be respected.*

3.3.2 Site Layout

Before construction commences, the contractor shall submit a site layout plan to the

Site engineer for approval, including:

- *Site access (including entry and exit points);*
- *Office accommodation;*
- *Access and haulage routes;*
- *All material and equipment storage areas (including storage areas for hazardous substances such as fuel and chemicals);*
- *Areas where construction vehicles will be serviced; and*
- *The construction camp, office and storage areas for material and equipment must be fenced in to prevent impacts and human interference to spread further than the site.*

3.3.3 Access

- *Access for construction traffic will be required and maintained to all sites during the construction phase; and*
- *Where there is no existing access available or where ground conditions prevent normal access, temporary access routes may have to be constructed.*

3.3.4 Staging Areas

- *The staging and materials storage area should be installed before any structure is constructed on the site camp;*
- *Construction equipment and vehicles should be stored at the staging area;*
- *Gravel bag berms should be installed around the perimeter to designate the staging and materials storage areas;*
- *Non-hazardous material shall be stored in a separate covered storage facility; and*
- *It is discouraged to store hazardous material on site, should they be needed, the materials should be stored in labeled sealed containers.*

3.3.5 Removal of indigenous vegetation

- *Where areas are going to be disturbed through the destruction of vegetation, for example the establishment of the construction camp, the vegetation occurring in the area to be disturbed must be salvaged and kept in a controlled environment such as a nursery, for future re-planting in the disturbed areas as a measure of rehabilitation.*

3.3.6 Destruction of Existing Infrastructure

- *The construction team shall at all times exercise due care and diligence not to damage fences, roads, tracks, buildings, hedges and trees. All damage shall be made well at first opportunity, at the Contractor's cost depending on the type of damage and the responsible party for such damage.*

3.3.7 Fire outbreaks

- *Fire breaks must be constructed on the inside perimeter to prevent fires from spreading from the site as well as fires entering the site from adjacent land in accordance with the ESKOM Standard SCSASAAJ6: Rev 0, Distribution of Fire Risk Management; and*
- *A fire management plan must be identified, implemented and maintained, commencing prior to construction and maintained throughout the operational phase. The following additional measures must be included:*
 - ❑ *No fires may be made for the burning of vegetation and waste;*
 - ❑ *No open fires are to be made on site; cooking facilities must be provided;*
 - ❑ *No firewood may be collected;*
 - ❑ *Fire fighting equipment must be readily available on site during all times; and*
 - ❑ *Burning of waste material such as vegetation and old cleaning materials resulting from maintenance activities at the site is strictly prohibited.*

3.3.8 Noise and air pollution

- *To minimize air and noise pollution, construction team shall use only equipment in good condition, which shall be properly maintained; and*
- *Disturbance or disruption of the daily lives of local communities and their livelihood, including noise and dust pollution shall be minimized in as far as is practicable.*

3.3.9 Visual Impact

- *The Contractor shall ensure that the construction site is maintained in a neat and tidy condition at all times so as to maintain the natural scenic beauty of the border area.*

3.3.10 Site Clearance/Demobilisation

- *All damage done as a result of construction works should be rehabilitated to the satisfaction of the ECO. Reference should be made to the Re-vegetation and Rehabilitation Plan;*
- *Where soil is contaminated, the contaminated soil should be removed and disposed of at a hazardous landfill and the area cleaned up. Reference is made to the Spills Prevention Plan;*
- *All portable toilets should be removed on site; and*
- *Fences should be removed and poles filled up unless the landowner requests otherwise;*
- *Public roads and footpaths must be checked to ensure that they are in good condition and safe for public use; and*
- *Prior to leaving the site, all signage boards must be removed.*

3.4 PERFORMANCE MEASURES

- *Clean site;*
- *Photographic and written records of pre-construction site establishment; and*

- *A fire management plan is in place before construction.*

3.5 MONITORING

- *The ECO should inspect all storage areas weekly and after storms; and*
- *The site manager should inspect the site camp daily to ensure compliance by all site personnel.*

3.6 CORRECTIVE ACTIONS

- *The ECO should review and analyse the cause of the detected non-conformance and the corrective action must include details of the action proposed.*

4. TRAFFIC MANAGEMENT PLAN

This section aims to address hazards associated with construction vehicles and public vehicles, pedestrians and infrastructure and the processes undertaken to eliminate or reduce the risks associated with these interactions. Construction traffic movements may include deliveries of materials, supplies and equipment on site, haulage of earthwork materials and regular traffic movements by construction personnel.

The project is within Rustenburg Local Municipality and can be accessed via the D522 road.

4.1 MANAGEMENT OBJECTIVE

- i. To address traffic issues arising from the extension of Marang substation; and*
- ii. To reduce the number of accidents between construction vehicles and the public.*

4.2 MITIGATION MEASURES

4.2.1 Access

- *Once the camp site area has been identified, the contractor in consultation with the ECO, Health and Safety Officer and the site engineer will set routes:
 - *That all site deliveries will be directed along to gain access to site;*
 - *That all construction vehicles will use when leaving the site camp; and**
- *Where there is no existing access available or where ground conditions prevent normal access, temporary access routes may have to be constructed.*

4.2.2 Vehicles

- *Pre-operational safety checks must be conducted for vehicles and equipment operating on site;*
- *Employees and construction workers driving and operating vehicles must do so in a safe manner;*
- *Employees operating equipment/vehicles shall not use alcohol and other drugs when operating equipment;*
- *Vehicles must comply with all speed limits of 40km/h;*
- *Only personnel licensed and authorized to operate designated equipment must use the equipment;*
- *Designated routes must always be used when operating equipment;*
- *Traffic signs and directional markings must be adhered to at all times;*
- *Mounting/dismounting a moving vehicle is prohibited;*
- *Vehicles must always be parked in designated parking areas;*

- *Contractor must provide its employees with a vehicle that meets the appropriate safety standards; and*
- *Any safety related matters with regards to the operating vehicles must be reported immediately.*

4.2.3 Pedestrian Routes

- *Pedestrian routes should be wide enough to accommodate the number of people that are likely to use them at peak times;*
- *Pedestrian routes should be kept free of obstructions;*
- *Footpaths should be clearly and suitably signed; and*
- *Routes should be able to cross the main vehicle routes safely.*

4.3 PERFORMANCE MEASURES

- *The number of accidents recorded;*
- *Minimal disturbance of normal traffic flow; and*
- *A record of complaints received.*

4.4 MONITORING

- *The site manager and ECO will undertake general surveillance of access tracks and roads and surrounding areas for damage of access roads and impact on other road users;*
- *Routes and signage should be inspected daily to allow safe access; and*
- *Weekly reports to the Healthy and Safety Officer, including the number of the accidents, fatalities and the causes of the accidents.*

4.5 CORRECTIVE ACTION

- *Repair damage to access tracks and roads in consultation with the relevant authority, North West Department of Roads and Transport and Rustenburg Local Municipality.*

5. ECOLOGICAL MANAGEMENT

The ecological/biodiversity assessments undertaken by Dr. Wynand Vlok and avi-fauna assessment undertaken by Chris Van Rooyen Consulting indicated that:

- a. The vegetation type, Marikana Thornveld occurs over a very large area and the small footprint required for the substation extension will have no large-scale negative impact on it;*
- b. Few alien plant infestations were observed on the site or in the near vicinity. Clearing of soil can always lead to some infestations;*
- c. No red data species were noted on site;*
- d. The project area is not listed as an Important Bird Area (IBA);*
- e. A non-perennial stream is located 1600m in the north western border of the corridor.*

This section details the environmental impacts expected, mitigation measures and procedures required for the substation extension. It will also address the methods that shall be used in the eradication of the invasive alien species observed on site.

