

**DRAFT**

**GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME  
REPORT**

**PROPOSED ELECTRICAL LINE OF 2 X 400 kV WHICH RUNS FROM  
ARIES SUBSTATION NEAR KENHARDT TO UPINGTON  
SUBSTATION NEAR UPINGTON, IN THE KAI GARIB AND KHARA  
HAIS LOCAL MUNICIPALITY, MGCAWU DISTRICT MUNICIPALITY,  
NORTHERN CAPE PROVINCE**

**Green Gold Ref: GGG24/34**

**Report Date: 2024 09 30**

**PREPARED BY:**

**GREEN GOLD GROUP (PTY) LTD**

**PREPARED FOR:**

**ESKOM HOLDINGS SOC LTD**



PROJECT DETAILS	
<b>Project Title</b>	Proposed electrical line of 2 X 400 kV which runs from the Aries substation NEAR Kenhardt to the Upington substation near Upington, in the Kai Garib and Khara Hais Local Municipality, Mgcawu District Municipality, Northern Cape Province
<b>Applicant</b>	Eskom Holdings SOC Ltd
<b>Environmental Assessment Practitioner</b>	Lloyd Malatji-EAPASA-2023/6585
<b>Report Status</b>	<b>Draft</b> Generic Environmental Management Programme Report
<b>Date</b>	<b>2024 09 30</b>

## DETAILS OF THE ENVIRONMENTAL TEAM

ENVIRONMENTAL ASSESSMENT PRACTITIONER	
<b>Name:</b>	Lloyd Malatji
<b>Contact Number:</b>	0658043521
<b>Telephone Number:</b>	012 844 0248
<b>Physical address:</b>	Office M62, Innovation Building 1 Mark Shuttleworth Street Lynnwood, Pretoria
<b>Postal address:</b>	PO Box 65384, Erasmusrand, Pretoria, 0165
<b>E-mail:</b>	<a href="mailto:eias@greengoldgroup.co.za">eias@greengoldgroup.co.za</a> <a href="mailto:Lloyddm@greengoldgroup.co.za">Lloyddm@greengoldgroup.co.za</a>
<b>Qualifications:</b>	Advanced Diploma in Environmental Sciences
<b>Professional Affiliations</b>	EAPASA Reg. No: 2023/6585 SACNASP Reg No: 161345
<b>Experience</b>	4 years

ENVIRONMENTAL CONSULTANT	
<b>Name</b>	Ms. Lebohang Moiloa
<b>Contact Number:</b>	073 232 4312
<b>Telephone Number:</b>	012 844 0248
<b>Physical address:</b>	Office M62, Innovation Building 1 Mark Shuttleworth Street Lynnwood, Pretoria
<b>Postal address:</b>	PO Box 65384, Erasmusrand, Pretoria, 0165
<b>E-mail:</b>	<a href="mailto:Lebo@greengoldgroup.co.za">Lebo@greengoldgroup.co.za</a>
<b>Qualifications:</b>	MBA MSc: Geography BSc Hons: Geography (Environmental Management) BSc: Physics and Geography
<b>Professional Affiliations</b>	Professional Natural Scientist (Pr.Sci.Nat.). Reg. No. 400146/08 International Association for Impact Assessment (IAIAsa). Reg. No. 1624 EAPASA Registration application under review
<b>Experience</b>	24 years

ENVIRONMENTAL CONSULTANT	
<b>Name:</b>	Thato Mdluli
<b>Contact Number:</b>	073 561 7331
<b>Telephone Number:</b>	012 844 0248

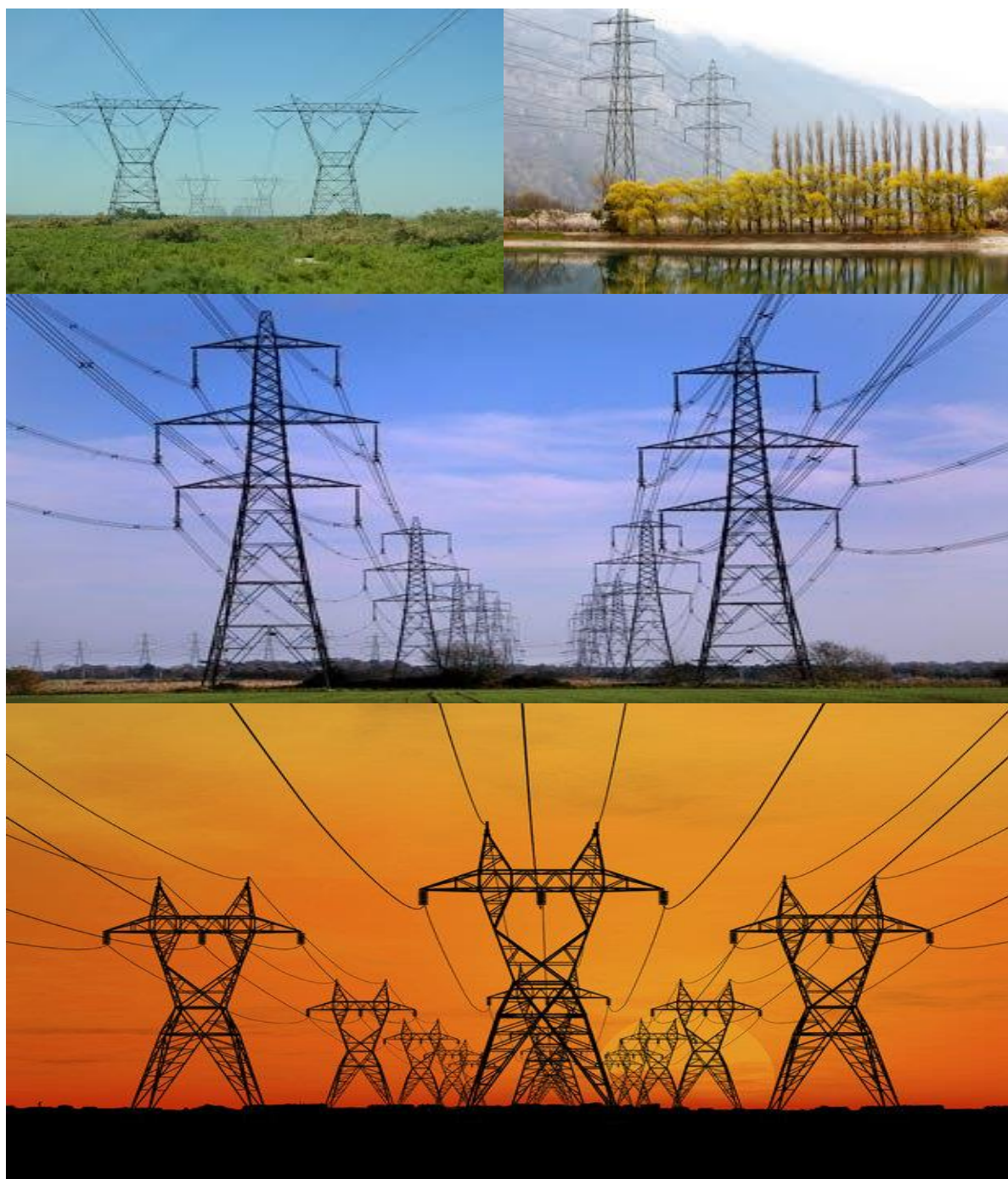
<b>Physical address:</b>	Office M62, Innovation Building 1 Mark Shuttleworth Street Lynnwood, Pretoria
<b>Postal address:</b>	PO Box 65384, Erasmusrand, Pretoria, 0165
<b>E-mail:</b>	<a href="mailto:thatom@greengoldgroup.co.za">thatom@greengoldgroup.co.za</a>
<b>Qualifications:</b>	BSc Honours in Geography Bachelor of Science in Environmental Sciences
<b>Professional Affiliations</b>	Candidate Natural Scientist (Cand.Sci.Nat). Reg. No. 153152 International Association for Impact Assessment (IAIAsa). Reg. No. 7629
<b>Experience</b>	3 years

This document is issued in compliance with the requirement of NEMA - EIA Regulations, 2014, as amended. The document has been produced by *Green Gold Group (Pty) Ltd* for the applicant, Eskom Holdings SOC Ltd.