5.1 ENVIRONMENTAL IMPACTS

- Vegetation may be impacted through removal and site disturbances during the construction activities, leading to shifts in vegetation community and habitat unit structures;*
- The collecting and harvesting of vegetation by construction teams;*
- The movement of heavy machinery will result in soil compaction that will modify habitats, destroy vegetation and inhibit re-vegetation;*
- Pollution of soils due to oil/fuel leaks and wastes can affect floral species;*
- Erosion of stockpiled topsoil and the disturbance of soils due to vegetation stripping will lead to habitat inundation;*
- Vegetation removal and associated habitat destruction would lead to habitat loss for avifauna;*
- The destruction of avifaunal nests when vegetation is being cleared;*
- Disturbances through construction activities that will displace various avi-faunal and fauna species.*

5.2 MANAGEMENT OBJECTIVES

- To minimize damage to vegetation;*
- To minimize possibility of erosion due to removal of vegetation;*
- To ensure alien plants do not become dominant in the project area and surrounding areas;*
- To control alien and invasive species dispersal and encroachment;*
- To promote the natural re-establishment and planting of indigenous species; and*
- To control the use of herbicides.*

5.3 MITIGATION MEASURES

5.3.1 Avifauna

- *The removal of large trees should be avoided as much as possible;*
- *Strict adherence to the Eskom standards and specifications is required;*
- *The construction of new roads should only be considered if existing road cannot be utilized.*
- *Access must be restricted to the footprint of the development, and access to the surrounding area must be strictly controlled.*

5.3.2 Wood Collection

- *The contractor and ECO must ensure no wood collection takes place (by construction workers for cooking);*
- *Workers should not stay on site and must be limited to the construction site as far as possible; and*
- *Hunting is prohibited and anyone caught hunting should be penalized or fined.*

5.3.3 Vegetation Clearance

- *Eskom must identify and demarcate the exact clearing of the servitude for the contractor to ensure that minimum de-bushing takes place;*
- *Selective bush clearing must take place, i.e. the entire servitude should not be cleared. Indigenous vegetation which does not interfere with the safe operation of the substation should be left undisturbed. Any intended vegetation clearance must be submitted as a plan of action to the ECO and the ECO must survey the area before the clearance to ensure that the sensitive species are conserved;*
- *The ECO and an ecologist should identify, locate all plants and natural features to be protected during construction. These features include wetlands, Drainage Lines and Aesthetically Significant Areas. Protect identified plants and natural features using danger tape and steel droppers;*
- *Large trees should not be removed without the permission of the ECO. In all areas, trees earmarked for removal prior to felling must be marked for approval by the ECO;*
- *Clear guidelines and proper plans must be given to the contractor. Daily inspections are needed to prevent problems;*
- *The Contractor will be held liable for the replacement of any plant or feature under the protection of these specifications that is removed or damaged by the Contractor's negligence or mismanagement.*
- *Where possible and without compromising the existing power lines, all existing large trees that fall outside of the earthworks should be conserved. These will assist in softening the local visual impact and aid in visual screening from distant viewpoints.*

- Disturbance to flora and fauna outside the servitude and access roads should not occur except where deemed unavoidable for the construction process;
- Plant demarcations should be maintained in position until the cessation of construction works;
- Construction camps should be located on the outside fringe of the riparian vegetation zone;
- No open fires are to be permitted under trees; and
- After construction the habitat restoration and re-vegetation plan should be used in disturbed areas.

5.4 ALIEN SPECIES MANAGEMENT

Table 3 of the Conservation of Agricultural Resources Act (CARA) lists all declared weeds and invader plants. Alien plants are divided into 3 categories based on their risk as an invader.

- I. Category 1 - These plants must be removed and controlled by all land users. They may no longer be planted or propagated and all trade in these species is prohibited.
- II. Category 2 – These plants pose a threat to the environment but nevertheless have commercial value. These species are only allowed to occur in demarcated areas and a land user must obtain a water use licence as these plants consume large quantities of water.
- III. Category 3 – These plants have the potential of becoming invasive but are considered to have ornamental value. Existing plants do not have to be removed but no new plantings may occur and the plants may not be sold.

A few alien species were observed on site and during the walk-down the ecologist should identify these species. Methods that can be used include the following:

5.4.1 Clearing Methods

- Different species require different clearing methods such as manual, chemical or biological methods or a combination of both.
- Care should be taken that the clearing methods used do not encourage further invasion. As such, regardless of the methods used, disturbance to the soil should be kept to a minimum. Fire is not a natural phenomenon at the site and fires should not be used as a clearing method or vegetation management approach at the site.

5.4.2 Herbicide Usage

- Only registered herbicides shall be used by trained applicators adhering to label specifications. Eskom's standard for herbicide management, ESKPBAAD4 shall be used as a guideline;
- The use of herbicides shall be in compliance with the terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (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;

- *The use of herbicides shall be restricted to the removal and control of alien vegetation, and shall not be permitted within identified sensitive areas;*
- *Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control;*
- *All care must be taken to prevent contamination of the water bodies. This includes due care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures;*
- *Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of in a suitable site; and*
- *To avoid damage to indigenous or other desirable vegetation, products should be selected that will have the least effect on non-target vegetation.*

5.4.3 Construction Works

- *The ECO is to provide permission prior to any vegetation being cleared for development;*
- *Cleared areas that have become invaded can be sprayed with appropriate herbicides provided that these break down on contact with the soil. Residual herbicides should not be used;*
- *Brush clearing of vegetation is not allowed within 32m of the wetlands;*
- *Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. Particular attention must be paid to imported material such as building sand or dirty earth-moving equipment;*
- *Stockpiles should be checked regularly and any weeds emerging from material stockpiles should be removed;*
- *Alien vegetation re-growth must be controlled throughout the entire site during the construction period; and*
- *Clearing activities must be contained within the affected zones and may not spill over into demarcated No Go areas.*

5.4.4 Operation

- *Surveys for alien species should be conducted regularly;*
- *All alien species identified should be cleared.*
- *Re-vegetation with indigenous, locally occurring species should take place in areas where natural vegetation is slow to recover or where repeated invasion has taken place.*
- *Areas of natural vegetation that need to be maintained or managed to reduce plant height or biomass, should be controlled using methods that leave the soil protected, such as using a weed-eater to mow above the soil level.*
- *No alien species should be cultivated on-site. If vegetation is required for aesthetic purposes, then non-invasive, water-wise locally-occurring species should be used.*

5.5 PERFORMANCE MEASURES

- *Fenced off areas are intact for the entire duration of construction works;*
- *On-going monitoring of weed/invasive species management;*
- *Record of clearing activities; and*
- *Decline in documented alien abundance over time.*

5.6 MONITORING

- *Alien species on site should be recorded during pre-construction;*
- *A daily inspection to ensure that alien vegetation is not spread to 'no-go' areas;*
- *Alien plant distribution and clearing measure should be recorded after every three months;*
- *Daily inspections on construction work areas; and*
- *The ECO should record all disturbances to essential habitats and vegetation communities.*

5.7 CORRECTIVE MEASURE

- *Refer to the Habitat Restoration and Re-vegetation Plan in Section 6.*

6 RE-VEGETATION AND HABITAT REHABILITATION PLAN

Marikana Thornveld is categorized as endangered as such a plant rescue and relocation plan is developed to promote the survival and abundance of plant taxa of concern. The re-vegetation and habitat rehabilitation plan indicates the procedures to be implemented for site restoration and re-vegetation. It outlines the appropriate site-specific methods to ensure that impacts on vegetation within the project's temporary work areas are minimized or avoided and that those areas affected by the construction activities are restored post-construction.

6.1 PLAN PROCEDURE

- *Follow up searches should be done to ensure that progress can be made based on the diversity of important plant taxa species that are found;*
- *During the final walk through, the ecologist should identify important taxa and physically mark such species in the field.*
- *A database of all captured reference points of important plant taxa for easy of location and transplantation should be compiled.*

6.2 PLANT RESCUE, REMOVAL AND TRANSPLANTATION

- *The size of the plant rescue workforce must be determined based on the number of important taxa that can be removed;*
- *Only conservation worthy plants need to be rescued as time constraints, budget and other limiting factors hinder the success of removal of all plant taxa. Therefore only plant taxa that are considered worthy of conservation need be considered;*
- *Follow-up surveys of important plant taxa need to be done within a short period of time before the initial clearing of the land is made as the construction phase commences;*
- *Where plants are too large or root structure too deep to be successfully removed, the seeds of such species can be collected and later sown in a plant transplantation site;*
- *Plant transplantation must be done immediately after the construction phase of the project is over;*
- *Important plant taxa that have been removed should be either transplanted to areas nearby, or grown in an off-site nursery to be replanted during re-vegetation and habitat rehabilitation of the project area; and*
- *Vegetation clearing must be restricted to the footprint of the construction site only.*

6.3 RE-VEGETATION AND HABITAT REHABILITATION

- *The seeds collected before the construction phase can also be replanted directly on site after the construction and during the operational phase of the substations and power lines when the re-vegetation and habitat rehabilitation plan is being implemented;*

- *Potential threats such as fires and alien plant invasion should be monitored to provide the ideal conditions of survival for important plant taxa that has been reintroduced in the site;*
- *Pre-construction imagery can be taken to determine the loss of natural landscape and later compared to the rehabilitated land to obtain an indication of overall success in re-vegetation and rehabilitation;*
- *The survival rate of transplanted and translocated flora (especially important taxa flora) can give an indication to the overall success of the re-vegetation and rehabilitation and provide important data to better future approaches;*
- *Permanent stabilization, i.e., re-vegetation will be done immediately after construction and no later than 14days post construction.*

6.4 PERMIT APPLICATION

All plant taxa of concern is protected by provincial and national legislation and ordinance and therefore a permit from the relevant authority needs to be obtained before any plant species can be removed or transplanted:

- *Plants which need to be transplanted that are individual trees which are protected in terms of the National Forest Act, Act 30 of 1998, need to be under a permit system and an application must be submitted to the Department of Water Affairs;*
- *Plants which need to be transplanted that are listed as threatened or protected species under the National Environmental Management Act: Biodiversity Act, Act 10 of 2004, need to be under a permit system and an application must be submitted to the relevant authority; and*
- *All required permits must be obtained from the relevant authority. Permits may be numerous and fit different aspects of the re-vegetation and habitat rehabilitation plan such as removal, handling, transportation and replanting.*

6.5 PERFORMANCE MEASURES

- *Weekly and monthly progress reports that include:*
 - *Estimated species coverage and diversity;*
 - *Species health;*
 - *Establishment of native species; and*
 - *The existence of weeds.*

6.6 MONITORING

- *For the first three months post-construction, all re-vegetated areas will be inspected weekly for failure until a dense cover of vegetation has been established; and*
- *After the three months, monitoring will be conducted on a monthly basis for the first year and will be reduced to a quarterly schedule.*

6.7 CORRECTIVE ACTION

- *If failure is noticed, the area will be re-vegetated again and kept free of alien species.*

7 HYDROLOGY AND WATER QUALITY

Non perennial rivers and the Bospoort Dam were observed within a 5km radius of the proposed project.

7.1 ENVIRONMENTAL IMPACTS

- *Water may be illegally abstracted from water bodies for construction activities such as dust suppression;*
- *Soil erosion from servitude clearing would increase sedimentation in local streams;*
- *Fuel, oil and other lubricants utilised during the extension of the substation can leak and pollute the underground water;*
- *Landscaping may have an indirect impact on the existing drainage lines and dry water courses by causing increased run off, erosion and limited seepage;*
- *Formation of new drainage lines may also take place due to obstructions to water flow; and*
- *Inadequate maintenance of sanitary ablutions may lead to ground water contamination.*

7.2 MANAGEMENT OBJECTIVES

- To minimise damage to stream embankments;*
- To minimise erosion of embankments and subsequent siltation of streams; and*
- To minimize or reduce ground water pollution.*

7.3 MITIGATION MEASURES

7.3.1 Spillages

- *Surface and groundwater should be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water and organic materials.*
- *It must be ensured that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage. All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil.*
- *In the event of a spillage, the contractor will be liable to arrange for competent individuals to clear the affected area. Responsibility for spill treatment lies with the contractor. Reference should be made to Section 8 for the clean-up measures;*
- *The individual responsible for, or who discovers a hazardous waste spill must report the incident to the ECO.*
- *In the event of a larger spill, Department of Water and Sanitation should be informed within 24 hours and they will in turn advise on the most effective method of cleaning the spill.*

7.3.2 Surface Water

- *Where possible site clearance should be scheduled in the drier season so as to reduce rainfall erosion potential which can lead to sedimentation of the water courses;*

- *No water may be abstracted from any surface water body for the purpose of construction unless permitted in terms of the Contract and Department of Water and Sanitation, or specifically authorized by the ECO;*
- *Over-wetting, saturation and unnecessary run-off during dust control activities should be avoided;*
- *Do not drain, fill or alter in any way, any wetland or drainage line, including the riverbanks unless instructed by the ECO;*
- *All waste produced during construction must be stored in appropriate containers and disposed of at the relevant disposal site;*
- *Berms and containment measures for fuels and oils should be placed around transformers to prevent spills during accidents and maintenance;*
- *Cleanup plan/strategy should be in place in the event that spills occur.*
- *Proper mobile ablution facilities should be in place to ensure that no sewerage spills into streams and wetlands. Collection pans should be placed underneath the mobile toilets to act as secondary containment;*
- *There should proper storage of material during construction and cleanup should be done after the construction is completed.*
- *Proper storm-water controls, erosion and sediment controls should be in place during the construction of the substation;*
- *All development footprint areas should remain as small as possible and should, ideally, not encroach onto sensitive wetland areas;*
- *It must be ensured that flow connectivity along the wetland features is maintained;*
- *Re-profiling of the banks of disturbed wetland areas; and*
- *Reinforce banks and drainage features where necessary with gabions, reno mattresses and geotextiles.*

7.3.3 Infrastructure

- *No roads shall be cut through wetlands and stream banks as this may lead to erosion causing siltation of streams.*
- *Adequate storm water drainage system must be designed and maintained to adequately control the volume, speed, location of runoff, to avoid soil erosion and siltation of water courses.*
- *No activity such as temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment or any other use of the buffer/flood zone whatsoever, may be permitted during the construction phase.*

7.4 PERFORMANCE MEASURES

- *No spillages recorded;*

- *Successful clean-up of spills; and*
- *Re-vegetation of disturbed riparian zones*

7.5 MONITORING

- *Site manager will undertake regular monitoring and maintenance of all sediment retention devices throughout the construction works to ensure the operation of such devices is optimized throughout construction works.*

7.6 CORRECTIVE ACTIONS

- *Immediately rehabilitate and stabilization of water course beds and banks where riparian vegetation has been removed along the non-perennial stream; and*
- *Remediate accidental spillages by using absorbent materials such as Cleansorb Peat oil Absorbent and Drizit supplied by Drizit.*

8 SPILLS PREVENTION MANAGEMENT PLAN

A spills prevention plan is an important tool which specifies the handling procedures, storage requirements and identifies clean-up procedures for areas and processes in which spills may potentially occur. The proposed substation extension will use hazardous substances which may leak and pollute the environment. This Section is prepared as a guideline on how to store, detect leakages and clean up spills before they cause irreversible damage.