The intellectual property contained in this document remains vested in *Green Gold Group*. It should not be reproduced in any manner without the consent of *Green Gold Group* or the applicant, Eskom Holdings SOC Ltd.

APPENDIX 1  
GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE  
DEVELOPMENT AND EXPANSION FOR OVERHEAD ELECTRICITY  
TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

---



**environmental affairs**

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

## TABLE OF CONTENTS

INTRODUCTION .....	1
1. Background .....	1
2. Purpose .....	1
3. Objective .....	1
4. Scope.....	1
5. Structure of this document.....	2
6. Completion of part B: section 1: the pre-approved generic EMPr template.....	4
7. Amendments of the impact management outcomes and impact management actions .....	4
8. Documents to be submitted as part of part B: section 2 site specific information and declaration .....	5
(a) Amendments to Part B: Section 2 – site specific information and declaration .....	5
PART A – GENERAL INFORMATION.....	6
1. DEFINITIONS .....	6
2. ACRONYMS and ABBREVIATIONS .....	7
National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004) .....	7
3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION .....	8
4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE .....	14
4.1 Document control/Filing system .....	14
4.2 Documentation to be available .....	14
4.3 Weekly Environmental Checklist.....	14
4.4 Environmental site meetings .....	15
4.5 Required Method Statements .....	15
4.6 Environmental Incident Log (Diary) .....	16
4.7 Non-compliance .....	16
4.8 Corrective action records.....	17
4.9 Photographic record .....	17
4.10 Complaints register .....	18
4.11 Claims for damages.....	18
4.12 Interactions with affected parties .....	18
4.13 Environmental audits .....	19
4.14 Final environmental audits .....	19
PART B: SECTION 1: Pre-approved generic EMPr template .....	20
5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS .....	20
5.1 Environmental awareness training .....	21

5.2	Site Establishment development .....	23
5.3	Access restricted areas .....	24
5.4	Access roads.....	25
5.5	Fencing and Gate installation .....	28
5.6	Water Supply Management .....	33
5.7	Storm and waste water management.....	35
5.8	Solid and hazardous waste management .....	37
5.9	Protection of watercourses and estuaries.....	39
5.10	Vegetation clearing.....	42
5.11	Protection of fauna .....	48
5.12	Protection of heritage resources .....	52
5.13	Safety of the public .....	53
5.14	Sanitation .....	54
5.15	Prevention of disease .....	56
5.16	Emergency procedures.....	59
5.17	Hazardous substances .....	60
5.18	Workshop, equipment maintenance and storage .....	67
5.19	Batching plants.....	70
5.20	Dust emissions .....	72
5.21	Blasting.....	76
5.22	Noise .....	76
5.23	Fire prevention .....	79
5.24	Stockpiling and stockpile areas.....	81
5.25	Finalising tower positions.....	81
5.26	Excavation and Installation of foundations .....	83
5.27	Assembly and erecting towers .....	86
5.28	Stringing .....	94
5.29	Socio-economic .....	99
5.30	Temporary closure of site .....	101
5.31	Landscaping and rehabilitation .....	104
6	ACCESS TO THE GENERIC EMPr .....	108
PART B: SECTION 2	.....	110
7	SITE SPECIFIC INFORMATION AND DECLARATION .....	110
7.1	Sub-section 1: contact details and description of the project .....	110
7.2	Sub-section 2: Development footprint site map .....	115
7.3	Sub-section 3: Declaration .....	115

7.4	Sub-section 4: amendments to site specific information (Part B; section 2) .....	116
PART C	.....	118
8	SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES .....	118
APPENDIX 1: METHOD STATEMENTS	.....	119

## **List of figures**

Figure 1: Example of an environmental sensitivity map in the context of a final overhead transmission and distribution profile .....	115
--------------------------------------------------------------------------------------------------------------------------------------	-----

## **List of tables**

Table 1: Guide to roles and responsibilities for implementation of an EMPr .....	8
----------------------------------------------------------------------------------	---



## **INTRODUCTION**

### **1. Background**

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended, (EIA Regulations) or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the competent authority (CA).

### **2. Purpose**

This document constitutes a generic EMPr relevant to applications for the development or expansion of overhead electricity transmission and distribution infrastructure, and all listed and specified activities necessary for the realisation of such infrastructure.

### **3. Objective**

The objective of this generic EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.

### **4. Scope**

The scope of this generic EMPr applies to the development or expansion of overhead electricity transmission and distribution infrastructure requiring EA in terms of NEMA, i.e. with a capacity of 33 kilovolts or more. This generic EMPr applies to activities requiring EA, mainly activity 11 and 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended, and all associated listed or specified activities necessary for the realisation of such infrastructure.

## 5. Structure of this document

This document is structured in three parts with an Appendix as indicated in the table below:

Part	Section	Heading	Content
A		Provides general guidance and information and is <b>not legally binding</b>	Definitions, acronyms, roles & responsibilities and documentation and reporting.
B	1	Pre-approved generic EMPr template	<p>Contains generally accepted impact management outcomes and impact management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure, which are presented in the form of a template that has been pre-approved.</p> <p>The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity.</p> <p>Where an impact management outcome is not relevant, the words “not applicable” can be inserted in the template under the “responsible persons” column.</p> <p>Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template <b>is not required</b> to be submitted to the CA as once the generic EMPr is gazetted for implementation, it has been approved by the CA.</p> <p>To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant /proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website.</p>
	2	Site specific information	Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved generic EMPr

Part	Section	Heading	Content
			<p>template contained in <u>Part B: Section 1</u>, and understands that the impact management outcomes and impact management actions are <b>legally binding</b>. The preliminary infrastructure layout must be finalized to inform the final EMPr that is to be submitted with the basic assessment report (BAR) or environmental impact assessment report (EIAR), ensuring that all impact management outcomes and actions have been either pre-approved or approved in terms of <u>Part C</u>.</p> <p>This section <b>must be</b> submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of <u>Part B: section 2</u> not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.</p>
C		Site specific sensitivities/ attributes	<p>If any specific environmental sensitivities/ attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (<u>Part B: section 1</u>)</p> <p>This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if <u>Part C</u> is applicable to the site, it <b>is required</b> to be submitted together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP, and must contain his/her name and expertise including a curriculum vitae. Once approved, Part C forms part of the EMPr for the site and is legally binding.</p>

Part	Section	Heading	Content
			This section applies only <b>to additional</b> impact management outcomes and impact management actions that are necessary for the avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not already included in <u>Part B: section 1</u> .
	Appendix 1		Contains the method statements to be prepared prior to commencement of the activity. The method statements are <b>not required</b> to be submitted to the competent authority.