Before construction starts, there is need to train the employees with regards to this plan. The following shall therefore be done:

- The contractor shall arrange for the site induction on the hazardous materials Awareness issues before commencement of the project.*
- The contractor shall ensure that adequate training of all the personnel working on the site familiarise with the contents of the spillage prevention plan which are outlined in this programme.*
- The contractor shall also make this training and awareness programme be conveyed to the personnel on site to the satisfaction of the Health and Safety Officer (HSO), either in written format or verbal, in the employees' language of choice.*
- Records of all training sessions, including names, dates and the information presented should be kept by the contractor.*

8.1 IMPACTS

The hazardous materials that may be used on site during construction and operation include:

- i. Vehicle fluids associated with the operation and maintenance of equipment. These materials are hazardous to humans, flora, fauna and sensitive environments such as streams/dams. These materials can be toxic when inhaled, flammable and combustible. Sources of spills include overflow of fuel from tank during re-fuelling of vehicles, seepage of fuel or lubricants during the servicing of equipment or vehicles and vehicle accidents;*
- ii. Chemical Toilets and Human Waste: Inadequate servicing of the mobile toilets or overflow of human waste which may contain infectious bacteria, pathogens and other health hazards can result in groundwater contamination. Chemicals used in cleaning the toilets can also be hazardous to the environment;*
- iii. Concrete used for the foundations contain limestone which is a storm water pollutant;*
- iv. Unknown Material: this includes sewerage pipelines, empty hazardous containers. These might have been buried underground within the Right of Way. Digging and trenching might damage the pipelines leading to soil and water contamination.*

8.2 SPILLS PREVENTION

8.2.1 Storage

- *Storage of hazardous materials will not take place within 500m of any water feature;*
- *Materials stored on site will be stored in their appropriate containers on bunded concrete floor. All containers should be labeled properly as to their contents;*
- *All hazardous materials will be stored in a secured, appointed area that is fenced and has restricted entry;*
- *In addition, hazard signs indicating the nature of the stored materials shall be clearly displayed on the storage facility or containment structure;*
- *Before containment or storage facilities can be erected, the contractor shall furnish the Engineer with details of the preventative measures which are proposed to be installed in order to mitigate against pollution of the surrounding environment from leaks or spillage;*
- *Location of the storage facilities should be noted/ indicated on the layout map of the construction site camp;*
- *Material Safety Data Sheets (MSDS) of all chemical materials should be available on site;*
- *All hazardous substance containers must be in good condition and compatible with the materials stored within;*
- *All hazardous substance containers must be accessible and spacing between containers must provide sufficient access to perform periodic inspections and respond to releases;*
- *Any spills on the exterior of the container must be cleaned immediately;*
- *All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the contractor to, and used or worn by the staff whose duty it is to manage and maintain the supplier's plant, machinery and equipment;*
- *Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions; and*
- *The contractor shall provide proof that relevant authorisation to store such substances has been obtained from the relevant authority.*

8.2.2 Vehicles

- *Vehicles re-fuelling should only occur on flat level ground on a concrete floor where there is little chance of a spilled substance reaching water features; and*
- *On-site vehicles will be monitored for fluid leaks and will receive regular maintenance to reduce the chance of leakages. All leaks should be cleaned in accordance with Department of Water and Sanitation guidelines.*

8.2.3 Disposal of Hazardous Substances

- *Non-PCB oils must be disposed of at a registered Class H:H hazardous waste site;*
- *Records of quantities disposed, disposal sites and dates, transporters used and safe disposal certificates must be kept and copies submitted to Eskom's Senior Environmental Advisor, Henry Nawa at Megawatt Park, Sunninghill; and*
- *Hazardous materials identified for disposal must not be stored for more than 60 days while preparations are made for final disposal.*

8.2.4 Maintenance

- *All hazardous substances must be stored inside buildings or under cover;*
- *Store hazardous substances not used daily in designated areas;*
- *All chemicals that are transferred from larger to smaller containers must be transferred by use of a funnel or valve.*
- *All hazardous substance containers should be closed while not in use;*
- *Use drip pans or other collection devices to contain drips or leaks from dispensing containers or equipment;*
- *Implement preventative maintenance activities to reduce the potential for release from equipment;*
- *Immediately clean up and properly manage all small spills or leaks;*
- *Periodically inspect equipment and hazardous substance storage areas to ensure leaks or spills are not occurring;*
- *Use signage to identify hazardous substance storage or waste collection areas;*
- *Keep all work areas and hazardous substance storage areas clean and in good general condition.*

8.2.5 Spill Response Equipment

- *Spill response equipment must be maintained and located in areas where spills are likely to occur;*
- *Spill kits should provide adequate response capabilities to manage any anticipated spill or release. The recommended oil spill kit shall contain the following:*
 - *2 pairs of latex or neoprene gloves;*
 - *20 heavy duty disposable bags;*
 - *1 shovel;*
 - *1 hard bristle broom;*
 - *absorbent pads;*

- 3 bags of absorbent material (cellulosic or other efficient material) ; and
- 1 pair of plastic goggles
- 25 x supersorb pads and 4 x drizit oil obs sox (which can also be used for spill clean-up on water bodies.
- Emergency response equipment should be inspected periodically to ensure that the spill kit is complete.

8.3 EMERGENCY PREPAREDNESS PLAN

In the event that a hazardous substance has been released, the following three procedures shall be implemented:

- i. Response;*
- ii. Clean-up; and*
- iii. Disposal.*

8.3.1 Response

- *Oil spill clean-up and rehabilitation shall be as set out in Eskom's standard, [ESKASABTO](#);*
- *Where necessary secure the site and contain the spill to avoid further pollution;*
- *Determine the spill boundaries, prevent unauthorized access to spill site and where required, notify all parties involved. The securing can be done by barricades, ropes, plastic taping or covers;*
- *Personnel on site should assess the situation to determine whether medical response is needed;*
- *Spills can only be contained and cleaned if the chemical and hazardous properties of the substance are known and if the spill is small and can be easily contained;*
- *The personnel dealing with the spill should use appropriate personal protective equipment and attempt to shut down the source of the spill if it is safe to do so;*
- *In the event that the spill cannot be contained or have injuries, the following contacts should be notified:*
 - *Fire Department;*
 - *Hospital;*
 - *Police;*
 - *ESKOM Environmental Advisor and Project Manager,*
 - *Department of Water and Sanitation;*
 - *The contractor and Health and Safety Officer should ensure that the contact numbers of the above mentioned are readily available on site.*
- *Personnel should evacuate the site and the emergency contacts should co-ordinate all activities.*