## 6. Completion of part B: section 1: the pre-approved generic EMP template

The template is to be completed prior to commencement of the activity, by providing the following information for each environmental impact management action:

- For implementation
  - a 'responsible person',
  - a method for implementation,
  - a timeframe for implementation
- For monitoring
  - a responsible person
  - frequency
  - evidence of compliance.

The completed template must be signed and dated by the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must be signed and dated on each page by the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

## 7. Amendments of the impact management outcomes and impact management actions

Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

- Amendment of the impact management outcomes: in line with the process contemplated in regulation 37 of the EIA Regulations; and
- Amendment of the impact management actions: in line with the process contemplated in regulation 36 of the EIA Regulations.

## **8. Documents to be submitted as part of part B: section 2 site specific information and declaration**

Part B: Section 2 has three distinct sub-sections. The first and third sub-sections are in a template format. Sub-section two requires a map to be produced.

Sub-section 1 contains the project name, the applicant's name and contact details, the site information, which includes coordinates of the corridor in which the proposed overhead electricity transmission and distribution infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and, where available, the farm name.

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. raptor nest, threatened plant species, archaeological site, etc. Sensitivity maps must identify features both within the planned working area and any known sensitive features in the surrounding landscape within 50m from the development footprint. The overhead transmission and distribution profile must be illustrated at an appropriate resolution to enable fine scale interrogation. It is recommended that <20 km of overhead transmission and distribution length is illustrated per page in A3 landscape format. Where considered appropriate, photographs of sensitive features in the context of tower positions must be used.

Sub-section 3 is the declaration that the applicant/proponent or holder of the EA in the case of a change of ownership must complete, which confirms that the applicant/EA holder will comply with the pre-approved generic EMPr template in Section 1 and understands that the impact management outcomes and actions are legally binding.

### **(a) Amendments to Part B: Section 2 – site specific information and declaration**

Should the EA be transferred, Part B: Section 2 must be completed by the new applicant/proponent and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted as part of such an application for an amendment to an EA will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

## PART A – GENERAL INFORMATION

### 1. DEFINITIONS

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

**"clearing"** means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

**"construction camp"** is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;

**"contractor"** - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

**"hazardous substance"** is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

**"method statement"** means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover applicable details with regard to:

- (i) Construction procedures;
- (ii) Plant, materials and equipment to be used;
- (iii) Transporting the equipment to and from site;
- (iv) How the plant/ material/ equipment will be moved while on site;
- (v) How and where the plant/ material/ equipment will be stored;
- (vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- (vii) Timing and location of activities;
- (viii) Compliance/ non-compliance; and
- (ix) Any other information deemed necessary by the Project Manager.

**"slope"** means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

**“solid waste”** means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

**“spoil”** means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

**“topsoil”** means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil; and

**“works”** means the works to be executed in terms of the Contract

## 2. ACRONYMS and ABBREVIATIONS

<b>CA</b>	Competent Authority
<b>cEO</b>	Contractors Environmental Officer
<b>dEO</b>	Developer Environmental Officer
<b>DPM</b>	Developer Project Manager
<b>DSS</b>	Developer Site Supervisor
<b>EAR</b>	Environmental Audit Report
<b>ECA</b>	Environmental Conservation Act No. 73 of 1989
<b>ECO</b>	Environmental Control Officer
<b>EA</b>	Environmental Authorisation
<b>EIA</b>	Environmental Impact Assessment
<b>ERAP</b>	Emergency Response Action Plan
<b>EMPr</b>	Environmental Management Programme Report
<b>EAP</b>	Environmental Assessment Practitioner
<b>FPA</b>	Fire Protection Agency
<b>HCS</b>	Hazardous chemical Substance
<b>NEMA</b>	National Environmental Management Act, 1998 (Act No. 107 of 1998)
<b>NEMBA</b>	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
<b>NEMWA</b>	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
<b>MSDS</b>	Material Safety Data Sheet
<b>RI&amp;AP's</b>	Registered interested and affected parties

### 3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken.

**Table 1:** *Guide to roles and responsibilities for implementation of an EMPr*

Responsible Person (s)	Role and Responsibilities
Developer's Project Manager (DPM)	<p><u>Role</u></p> <p>The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"><li>- Be fully conversant with the conditions of the EA;</li><li>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s);</li><li>- Issuing of site instructions to the Contractor for corrective actions required;</li><li>- Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and</li><li>- Ensure that periodic environmental performance audits are undertaken on the project implementation.</li></ul>
Developer Site Supervisor (DSS)	<p><u>Role</u></p> <p>The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS</p>



Responsible Person (s)	Role and Responsibilities
	<p>is responsible for the day to day implementation of the EMP and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMP.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Ensure that all contractors identify a contractor's Environmental Officer (cEO);</li> <li>- Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO;</li> <li>- Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO;</li> <li>- Issuing of site instructions to the Contractor for corrective actions required;</li> <li>- Will issue all non-compliances to contractors; and</li> <li>- Ratify the Monthly Environmental Report.</li> </ul>
Environmental Control Officer (ECO)	<p><u>Role</u></p> <p>The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMP.</p> <p>The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &amp; Affected Parties' (RI&amp;AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.</p> <p><u>Responsibilities</u></p>

Responsible Person (s)	Role and Responsibilities
	<p>The responsibilities of the ECO will include the following:</p> <ul style="list-style-type: none"> <li>- Be aware of the findings and conclusions of all EA related to the development;</li> <li>- Be familiar with the recommendations and mitigation measures of this EMPr;</li> <li>- Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them;</li> <li>- Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required;</li> <li>- Educate the construction team about the management measures contained in the EMPr and environmental licenses;</li> <li>- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective;</li> <li>- Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements;</li> <li>- In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses;</li> <li>- Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns;</li> <li>- Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr;</li> <li>- Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO);</li> <li>- Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc) as well as corrective and preventive actions taken;</li> <li>- Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken;</li> <li>- Assisting in the resolution of conflicts;</li> <li>- Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor;</li> <li>- In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance;</li> <li>- Maintenance, update and review of the EMPr;</li> <li>- Communication of all modifications to the EMPr to the relevant stakeholders.</li> </ul>
developer Environmental Officer	<u>Role</u>

Responsible Person (s)	Role and Responsibilities
(dEO)	<p>The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be fully conversant with the EMPr;</li> <li>- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures;</li> <li>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ;</li> <li>- Confine the development site to the demarcated area;</li> <li>- Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO);</li> <li>- Assist the contractors in addressing environmental challenges on site;</li> <li>- Assist in incident management;</li> <li>- Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared;</li> <li>- Assist the contractor in investigating environmental incidents and compile investigation reports;</li> <li>- Follow-up on pre-warnings, defects, non-conformance reports;</li> <li>- Measure and communicate environmental performance to the Contractor;</li> <li>- Conduct environmental awareness training on site together with ECO and cEO;</li> <li>- Ensure that the necessary legal permits and / or licenses are in place and up to date;</li> <li>- Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;</li> </ul>
Contractor	<p><u>Role</u></p> <p>The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where</p>

Responsible Person (s)	Role and Responsibilities
	<p>specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion for overhead electricity transmission and distribution infrastructure activities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- project delivery and quality control for the development services as per appointment;</li> <li>- employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period;</li> <li>- ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely;</li> <li>- attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones;</li> <li>- ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.</li> </ul>
contractor Environmental Officer (cEO)	<p><u>Role</u></p> <p>Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be on site throughout the duration of the project and be dedicated to the project;</li> <li>- Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;</li> <li>- Implementing the environmental conditions, guidelines and requirements as stipulated within the EA,</li> </ul>

Responsible Person (s)	Role and Responsibilities
	<p>EMPr and Method Statements;</p> <ul style="list-style-type: none"> <li>- Attend the Environmental Site Meeting;</li> <li>- Undertaking corrective actions where non-compliances are registered within the stipulated timeframes;</li> <li>- Report back formally on the completion of corrective actions;</li> <li>- Assist the ECO in maintaining all the site documentation;</li> <li>- Prepare the site inspection reports and corrective action reports for submission to the ECO;</li> <li>- Assist the ECO with the preparing of the monthly report; and</li> <li>- Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.</li> </ul>

#### **4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE**

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all overhead electricity transmission and distribution infrastructure projects as a minimum requirement.

##### **4.1 Document control/Filing system**

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. At a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

##### **4.2 Documentation to be available**

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

##### **4.3 Weekly Environmental Checklist**

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

#### 4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

#### 4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substance's;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor shall be captured in Appendix 1.

#### 4.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

#### 4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints



received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions , as approved in generic and site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

#### 4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

#### 4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;
12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

#### 4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in **(section 4.11)** below.

#### 4.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in **(section 4.10)** above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

#### 4.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

#### 4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes must be included in the EMPr file and be submitted to the CA at intervals as indicated in the EA.

An Environmental Audit Report must be prepared monthly. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

#### 4.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

## **PART B: SECTION 1: Pre-approved generic EMPr template**

### **5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS**

This section provides a pre-approved generic EMPr template with aspects that are common to the development of overhead electricity transmission and distribution infrastructure. There is a list of aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

### 5.1 Environmental awareness training

**Impact management outcome:** All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All staff must receive environmental awareness training prior to commencement of the activities;	cEO	Environmental awareness training and attendance registers	Pre and during construction	ECO	Monthly	Training material and attendance register available on-site.
– The Contractor must allow for sufficient sessions to train all personnel	cEO	Training schedule and attendance registers	Pre and during construction	ECO	Monthly	Attendance registers available on-site.
– with no more than 20 personnel attending each course;	cEO	Training schedule and attendance registers	Pre and during construction	ECO	Monthly	Attendance registers available on-site.
– Refresher environmental awareness training is available as and when required;	cEO	Environmental awareness training and attendance registers. Toolbox talks.	Pre and during construction	ECO	Monthly	Training material and attendance register available on-site.
– All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual	cEO	Environmental awareness	Pre and during construction	ECO	Monthly	Training material

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
roles and responsibilities in achieving compliance with the EA and EMPr;		training and attendance registers.				and attendance register available on-site.
<ul style="list-style-type: none"> <li>The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum:               <ul style="list-style-type: none"> <li>a) Safety notifications; and</li> <li>b) No littering.</li> </ul> </li> </ul>	cEO	Information posters must be erected on-site.	Pre and during construction	ECO	Monthly	Information posters erected on-site.
<ul style="list-style-type: none"> <li>Environmental awareness training must include as a minimum the following:               <ul style="list-style-type: none"> <li>a) Description of significant environmental impacts, actual or potential, related to their work activities;</li> <li>b) Mitigation measures to be implemented when carrying out specific activities;</li> <li>c) Emergency preparedness and response procedures;</li> <li>d) Emergency procedures;</li> <li>e) Procedures to be followed when working near or within sensitive areas;</li> <li>f) Wastewater management procedures;</li> <li>g) Water usage and conservation;</li> <li>h) Solid waste management procedures;</li> <li>i) Sanitation procedures;</li> <li>j) Fire prevention; and</li> <li>k) Disease prevention.</li> </ul> </li> </ul>	cEO	Environmental awareness training material and attendance registers	Pre and during construction	ECO	Monthly	Training material and attendance register available on-site.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Educate workers on the dangers of open and/or unattended fires;	cEO					
– Course material must be available and presented in appropriate languages that all staff can understand.	cEO					
– A record of all environmental awareness training courses undertaken as part of the EMP must be available;	cEO					
– A staff attendance register of all staff to have received environmental awareness training must be available.	cEO					

## 5.2 Site Establishment development

**Impact management outcome:** Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the	Contractor	Approved method	Pre-construction	ECO	Once-off	Approved methods

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;		statements				statements available.
– Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through;	cEO	Approved campsite plan available.	Pre-construction	ECO	Once-off	Camp site located as per the approved plan.
– Sites must be located where possible on previously disturbed areas;	cEO	Approved campsite plan available.	Pre-construction	ECO	Once-off	Camp site located as per the approved plan.
– The camp must be fenced in accordance with <b>Section 5.5: Fencing and gate installation</b> ; and	cEO	Fenced and gated campsite.	Pre-construction	ECO	Once-off	Camp site is fenced and gated.
– The use of existing accommodation for contractor staff, where possible, is encouraged.	cEO	No workers housed in the camp site	During construction	ECO	Monthly	No workers are housed in the camp site.



### 5.3 Access restricted areas

**Impact management outcome:** Access to restricted areas prevented.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development;	cEO dEO	Site walkthrough reports.	Pre construction	ECO	Once-off	site walk through reports available.
– Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and	Contractor	Red or red and white barriers to be used around restricted areas.	During construction	ECO	Monthly	Restricted areas are barricaded.
– Unauthorised access and development related activity inside access restricted areas is prohibited.	cEO	Environmental awareness training material and attendance registers.	Pre and during construction	ECO	Monthly	Training material and attendance register available on-site.

### 5.4 Access roads

**Impact management outcome:** Minimise impact to the environment through the planned and restricted movement of vehicles on site.

Impact Management Actions	Implementation	Monitoring
---------------------------	----------------	------------

	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area;</li> </ul>	Developer	Access agreements available.	Pre and during construction	ECO dEO	Monthly	Access agreements terms are complied with.  No complaints from landowners.
<ul style="list-style-type: none"> <li>– An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities;</li> </ul>						
<ul style="list-style-type: none"> <li>– The access roads to tower positions must be signposted after access has been negotiated and before the commencement of the activities;</li> </ul>	Contractor	Access agreements available.  Sign post erected.	Pre and during construction	ECO	Monthly	Sign post erected.
<ul style="list-style-type: none"> <li>– All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition</li> </ul>	Contractor	Rehabilitation plan approved.	Post-construction.	ECO External auditor	Monthly  Biannually	Roads and servitudes rehabilitated to original or better position.
<ul style="list-style-type: none"> <li>– All contractors must be made aware of all these access routes.</li> </ul>	cEO	Awareness training.	During construction.	ECO	Monthly	Contractors use the correct access routes.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense;	Contractor	Deviation agreement with landowners.	During construction.	ECO	Monthly	Deviation agreement in place.
– Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads;	Contractor	Route planning maximized the use of both existing servitudes and existing roads.	During construction.	cEO ECO	Daily Monthly	Contractors use the correct access routes.
– In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with <b>section 4.9: photographic record</b> ; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor;	cEO	Access agreements available.  Pre-construction site profile	Pre and during construction	ECO dEO	Monthly	Access agreements terms are complied with.  Pre-construction photos available.
– Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands	Contractor	Access roads follow fences where possible.	Pre and during construction	cEO ECO	Weekly Monthly	Fragmentation of vegetated areas or croplands is minimized.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Access roads must only be developed on pre-planned and approved roads.</li> </ul>	Contractor	Access roads follow the approved route.	Pre and during construction	cEO ECO	Weekly Monthly	Fragmentation of vegetated areas or croplands is minimized.