8.3.2 *Clean up and Disposal*

- *For spills in water resources, the ECO will co-ordinate clean up with a company that has experience and equipment to respond to such a spill;*
- *For oil releases in lined containment, the ECO shall co-ordinate with a licensed oil pumping, transport and disposal facility to have the liquid removed and properly disposed. The surface should be cleaned to minimize any residual oil;*
- *For oil releases to soil, the ECO shall oversee the excavation of the contaminated area. The contaminated soil shall be stored in containers that have lids before the soil is properly transported and disposed of at a hazardous landfill site.*

8.3.3 *Documentation*

All spills and clean up, procedures should be documented and should include the following:

- *Location of the spill;*
- *Individual reporting the spill;*
- *Source of the spill;*
- *Type and quantity released;*
- *Cause;*
- *Resources impacted; and*
- *Clean up procedures*

8.4 PERFORMANCE MEASURES

- *Incident reports;*
- *Disposal certificates;*
- *Records of disposal;*
- *Oil spill investigation report;*
- *Emergency Plans;*
- *Hazardous marked containers; and*
- *Drip pans.*

8.5 MONITORING

- *Weekly inspection of hazardous material storage areas to check for leakage;*
- *Daily on-site vehicle checks for fluid leaks;*
- *Regular inspection of the oil catchment area around the transformers; and*
- *Monthly audit reports on incident reports.*

8.6 CORRECTIVE ACTIONS

- *In the event of non-compliance, the ECO and Health and Safety Officer have to effectively or put more effort in ensuring that the above mentioned measures are implemented.*
- *The measures include prevention and emergency preparedness that can be used to address non-compliance; and*
- *Re-train the site personnel on performing activities and ensuring that the impacts are minimised.*

9 STORMWATER AND EROSION MANAGEMENT PLAN

Erosion and sedimentation are naturally occurring processes that are unnaturally accelerated by land development. Erosion is primarily influenced by four factors, i.e., climate, soil type, topography and vegetation.

This erosion control plan will address the discharge of sediment and other pollutants that are carried in run-off from the construction site. The plan will detail how to control sediment and other pollutants on the site by using control practices throughout the duration of the construction project and stabilization of the site. The storm water plan should include a description of management practices that will be installed during the construction phase to address the discharge of total suspended solids, control peak flow, provide for infiltrate, and maintain protective areas from the post-construction site.

9.1 ENVIRONMENTAL IMPACTS

Most significant alterations encountered during construction are the removal of vegetation that stabilizes the subsoil. In the absence of the vegetation, the underlying soils are fully or partially exposed to various forces such as rain, flowing water, wind and gravity. The design and construction of the substation can have significant impacts on water quality.

The predicted erodibility of the soils at the project area is low to moderate. The following impacts are expected:

- i. Site contamination through an overflow of fuel or chemical storage containers and contamination from the equipment and plant repair area into the surrounding natural drainage and water courses;*
- ii. Storm water run-off coming into contact with potential contaminated soils may flow into the nearby natural watercourses thereby reducing the water quality and quantity;*
- iii. Storm water with excessively increase or lower pH values could run-off from selected stockpiles;*
- iv. Removal of bulk material off site escaping from vehicles and polluting roads.*

9.2 MANAGEMENT OBJECTIVES

- To control the quality of surface water leaving the construction site such that no unacceptable impact occurs to adjoining watercourses, wetlands and local storm water system;*
- To minimize disturbance to the hydrologic regime of the surrounding landscape and minimize opportunities for storm water recycling on site; and*
- Protect groundwater from contamination which could result from construction activities; and*
- Minimise damage to topsoil and environment at substation site.*

9.3 PLANNING PHASE

- *Land disturbances should be limited to the servitude;*
- *Site access should be limited to the minimum number of entry and exit points required;*
- *Vegetation in and adjacent to the drainage lines should be maintained to improve the quality of run-off before the water bodies and protect the drainage lines from erosion;*
- *To allow native seeding to occur, the contractor should use temporary covering, re-vegetation and filter barriers on stockpiles where they are stored for an appropriate period of time;*
- *The gravel access roads are particularly at risk during the wet weather due to heavy construction vehicles gaining access. In the event that they are damaged, they must be repaired by the contractor to the written satisfaction of the ECO and the landowner.*

9.3.1 Spoil Sites

- *The contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site used during the contract period. This shall include existing spoil sites that are being re-entered;*
- *Before spoil sites may be used, proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the Engineer for approval;*
- *A photographic record shall be kept of all spoil sites for monitoring purposes, and must include photographs of before the site is used, as well as after re-vegetation;*
- *The affected landowner must be consulted and must provide consent for the location of these spoils sites on his property;*
- *No spoil site shall be located within 500 m of any watercourse;*
- *The use of spoil sites for the disposal of hazardous or toxic wastes shall be prohibited;*
- *Spoil sites will be shaped to fit the natural topography. These sites shall receive a minimum of 75 mm topsoil and be grassed with the recommended seed mixture. Slopes shall not exceed a vertical: horizontal ratio of 1:2. Only under exceptional circumstances shall approval be given to exceed this ratio;*
- *Appropriate re-vegetation measures to minimise soil erosion will be undertaken by the Concessionaire. This will include either strip sodding or seeding or full sodding.*
- *The Engineer may only approve a completed spoil site at the end of the construction period upon receipt from the contractor of a landowner's clearance notice and an engineer's certificate certifying slope stability.*

9.3.2 Stockpiles

- *Topsoil is to be handled twice only – once to strip and stockpile, and once to replace and level;*
- *Ensure that all topsoil is stored in such a way and in a place that it will not cause the damming up of water, erosion gullies, or wash away itself;*
- *Do not stockpile topsoil in heaps exceeding 2m in height;*
- *In determining the location of these temporary stockpile areas, cognisance must be taken of sensitive and no-go areas such as drainage lines;*
- *Ensure that topsoil is at no time buried, mixed with spoil (excavated subsoil), rubble or building material, or subjected to compaction or contamination by vehicles or machinery. This will render the topsoil unsuitable for use during rehabilitation;*
- *The Contractor will be held liable for the replacement of any topsoil rendered unsuitable for use during rehabilitation, for reasons due to his negligence or mismanagement on site;*
- *Should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material shall be indicated and demarcated on the site plan and submitted in writing to the Engineer for approval, together with the proposed measures for prevention, containment and rehabilitation against environmental damage;*
- *Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of these temporary stockpiles, the contractor shall at all times ensure that they are:*
 - positioned and sloped to create the least visual impact;*
 - constructed and maintained so as to avoid erosion of the material and contamination of the surrounding environment; and*
 - kept free from all alien/undesirable vegetation.*
- *After the stockpiled material has been removed, the site shall be re-instated to its original condition.*
- *No foreign material generated/deposited during construction shall remain on site. Areas affected by stockpiling shall be landscaped, top soiled, grassed and maintained at the contractor's cost until clearance from the ECO is received.*

9.4 EROSION AND SEDIMENT CONTROL

- *Excavation activity should be completed in periods of dry weather;*
- *All areas susceptible to erosion should be protected and there should be no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas;*
- *Natural trees, shrubbery and grass species should be retained wherever possible;*
- *Do not permit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the Work Area;*

- *Avoid access into seasonally wet areas and / or turf soils during and immediately after rainy periods, until such a time that the soil has dried out;*
- *Cleared, grubbed and graded construction areas should be stabilized and erosion controls immediately after these activities are done. These areas should be stabilized with mulch or re-vegetated with temporary vegetation or erosion control blankets;*
- *Do not allow erosion to develop on a large scale before effecting repairs. When in doubt, seek advice from the ECO; and*
- *The following methods should be used for control.*