### 5.5 Fencing and Gate installation

**Impact management outcome:** Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Use existing gates provided to gain access to all parts of the area authorised for development, where possible;</li> </ul>	cEO	Awareness training.	During construction.	ECO	Monthly	Contractors use the correct access gates.
<ul style="list-style-type: none"> <li>Existing and new gates to be recorded and documented in accordance with <b>section 4.9: photographic record</b>;</li> </ul>	cEO	Awareness training.	During construction.	ECO	Monthly	Contractors use the

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
		Records of access gates				correct access routes.  Photographic records of access gates available.
<ul style="list-style-type: none"> <li>All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner;</li> </ul>	cEO	Awareness training.  Gates must be fitted with locks.	During construction.	cEO ECO	Weekly Monthly	Photographic records of access gates available.  Gates are locked.
<ul style="list-style-type: none"> <li>At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner;</li> </ul>	cEO	Access agreements available.  Gates installed as per the approved terms.	Pre and during construction	ECO	Monthly	Access agreements terms are complied with.
<ul style="list-style-type: none"> <li>Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom</li> </ul>	Contractor	Photographic record of gates	Pre and during construction	ECO	Monthly	There are no gaps of

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
of the gate and the ground;						more than 100 mm between the bottom of the gate and the ground.
– Where gates are installed in jackal proof fencing, a suitable reinforced concrete still must be provided beneath the gate;	Contractor	Photographic record of gates	Pre and during construction	ECO	Monthly	Jackal-proof fencing used where applicable.
– Original tension must be maintained in the fence wires;	Contractor	Photographic record of gates	Pre and during construction	ECO	Monthly	Original status of the fence is maintained.  No complaints from the landowner.
– All gates installed in electrified fencing must be re-electrified;	Contractor	Photographic record of gates	Pre and during construction	ECO	Monthly	Original status of the fence is maintained.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						No complaints from the landowner.
– All demarcation fencing and barriers must be maintained in good working order for the duration of overhead transmission and distribution electricity infrastructure development activities;	Contractor	Photographic record of gates	During and post-construction	ECO	Monthly	No complaints from the landowner.
– Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where appropriate and would not cause harm to the sensitive flora;	Contractor	Method statement approved.	During construction	ECO	Monthly	Fence erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas.
– Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner.	cEO	Access agreements available.	During construction	ECO	Monthly	Access agreements terms are

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
		Gates installed as per the approved terms.				complied with.
– All fencing must be developed of high-quality material bearing the SABS mark;	Contractor	Photographic record of fencing.  Method statement approved.	During and post-construction	ECO	Monthly	Photographic record of fence.  No complaints from the landowner.
– The use of razor wire as fencing must be avoided;	cEO	No razor wire allowed on-site.	During and post-construction	ECO	Monthly	No razor wire used.
– Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times;	cEO	Awareness training.  Gates must be locked after hours.  Security personnel appointed to safeguards the sites.	During construction.	ECO	Monthly	Photographic records of locked gates.
– On completion of the development phase all temporary	<b>Contractor</b>	Photographic	During and post-	ECO	Once-off	Photographi



Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
fences are to be removed; – The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.		records.  Rehabilitation Plan approved.	construction			c record of fence.  Rehabilitation Plan implemented.  No fence cut-off left on-site.  No complaints from the landowner.

## 5.6 Water Supply Management

<b>Impact management outcome:</b> Undertake responsible water usage.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that	Developer	Water-use licenses or	Pre-drilling of boreholes or	ECO	Monthly	Water-use licenses or

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
the abstracted volumes are measured on a daily basis;		registration document available.	taking of water from a water resource.			registration document available on-site.  Records of abstraction kept on-site.
<ul style="list-style-type: none"> <li>The Contractor must ensure the following:               <ul style="list-style-type: none"> <li>a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river;</li> <li>b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and</li> <li>c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented.</li> </ul> </li> </ul>	cEO	Training manual and proof of induction.	During construction	cEO ECO	Weekly Monthly	No visible damage to the river bed or banks, and no stream diversion as the result of water abstraction activities.
<ul style="list-style-type: none"> <li>Ensure water conservation is being practiced by:               <ul style="list-style-type: none"> <li>a. Minimising water use during cleaning of equipment;</li> <li>b. Undertaking regular audits of water systems; and</li> <li>c. Including a discussion on water usage and conservation during environmental awareness training.</li> <li>d. The use of grey water is encouraged.</li> </ul> </li> </ul>	cEO	Training manual and proof of induction.	During construction	cEO ECO	Weekly Monthly	Water is being re-used.  Audit reports available

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						on-site.  Water-saving information pamphlets placed on-site.

#### 5.7 Storm and waste water management

**Impact management outcome:** Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager;</li> </ul>	cEO	If a spill occurs on an impermeable surface such as cement or concrete, the surface spill shall be contained.	During construction	cEO	Daily	Photographic evidence of spillage containment.
<ul style="list-style-type: none"> <li>All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility;</li> </ul>				ECO	Monthly	

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO;</li> </ul>	cEO	Separation of contaminated water and clean runoff implemented.	During construction	ECO	Monthly	<p>No contaminated water allowed to be discharged into a watercourse.</p> <p>No complaints from I&amp;APs</p>
<ul style="list-style-type: none"> <li>Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.</li> </ul>	Contractor	Settlement ponds approved and developed where applicable.	During construction.	ECO	Monthly	<p>No contaminated water allowed to be discharged into a watercourse.</p> <p>No complaints from I&amp;APs</p>

## 5.8 Solid and hazardous waste management

**Impact management outcome:** Waste is appropriately stored, handled and safely disposed of at a recognised waste facility.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All measures regarding waste management must be undertaken using an integrated waste management approach;</li> <li>– Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided;</li> </ul>	Contractor	Waste Management Plan must be developed and implemented.	Pre-construction  During construction	cEO	Monthly	Waste separation on-site.  Waste disposal manifesto available on-site.
<ul style="list-style-type: none"> <li>– A suitably positioned and clearly demarcated waste collection site must be identified and provided;</li> </ul>	Contractor	There must be clearly demarcated waste collection area on-site.	During construction	cEO ECO	Monthly	There is a clearly demarcated waste collection area on-site.
<ul style="list-style-type: none"> <li>– The waste collection site must be maintained in a clean and orderly manner;</li> </ul>	Contractor	Waste is deposited inside	During construction	cEO	Daily	No litter on-site.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
	cEO	waste bins				
– Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal;	cEO	Clearly marked separation bins must be provided.	During construction	cEO CEO	Daily Monthly	Waste is segregated.  Waste manifesto available on-site.
– Staff must be trained in waste segregation;	cEO	Training manual	Pre and during construction	ECO	Monthly	Training manual kept on-site.  Training attendance register available on-site.
– Bins must be emptied regularly;	Contractor	Waste collection schedule must be implemented.	During construction	cEO ECO	Weekly Monthly	No over-flowing bins on-site.  No piled waste on-site.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company	Contractor	Waste disposal manifesto	During construction	cEO ECO	Weekly Monthly	Waste disposal site kept on-site.
– Hazardous waste must be disposed of at a registered waste disposal site;	Contractor	Waste disposal manifesto	During construction	cEO ECO	Weekly Monthly	Waste disposal site kept on-site.
– Certificates of safe disposal for general, hazardous and recycled waste must be maintained.	Contractor	Waste disposal manifesto	During construction	cEO ECO	Weekly Monthly	Waste disposal site kept on-site.

### 5.9 Protection of watercourses and estuaries

<b>Impact management outcome:</b> Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the	Contractor Engineer	Stormwater management plan.  Water	During and post construction	cEO ECO	Weekly Monthly	No contamination of watercourses

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Contractor's activities;		monitoring report.				es.  Water monitoring reports do not show increase of pollutants.
– In the event of a spill, prompt action must be taken to clear the polluted or affected areas;	Contractor	Emergency Preparedness Plan in place and implemented.  Spill kits available on-site.	During construction.	cEO ECO	Weekly Monthly	Clean-up kits available on-site.  Emergency report (where applicable) available on-site)
– Where possible, no development equipment must traverse any seasonal or permanent wetland	Contractor	Site plan with wetland demarcations where applicable.	Pre, during and post-construction.	cEO ECO	Once-off	WUL available where wetlands are



Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						affected.
– No return flow into the estuaries must be allowed and no disturbance of the Estuarine Functional Zone should occur;	N/A	N/A	N/A	N/A	N/A	N/A
– Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available;	Developer Contractor	Approved line and tower positions.	Pre and during construction	cEO ECO	Weekly Monthly	Towers are located on approved positions.  No watercourses are affected.
– There must not be any impact on the long-term morphological dynamics of watercourses or estuaries;	Developer	Rehabilitation plan is approved and implemented.	During and post-construction.	cEO ECO	Monthly	Watercourses are rehabilitated post-construction.
– Existing crossing points must be favored over the creation of new crossings (including temporary access).	Developer	Approved line and tower positions.	Pre and during construction	cEO ECO	Weekly Monthly	Towers are located on approved positions.
– When working in or near any watercourse or estuary, the	<b>Contractor</b>	Approved line	Pre and during	cEO	Weekly	Towers are

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>following environmental controls and consideration must be taken:</p> <p>a) Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse</p> <p>b) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained;</p> <p>c) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and</p> <p>d) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.</p>		and tower positions.	construction	ECO	Monthly	<p>located on approved positions.</p> <p>No watercourses are affected.</p> <p>The site is rehabilitated and re-vegetated.</p>

#### 5.10 Vegetation clearing

**Impact management outcome:** Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<b>General:</b> <ul style="list-style-type: none"> <li>Indigenous vegetation which does not interfere with the development must be left undisturbed;</li> </ul>	Contractor	Campsites and towers are positioned in disturbed areas where possible.	Pre-construction.	Contractor coed ECO	Monthly	No clearance of indigenous vegetation without approval of ECO.
<ul style="list-style-type: none"> <li>Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species;</li> </ul>	cEO	Identify and demarcate protected species.  Permit available to remove protected plants, where applicable.	Pre, during and post-construction	cEO ECO	Daily Monthly	Removal permit kept on-site where applicable.  Record of removed protected vegetation, where applicable.
<ul style="list-style-type: none"> <li>Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing;</li> </ul>	Developer	Record of identified protected plants available.	Pre-construction	ECO	Once-off	Record of identified protected plants kept

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						on-site.  Floral walkthroug h report kept on-site.
– Permits for removal must be obtained from the Department of Agriculture, Forestry and Fisheries prior to the cutting or clearing of the affected species, and they must be filed;	Developer	Permits available and implemented.	Pre-construction.	ECO	Monthly	Permits kept on-site.
– Trees felled due to construction must be documented and form part of the Environmental Audit Report;	Contractor cEO	Record of tree cut to be developed	Pre, during and post-construction	cEO ECO	Weekly Monthly	Record of felled trees kept on-site.
– The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals;	ECO	Record of identified trees and rescue thereof.	During construction	ECO	Monthly	Written and photograph ic record of relocated plants.
– Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris;	cEO	Photographic records	During and post-construction	ECO	Monthly	No debris along watercours es adjacent to the site.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained;	cEO	Method statement developed and approved	During and post-construction.	ECO	Monthly	Records of application of herbicides as per the method statement kept on-site.
– A daily register must be kept of all relevant details of herbicide usage;	cEO	Keep records of herbicides.	During and post-construction.	ECO	Monthly	Records of application of herbicides kept on-site.
– No herbicides must be used in estuaries;	cEO	No estuaries on-site.	No estuaries on-site.	No estuaries on-site.	No estuaries on-site.	No estuaries on-site.
– All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to <b>Section 5.3: Access restricted areas</b> .	coed ECO	Mark and protect identified protected species.	During construction	ECO	Monthly	Identified protected species have protection around them.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<b>Servitude:</b> <ul style="list-style-type: none"> <li>Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager;</li> </ul>	Developer  Project Manager	Grass cutting method statement	During and post-construction.	ECO	Monthly	Visual observation of vegetation transmission line.
<ul style="list-style-type: none"> <li>Where clearing for access purposes is essential, the maximum width to be cleared within the servitude must be in accordance to distance as agreed between the land owner and the EA holder</li> </ul>	Developer	Grass cutting method statement	Post-construction	Developer EO	Biannually	Vegetation cut according to the method statement.  No tall vegetation under the line and inside the servitude.
<ul style="list-style-type: none"> <li>Vegetation must be trimmed where it is likely to intrude on the minimum vegetation clearance distance (MVCD) or will intrude on this distance before the next scheduled clearance. MVCD is determined from SANS 10280;</li> </ul>	Developer	Grass cutting method statement must comply with SANS 10280	Post-construction	ECO  External auditor	Monthly  Biannually	Vegetation cut according to the method

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance statement.
<ul style="list-style-type: none"> <li>– Alien invasive vegetation must be removed according to a plan (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a recognised waste disposal facility;</li> </ul>	cEO during construction . Developer post-construction	Alien and invasive species eradication programme must be in place.	cEO Developer EO	ECO External auditor	Monthly Biannually	Vegetation cut according to the Alien and invasive species eradication programme
<ul style="list-style-type: none"> <li>– Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility, unless the landowners wish to retain the cut vegetation;</li> </ul>	cEO during construction . Developer post-construction	Waste disposal manifesto	cEO Developer EO	ECO External auditor	Monthly Biannually	Waste disposal slips kept by the Developer and coed.
<ul style="list-style-type: none"> <li>– In the case of the development of new overhead transmission and distribution infrastructures, a one metre "trace-line" must be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along the "trace-line". Alternative methods of stringing which limit impact to the environment must always be considered.</li> </ul>	Contractor	Grass cutting method statement	Post-construction	ECO	Monthly	Vegetation cut according to the method statement.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						One metre trace line maintained for stringing.