9.4.1 Sediment Fences

- *These fences should be used where temporary sediment control is required. The fences will dissipate storm water velocity collecting moving solids ; and*
- *Sediment fences will be placed downstream of stockpiles and disturbed areas. Prior to construction, the ECO and engineer will provide a map indicating these areas.*

9.4.2 Fencing

- *Areas selected for protection will be fenced and protected throughout the duration of the construction period.*

9.5 STORMWATER CONTROL

- *Consideration should be given to the creation of artificial wetlands for the treatment of storm water run-off, particularly from areas where fertilizers, herbicides and pesticides are likely to be used;*
- *Measures such as vegetated swales and cut-off drains must be provided in order to help divert poor quality storm water runoff to artificial wetlands, if created on site. Vegetative swales can help reduce runoff velocity, thereby allowing for better infiltration capability;*
- *Rainwater runoff from roofs of construction camp buildings must be directed into rainwater tanks, this water can be used for dust control;*
- *The provision of rainwater tanks is recommended to help store away excess water, which may create potential for flooding;*
- *Ensure that no existing wetlands, are destroyed as these features have tremendous capacity to absorb and later release water generated by flash floods in natural pulses.*

9.6 REHABILITATION

- *On completion of construction, temporary structures such as sediment traps should be removed by removing all silt material from the base of the trap, removing the trap wall and filling the trap with compacted fill;*

- *The temporary structures shall only be removed following stabilization of disturbed areas not when top soiling or grassing; and*
- *Maintenance of rehabilitated areas shall continue until vegetation is well established.*
- *Rehabilitation should be made to the satisfaction of the landowner*

9.7 PERFORMANCE MEASURES

- *Control structures constructed and operational to earthworks commencing;*
- *All stockpiled material adequately stabilized and protected; and*
- *All site cut-off drains unobstructed.*

9.8 MONITORING

- *On-going monitoring of erosion and sediment control measures to determine their effectiveness;*
- *Daily visual inspection of sediment control devices;*
- *Remove spilled soils and other materials.*

9.9 CORRECTIVE ACTIONS

- *Immediately re-instate appropriate erosion and sediment control devices after the identification of a failure;*
- *Immediately install appropriate erosion and sediment control devices if erosion or sedimentation has occurred in an area that has not had adequate measures installed;*
- *Stabilize areas that have suffered erosion or sediment build up followed by the installation of correct erosion and sediment control devices for the area until it has reached stabilization and adequately rehabilitated.*

10 WASTE MANAGEMENT

Effective waste management is required to ensure the prevention of pollution and ecological degradation. An integrated approach is required to minimise and manage waste and the associated risks in an environmentally acceptable manner.

10.1 ENVIRONMENTAL IMPACTS

Any construction work generates solid waste, which can spread through the environment. Solid waste generation at the substations will include metal scraps, wooden packing material. Main liquid waste is the oil waste, transformer oil and sewerage.

10.2 MANAGEMENT OBJECTIVES

- i. To keep the servitude clean and neat;*
- ii. Disposal of rubble and refuse in an appropriate manner; and*
- iii. Ensure that proper sanitation is achieved.*

10.3 MITIGATION MEASURES

10.3.1 Site Offices

- Recycling bins shall be made available within the site working area;*
- No waste shall be burned at the site offices, or anywhere else on the site; and*
- Site amenities shall be made available on site as required.*

10.3.2 Waste Disposal

- The contractor's intended methods for waste management and waste minimisation must be implemented at the outset of the contract, and approved by the ECO;*
- All personnel shall be instructed to dispose of all waste in the proper manner;*
- Solid waste shall be stored in a designated area covered, tip proof metal drums for collection and disposal;*
- Signs will be located on each bin indicating type of bin and what waste may be placed in that bin;*
- A bin system shall be established through the use of the separation bins for recyclable materials and non-recyclable waste materials. Materials collected for recycling should include:*
 - i. Aluminium cans;*
 - ii. Glass;*

- iii. *Plastics*
- iv. *Cardboard; and*
- v. *Paper*

- *The recyclable waste can be disposed at recycling centers near the project area;*
- *Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse;*
- *At all places of work, the contractor shall provide litter collection facilities for later safe disposal at approved waste disposal sites.*
- *The contractor shall ensure that no litter is disposed of within quarries or borrow pits; and*
- *A schedule for waste collection should be established to prevent the containers from over filling.*

10.3.3 Hazardous Waste Disposal

- *Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery should be collected in a holding tank and returned to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, should be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials;*
- *Oil collected by a mobile servicing unit should be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company;*
- *Non –PCB oils must be disposed of at a registered Class H:H hazardous waste site;*
- *Records of quantities disposed, disposal sites, disposal dates, transporters used and safe disposal certificates must be kept and copies submitted to Eskom's Environmental section in Sunninghill;*
- *Hazardous materials identified for disposal must not be stored for more than 60 days while preparations are made for final disposal;*
- *Should hazardous waste be stored for longer than 60 days the Environmental section needs to be notified at the following numbers **011 800 5601** ; and*
- *All oil containment equipment must be labelled indicating its PCB status.*

10.3.4 Liquid Waste

- *Ensure that adequate numbers of conveniently located site toilets are available on all work sites at all times in quantities related to the number of users; 1 toilet per 30 users;*
- *Do not locate any site toilet, sanitary convenience, within the 1:100 year flood line, or within a horizontal distance of 500m of a watercourse, drainage line or wetland; and*
- *Maintain and clean site toilets regularly as is required to keep them in good, functional working order and in an acceptable state of hygiene.*

10.4 PERFORMANCE MEASURES

- *The waste system is in place prior to any waste generation works;*
- *No waste/ litter on site;*
- *Safe disposal certificates;*
- *Mobile toilets on site;*
- *Labelled bins and*
- *All waste disposed of appropriately.*

10.5 MONITORING

- *Monitor waste pathways to ensure correct application of reuse and recycling.*

10.6 CORRECTIVE ACTION

- Where non-compliances in construction waste management are identified, the Waste Management Plan is to be updated and all workforce personnel are to be inducted to the amendments.

11 OPEN SPACE MANAGEMENT

To achieve the goal of a healthy ecosystem, open space within the project area will be managed. This will be done by:

- *Preventing uncontrolled fires that may result in destruction of the ecosystem including human lives and property;*
- *Maintain or enhance visual resource values;*
- *Restrict the introduction of non-native species. Parts of the project area are characterised of Invasive Alien Species (IAS). There is need to prevent their spread into and domination of open space; and*
- *Protect known and unknown artefacts.*

11.1 MANAGEMENT OBJECTIVES

- i. To focus on preserving and restoring native ecosystems;*
- ii. To protect and promote natural biodiversity; and*
- iii. To provide a balance between works and the capacity of nature.*

11.2 LAND CATEGORY CHARACTERISTICS

The project area is basically characterised of severely modified vegetation and this is largely due to mining, settlements and agricultural activities. Controls should be established in these areas.

11.3 RESOURCE PROTECTION AND PRESERVATION

- *No motorised vehicular traffic is allowed in areas without access tracks or roads;*
- *Plants and other natural features are not to be disturbed or removed unless authorised by the ECO;*
- *Disposing, burying or burning of trash in open space is prohibited;*
- *Trapping animals is prohibited; and*
- *Natural vegetation communities shall be maintained. Planting native species shall be encouraged during rehabilitation to restore damaged areas.*

11.4 PROTECTED HABITAT AREAS

- *Vegetation control measures associated with invasive species control or fire prevention will be closely monitored to ensure damage to these habitats is minimised;*

- *Fencing or other forms of demarcation shall be used to divert employees away from sensitive areas.*

12 AIR MANAGEMENT

12.1 ENVIRONMENTAL IMPACTS

The generation of dust from the site can be a major nuisance to local activities as well as creating unacceptable working conditions and causing the loss of topsoil. The key impacts to this issue are as follows:

- i. Emissions of dust due to traffic movement;*
- ii. Emissions of dust due to wind erosion to stockpile material and exposed soil;*
- iii. Emissions of volatile gases and odours from exposure of handling contaminated soils and water.*

12.2 MANAGEMENT OBJECTIVES

- To minimize the generation of dust on the project site; and*
- To minimize all potential odour issues relating to contaminated soil and water.*

12.3 MITIGATION MEASURES

12.3.1 Site Preparation

Before the commencement of any site works and during the operation as much vegetation as possible should be retained including patches and strips to minimize dust. Dust emissions can be controlled using the following procedures:

- Before any site works commence, the ECO should plan and locate the vegetation cover that needs to be retained;*
- Vegetation should be protected by fencing or blocking off from the rest of site operations;*
- In areas where work has not commenced, original vegetation cover should be maintained as long as possible. Retaining low or sparse vegetation is effective at dissipating wind velocity at the ground surface where dust lift off occurs;*
- Spray earthworks, roads and other surfaces as necessary with water.*

12.3.2 Vegetative Stabilisation

- Where areas are cleared, established plants should be transplanted to areas that need vegetation.*

12.3.3 Timing of Development

- *Topsoil stripping should not be carried out near Boitekong Township during adverse wind conditions. Topsoil should be stripped in discrete sections allowing buffer strips between clearings.*

12.3.4 Wind Barriers

- *Wind barriers should be placed perpendicular to the direction of the prevailing wind;*
- *Porous barriers should be used as they provide smaller reductions in velocity for more extended distances;*
- *Wind barriers to be used should be at least 2 metres high; and*
- *The screening material should have a porosity of 50% or less.*

12.3.5 Dust Control

- *Exposed surfaces should be kept moist by spraying with water and dust suppressant;*
- *Exposed surfaces and stockpiles left for long should be stabilised by sealing, seeding or spraying with water or dust suppressant; and*
- *Combustible waste material shall not be burnt on site.*

12.3.6 Earth moving Management

- *Do not commence or continue with earth moving activities in adverse weather conditions;*
- *Use balanced cut and fill operations to reduce off-site hauling;*
- *All vehicles shall not exceed the maximum speed limit of 40km/h within the site;*
- *Trucks transporting loose material to and from the site should be covered; and*
- *Vehicles should be well serviced to avoid excessive emissions.*

12.3.7 Stockpiles

- *Stockpiles should be covered, however where they are located in open areas the height and slope should be limited to reduce wind pick up;*
- *Stockpiles should be oriented lengthwise into the wind so they offer the minimum cross sectional area to prevailing winds;*
- *Wind barriers should be installed on three sides of the stockpile;*
- *Activity should be limited to the downside of the stockpile;*
- *Transfer points should be minimized.*

12.3.8 Watering

- *The surface should be dampened to prevent dust from becoming airborne but should not be wet to the extent of producing run-off;*
- *Use watering sprays on materials to be loaded and during loading; and
Real time automated response systems should be used to turn on water cannon systems in response to dust levels or high wind speeds.*

12.4 PERFORMANCE MEASURES

- *No visible dust within the project site;*
- *No visible loose material from trucks;*
- *No fires on site; and*
- *No complaints from the public.*

12.5 MONITORING

- *The site manager and ECO should carry out a weekly inspection during site preparation;*
- *Daily inspection by the site manager and ECO to monitor activities for dust generation and moisture content of exposed areas;*
- *Continuous monitoring by the ECO and the site manager with regards to fires caused by burning of waste;*
- *Pre-construction inspection and maintenance as required for construction vehicles.*

12.6 CORRECTIVE ACTION

- *If a complaint is received, the site manager and ECO shall ensure that additional monitoring of the existing measures is implemented.*

13 ARCHAEOLOGICAL MANAGEMENT

Development traverses across an area that is severely modified with potsherds of very low significance noted.

13.1 MANAGEMENT OBJECTIVE

- i. To protect graves, objects and land considered to be of cultural value.*

13.2 MITIGATION MEASURES

*Site specific measures in terms of archaeological resources of the proposed area, as identified by **Munyadziwa Maguma** (Tel: 082 535 6855) must be implemented on site*

- An archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should supervise the excavations of the towers and substations; and*
- Should any undisturbed subsurface archaeological material be exposed during the construction activities, the archaeologist must activate all necessary mitigation measures to salvage such exposed heritage remains.*

13.3 PERFORMANCE MEASURES

- No disturbed objects and graves; and*
- Cessation of works in the area that an archaeological object is exposed.*

13.4 MONITORING

- Visual monitoring by the site manager, the ECO and the archaeologist during excavation activities.*

13.5 CORRECTIVE ACTION

- The ECO and archaeologist should be notified of any excavated objects.*

14 NOISE

14.1 ENVIRONMENTAL IMPACTS

Vehicle movements, generators, and heavy machinery will generate noise during construction.

14.2 MANAGEMENT OBJECTIVE

- i. To minimize the generation of noise from construction activities.*

14.3 MITIGATION MEASURES

14.3.1 Working Hours

- The contractor must inform adjacent residents of any unusually noisy activities that will be undertaken during the construction phase;*
- No work shall be performed outside the permitted working hours.*

14.3.2 Plant and Equipment

- All machinery, including earthmoving vehicles should be regularly maintained to reduce noise intensity;*
- Installation of sound vibration detectors on plant machinery is recommended;*
- Construction vehicles must use designated entry and exit routes so that noise impacts can be largely confined to specific access routes; and*
- The contractor should ensure that construction workers use ear plugs.*

14.4 PERFORMANCE MEASURE

- No complaints received from the public.*

14.5 MONITORING

- Routine inspections of plant and equipment; and*
- Any noise complaints received from the public should be recorded, reported and monitored.*

14.6 CORRECTIVE ACTION

- In the event of complaints, the site manager should carry out additional monitoring.*

15 INFRASTRUCTURE

The use of the road network will play a large role in delivering materials and resources to the construction camp during construction. An increase in traffic volumes is expected to be minimal and short term, during the construction period. Excavation and erection of structures may destroy or damage telephone lines, reticulation power lines and bulk water supply infrastructure located within the project area.

15.1 MANAGEMENT OBJECTIVES

- i. To control activities in close proximity to private property and servitudes; and*
- ii. To minimize damage to existing access roads; and minimize damage to environment due to construction of new access roads.*

15.2 MITIGATION MEASURES

- Where pipe lines at the site, the depth of the pipes under the surface shall be determined to ensure that proper protection is afforded to such structures. Any damage to pipe lines shall be repaired immediately;*
- All existing private access roads used for construction purposes, shall be maintained at all times to ensure that the local people have free access to and from their properties.*
- Speed limits shall be enforced in such areas and all drivers shall be sensitised to this effect; and*
- Power cuts to facilitate construction must be carefully planned. If possible disruptions must be kept to a minimum and should be well advertised and communicated to the residents.*

15.3 PERFORMANCE MEASURES

- Number of incidences reported; and*
- No complaints received from the public.*

15.4 MONITORING

- The site manager and ECO should undertake general inspection of infrastructure to check for damage on infrastructure.*

15.5 CORRECTIVE ACTION

- *If complaints are received, it is the responsibility of the contractor to repair the damaged infrastructure in consultation with the relevant authority or landowner.*

16 VISUAL

Part of the study area is characterized by human settlements and their associated activities such as subsistence agriculture and existing electrical structures. The extension of the substation will result in visual intrusion for the residents, motorists and tourists. It is, thus, necessary to maintain a near natural visual landscape, with limited aesthetic affects.