#### 5.11 Protection of fauna

<b>Impact management outcome:</b> Minimise disturbance to fauna.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present;	Project Manager	Private property access agreements in place.	During and post-construction.	ECO	Monthly	Access agreements clauses are complied with.  No complaints from property owners.



Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The breeding sites of raptors and other wild birds' species must be taken into consideration during the planning of the development programme;	Project Manager	Avifaunal walkthrough results must be available and mitigations adhered to.	During construction.	ECO cEO	Monthly Daily	No interference with the breeding sites of raptors and other wild birds.
– Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present;	Project Manager	Avifaunal walkthrough results must be available and mitigations adhered to.	During construction.	ECO cEO	Monthly Daily	No interference with the breeding sites of raptors and other wild birds.
– Nesting sites on existing parallel lines must documented;	Project Manager  Avifauna Specialist	Nesting sites database	N/A	N/A	N/A	N/A
– Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;	cEO	Avifaunal specialist report walkthrough	During construction.	ECO cEO	Monthly Daily	No disturbance of raptors

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
		results must be available and mitigations adhered to.				and other wild birds.
– Bird guards and diverters must be installed on the new line as per the recommendations of the specialist;	Contractor Developer	Diverter installation schedule	During construction.	ECO cEO	Monthly	Diverter installed at identified pillars (see Annexure 1)
– No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas;	cEO Contractor	Training Manual/ Induction Manual	Pre and during construction	ECO	Monthly	Proof of training available on-site.  No complaints from other stakeholder.
– No deliberate or intentional killing of fauna is allowed;	cEO Contractor	Training Manual/ Induction Manual	Pre and during construction	ECO	Monthly	Proof of training available on-site.  No

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						complaints from other stakeholder.
<ul style="list-style-type: none"> <li>– In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and</li> </ul>	cEO	Snake deterrents deployed in areas where there is abundance of snakes.	Pre and during construction.	ECO	Monthly	Snake deterrents deployed in areas where there is abundance of snakes.
<ul style="list-style-type: none"> <li>– No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.</li> </ul>	dEO	Permits for removal of protected species acquired.  Faunal Management Plan.	Pre and during construction.	ECO	Monthly	Proof of training available on-site.  Permits available on-site.  List of protected species that are likely to be found

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						on-site available.

#### 5.12 Protection of heritage resources

**Impact management outcome:** Minimise impact to heritage resources.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in <b>Section 5.3: Access restricted areas</b>;</li> </ul>	dEO cEO ECO	Implementation of Heritage Management Plan	During and post-construction.	ECO	Monthly	Sensitive heritage resources identified in Annexure 2 are demarcated.
<ul style="list-style-type: none"> <li>Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance;</li> </ul>	cEO	Implementation of Heritage Management	During construction	ECO	Monthly	Monitoring report

		Plan				available.
<ul style="list-style-type: none"> <li>All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.</li> </ul>	<b>cEO</b>	Implementation of Heritage Management Plan	During construction	ECO	Monthly	Heritage Investigation Report, where applicable, should be kept on-site.

### 5.13 Safety of the public

**Impact management outcome:** All precautions are taken to minimise the risk of injury, harm or complaints.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.;</li> </ul>	cEO	ERAP available and implemented.  Restricted areas demarcated.  Emergency numbers displayed on-site.	During construction	ECO	Monthly	ERAP kept on-site.  Restricted areas demarcated.  Emergency numbers displayed on-site.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						Incident reports available.
– All unattended open excavations must be adequately fenced or demarcated;	cEO	Excavations must be fenced off.	During construction	ECO	Monthly	Excavations are fenced off.
– Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; – Ensure structures vulnerable to high winds are secured;	cEO	Strict access control must be implemented.	During construction	ECO	Monthly	Strict access control in place.
– Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.	cEO	Incidents and complaints register must be kept.	During construction	ECO	Monthly	Incidents and complaints register kept on-site.

#### 5.14 Sanitation

<b>Impact management outcome:</b> Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.		
Impact Management Actions	Implementation	Monitoring

	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Mobile chemical toilets are installed onsite if no other ablution facilities are available;	Contractor	Site establishment checklist	During construction	cEO ECO	Daily Monthly	Mobile chemical toilets are installed.
– The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances;	cEO	Training/ Induction Manual	During construction	cEO ECO	Daily Monthly	Mobile chemical toilets are used.  no indiscriminate use of the veld for the purposes of ablutions.
– Where mobile chemical toilets are required, the following must be ensured: a) Toilets are located no closer than 100 m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMP; d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to	cEO	Camp site layout plan is approved and implemented.	During construction.	ECO	Monthly	Site established according to the approved layout plan.

prevent toilet paper from being blown out; e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards;						
– A copy of the waste disposal certificates must be maintained.	cEO	Keep waste disposal certificates on-site.	During construction.	ECO	Monthly	Waste disposal certificates kept on-site.

### 5.15 Prevention of disease

**Impact Management outcome:** All necessary precautions linked to the spread of disease are taken.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Undertake environmentally-friendly pest control in the camp area;	cEO	Pest control method statement.	During construction.	ECO	Monthly.	Pesticide application record kept on-site.  List of herbicides used available.



Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS;	cEO	Training/ Induction Manual  Information pamphlets  Toolbox Talks	During construction	cEO ECO	Weekly Monthly	Proof of attendance of training and toolbox talks.  Training manual and pamphlets kept on-site.
– The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area;	cEO	Information posters displayed on-site.	During construction	cEO ECO	Weekly Monthly	Information posters are displayed on-site.
– Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable;	cEO	Information posters displayed on-site.	During construction	cEO ECO	Weekly Monthly	Information posters are displayed on-site.
– Free condoms must be made available to all staff on site at central points;	cEO	Place condoms in toilets.	During construction	cEO ECO	Daily Monthly	Condoms are replenished every

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						Monday.
– Medical support must be made available;	Contractor	<p>Medical emergency numbers should be displayed on-site.</p> <p>First-Aider should be on-site fulltime.</p> <p>Workers should have valid medical fitness certificates.</p>	During construction	ECO	Monthly	<p>Medical emergency numbers are on-site.</p> <p>First-Aider is on-site fulltime.</p> <p>Workers have valid medical fitness certificates.</p>
– Provide access to Voluntary HIV Testing and Counselling Services.	Contractor	Voluntary HIV Testing and Counselling Services should form part of medical fitness testing at the cost of the Contractor.	During construction	ECO	Monthly	Proof that workers are aware of voluntary HIV Testing and Counselling support.

### 5.16 Emergency procedures

**Impact management outcome:** Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project;	Contractor	Documentation	Pre-construction	ECO	Once-off	ERAP approved and kept on-site
– The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation;	Contractor	Documentation	Pre-construction	ECO	Once-off	ERAP approved and kept on-site
– All staff must be made aware of emergency procedures as part of environmental awareness training;	cEO	Training manual	Pre and during construction	ECO	Monthly	Training manual and proof of training kept on-site.
– The relevant local authority must be made aware of a fire as soon as it starts;	coed	Fire brigade numbers should	During	ECO	Monthly	Fire brigade numbers

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
	Site Manager	be displayed on site board.	construction.			displayed on site.
<ul style="list-style-type: none"> <li>In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see <b>Hazardous Substances section 5.17</b>).</li> </ul>	cEO	Spill kits and method statement must be provided.	During construction.	ECO	Monthly	There are spill kits on-site and workers know how to use them.