16.1 MANAGEMENT OBJECTIVE

- i. To maintain an aesthetically pleasing works area, camp site and storage area.*

16.2 MITIGATION MEASURES

16.2.1 Access Roads

- Access for construction traffic will be required and maintained to all sites during the construction phase.*
- Where there is no existing access available or where ground conditions prevent normal access, temporary access routes may have to be constructed. The preferred option is a two track dirt road.*
- Access routes should be located so as to limit modification to the topography and to avoid the removal of established vegetation;*
- Maintain no or minimum cleared road verges;*
- Access routes should be located on the perimeter of disturbed areas such as cultivated/fallow lands as not to fragment intact vegetated areas; and*
- If it is necessary to clear vegetation for a road, avoid doing so in a continuous straight line. Alternatively, curve the road in order to reduce the visible extent of the cleared route.*

16.2.2 Site Camp Establishment

- The location of the construction site must be negotiated with the relevant landowners and specifications of the land owner must be adhered to;*
- If practically possible, locate construction camps in areas that are already disturbed or where it is not necessary to remove established vegetation like for example, naturally bare areas;*
- Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitivity visual receptors;*
- Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance; and*
- Screen the construction camp and lay-down yards by enclosing the entire area with a dark*

green or black shade cloth of no less than 2 m height.

16.3 PERFORMANCE MEASURES

- *Rehabilitate areas around the substation;*
- *Vegetated area around the substations; and*
- *Neat site camp.*

16.4 MONITORING

- *Routine inspection of site camp; and*
- *Weekly inspections on rehabilitated areas.*

16.5 CORRECTIVE ACTIONS

- *Repair damaged site fences; and*
- *The ECO should identify the causes of problems and address them accordingly, for example should rehabilitation of areas around the substation fail, the ECO should identify other methods or ways to rehabilitate the area until rehabilitation is successful.*

17 HEALTH AND SAFETY

Health of construction workers may be at risk if appropriate clothing or equipments are not used for specific activities. Construction activities will result in increased traffic in the area, particularly from heavy vehicles, as well as disruptions to traffic flow along affected roads. This increase in traffic together with construction activities such as open trenches will lead to an increase in safety risks for local residents, motorists and passengers.

17.1 MANAGEMENT OBJECTIVES

- i) To promote good health; and*
- ii) To ensure security of workers and community.*

17.2 MITIGATION MEASURES

17.2.1 Construction

- The specifications included under this section do not exempt the Contractor from complying with all the Regulations as included in the Occupational Health and Safety Act (Act 85 Of 1993). The contractor is further referred to this Act and all its regulations;*
- The safety of all construction and operational personnel, as well as any member of the public on the site is the responsibility of the Contractor;*
- Access onto and off the site should be controlled by means of a register system. This includes visitors;*
- The contractor and Health and Safety Officer (HSO) should ensure that first aid / emergency facilities / procedures are in place;*
- The HSO should ensure that all personnel are trained in basic site safety procedures;*
- A register with contact numbers of all people employed and one relative for each should be kept on site;*
- A list of all relevant emergency numbers should be kept in an easily accessible location on site;*
- A record of all incidents, accidents and illnesses on site shall be kept and the information shall be made available at meetings;*
- The HSO should ensure that proper footwear is worn by employees at all times.*
- The site manager shall ensure that employees are issued with and make use of the necessary safety equipment when working in dusty, noisy and / or dangerous situations. Such equipment may include, but is not necessarily limited to hardhats, goggles, masks, earplugs, gloves, safety footwear and safety ropes as required;*

- *The site manager shall ensure that adequate drinking water, wash water and sanitary facilities are available at all times and on all work sites;*
- *The site manager shall provide a designated place for food storage, preparation and consumption on site. This should be a shaded area;*
- *The site manager shall ensure that personnel are transported legally, and in a safe and responsible manner;*
- *The site manager shall ensure that all vehicle and machine operators are qualified and licensed to operate their vehicles / machines;*
- *Dangerous excavations or works that may pose a hazard to humans and animals must be protected. These areas must be demarcated with hazard tape or fencing as required and the appropriate danger signs must be posted.*
- *The contractor/ site manager must respect workers' right to refuse to work in unsafe conditions.*
- *Ensure that strict safety measures are employed around open trenches and excavations;*
- *Implement regulated traffic safety procedures; and*
- *Minimise extent of roadside disruptions on adjoining roads where possible in order to allow for normal traffic flow.*

17.2.2 Operation

- *The safety of all operational personnel, as well as any member of the public on the site is the responsibility of the Eskom;*
- *Eskom should ensure that first aid / emergency facilities / procedures are in place;*
- *Eskom should ensure that all personnel are trained in basic site safety procedures;*
- *Eskom should ensure that proper footwear is worn by employees at all times;*
- *Eskom should ensure that employees are issued with and make use of the necessary safety equipment when working in dusty, noisy and / or dangerous situations. Such equipment may include, but is not necessarily limited to hardhats, goggles, masks, earplugs, gloves, safety footwear and safety ropes as required;*
- *Eskom should ensure that personnel are transported legally, and in a safe and responsible manner;*
- *Eskom should ensure that all vehicle and machine operators are qualified and licensed to operate their vehicles / machines; and*
- *Eskom should respect workers' right to refuse work in unsafe conditions.*

17.3 PERFORMANCE MEASURES

- *Site personnel have adequate safety clothing;*

- *No accidents recorded; and*
- *Demarcated or fenced excavation areas.*

17.4 MONITORING

- *Daily inspection of construction areas to ensure that all safety precautions are in place;*
- *Daily inspection of personnel to ensure that they utilize safety clothing.*

17.5 CORRECTIVE ACTIONS

- *If complaints are received, it is the responsibility of the contractor and HSO to address the problems in consultation with the employees/personnel;*
- *Repair the mesh fence used to demarcate all and all excavated areas.*

18 DECOMMISSIONING AND CLOSURE

It is highly unlikely that this development will be decommissioned.

18.1 ENVIRONMENTAL IMPACTS

- *Any deconstruction work generates solid waste, which can spread through the environment. Solid waste generation at the substations will include metal scraps, wooden packing material. Main liquid waste is the oil waste, transformer oil and sewerage.*
- *Oil or fuel leakages from maintenance vehicles will contaminate soils; and*
- *Servitude clearing would increase soil erosion by surface run-off.*

18.2 MITIGATION MEASURES

- *All the measures that have been stated in previous Sections shall be used.*

19 CONCLUSION

Should these recommended measures be adopted in the planning, construction, operation/maintenance and decommissioning phases of the proposed activity, DIGES finds that the predicted impacts of the proposed activities are within acceptable limits.

It should be noted however, that environmental management is dynamic and as such the EMPr must be flexible in order to accommodate changing circumstances and requirements. Ongoing environmental monitoring of the substation should be carried out throughout its life cycle, and such should be conducted by a dedicated Environmental Control Officer, to identify and address new issues as they arise, and to update or amend the management plan accordingly.

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