#### 5.17 Hazardous substances

**Impact management outcome:** Safe storage, handling, use and disposal of hazardous substances.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible;</li> </ul>	cEO	Inventory of hazardous substances kept	During construction	ECO	Monthly	Inventory available

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
		on-site.  Inventory of alternative non-hazardous substances kept on-site.				on-site.
– All hazardous substances must be stored in suitable containers as defined in the Method Statement;	cEO	Method statement for storage of I hazardous substances kept on-site.	During construction	ECO	Monthly	Method statement for storage of I hazardous substances available on-site.
– Containers must be clearly marked to indicate contents, quantities and safety requirements;	cEO	Containers must be marked.	During construction	ECO	Monthly	Containers are marked
– All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers;	Contractor	Bund walls must be built for hazardous material storage.	During construction	ECO	Monthly	Bund wall with 110% the capacity of stored liquids provided to

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						storage
– Bunded areas to be suitably lined with a SABS approved liner;	Contractor	SANS approved bund walls liners used.	During construction	ECO	Monthly	SANS approved bund walls liners are used.
– An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis;	cEO	Inventory of hazardous substances kept on-site in alphabetical order.	During construction	ECO	Monthly	Inventory of hazardous substances is kept on-site in alphabetical order.
– All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS);	cEO	Inventory of hazardous and their MSDSs kept on-site.	During construction	ECO	Monthly	Inventory of hazardous and their MSDSs are kept on-site.
– All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; – Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate	cEO	Proof of training must be kept on-site.  Approved	During construction  During	ECO  ECO	Monthly  Monthly	Proof of training is kept on-site.  Approved

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
safety measures. Appropriate personal protective equipment must be made available; –		storage tanks must be used.	construction			storage tanks are used.
– The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowzers;						
– The tanks/ bowzers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowzers (110% statutory requirement plus an allowance for rainfall);	Contractor	Bund walls must be built for hazardous material storage.	During construction	ECO	Monthly	Bund wall with 110% the capacity of stored liquids provided to storage
– The floor of the bund must be sloped, draining to an oil separator;	Contractor	Bund walls must be built for hazardous material storage.	During construction	ECO	Monthly	Bund wall with 110% the capacity of stored liquids provided to storage
– Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover.	Contractor	Impermeable refueling area	During construction	ECO	Monthly	Impermeable refueling

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained;		provided.				area provided where needed.
<ul style="list-style-type: none"> <li>– All empty externally dirty drums must be stored on a drip tray or within a bunded area;</li> <li>–</li> </ul>	cEO	Visibly dirty empty drums must be stored on within a bunded area.	During construction	ECO	Monthly	Visibly dirty empty drums are stored on within a bunded area.
<ul style="list-style-type: none"> <li>– No unauthorised access into the hazardous substances storage areas must be permitted;</li> <li>–</li> </ul>	cEO	Warning signs erected around hazardous substances storage areas must.	During construction	ECO	Monthly	Warning signs are erected around hazardous substances storage areas must. Restricted access to the area implemented.



Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– No smoking must be allowed within the vicinity of the hazardous storage areas;</li> <li>–</li> </ul>	cEO	Signage must be erected.  Training of workers.	During construction	ECO	Monthly	Signage must be erected.  Workers use designated smoking areas.
<ul style="list-style-type: none"> <li>– Adequate fire-fighting equipment must be made available at all hazardous storage areas;</li> <li>–</li> </ul>	Contractor	Adequate firefighting equipment provided.	During construction	ECO	Monthly	Adequate firefighting equipment available on-site.
<ul style="list-style-type: none"> <li>– Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used;</li> </ul>	cEO	Drip trays are provided and used.	During construction	ECO	Monthly	mobile refueling units are equipped with drip trays.
<ul style="list-style-type: none"> <li>– An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times;</li> </ul>	Contractor	Spill kits are provided.	During construction	ECO	Monthly	There are spill kits on-site.
<ul style="list-style-type: none"> <li>– The responsible operator must have the required training to</li> </ul>	cEO	Proof of training	During	ECO	Monthly	Proof of

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
make use of the spill kit in emergency situations;		kept on-site.	construction			training is available on-site.
– An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken;	Contractor	Spill kits are provided at all sites with hazardous material.	During construction	ECO	Monthly	Spill kits are available at all sites with hazardous material.
– In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to <b>Section 5.7</b> for procedures concerning <b>storm and waste water management</b> and <b>5.8</b> for <b>solid and hazardous waste management</b> .	cEO	Spillages on site must be contained immediately.  Contaminated soil shall be either excavated or treated on-site.  Contaminated remediation	During construction	ECO	Monthly	Incident report and remediation reports available on-site.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
		materials shall be carefully removed from the area of the spill to prevent further release of petrochemicals to the environment and stored in adequate containers until appropriate disposal.				

#### 5.18 Workshop, equipment maintenance and storage

**Impact management outcome:** Soil, surface water and groundwater contamination is minimised.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area;</li> </ul>						
<ul style="list-style-type: none"> <li>During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts;</li> </ul>	cEO	EPRP available.  Trip trays available.  Fire brigade contact numbers displayed on-site.	During construction	ECO	Monthly	Proof of training available on-site.  EPRP available.  Trip trays available.  Fire brigade contact numbers displayed on-site.
<ul style="list-style-type: none"> <li>Leaking equipment must be repaired immediately or be removed from site to facilitate repair;</li> </ul>	cEO	Daily inspection of machinery and vehicles.	During construction	cEO ECO	Daily Monthly	Inspection list kept on-site.  No leaking equipment

						on-site.
– Workshop areas must be monitored for oil and fuel spills;	cEO	Daily diary. Daily inspections	During construction	cEO ECO	Daily Monthly	Inspection list kept on-site.  No leaking equipment on-site.
– Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available;	Contractor	Adequate number of spill kits as determined by ECO provided.	During construction	ECO	Monthly	Adequate number of spill kits provided.
– The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed;	Contractor	Site layout plan has impermeable bunded area for concrete-mixing.  Stormwater management Plan developed and implemented.	During construction	cEO ECO	Daily Monthly	Run-off and polluted water are not mixed.  Stormwater management Plan is implemented.
– Water drainage from the workshop must be contained and managed in accordance <b>Section 5.7: storm and waste water management.</b>						

### 5.19 Batching plants

**Impact management outcome:** Minimise spillages and contamination of soil, surface water and groundwater.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Concrete mixing must be carried out on an impermeable surface;</li> </ul>	cEO	Impermeable batching plant/ cement-mixing area provided and fitted in containment facility.	During construction	ECO	Monthly	Impermeable batching plant/ cement-mixing area provided.
<ul style="list-style-type: none"> <li>Batching plants areas must be fitted with a containment facility for the collection of cement laden water.</li> </ul>						
<ul style="list-style-type: none"> <li>Dirty water from the batching plant must be contained to prevent soil and groundwater contamination</li> </ul>						
<ul style="list-style-type: none"> <li>Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains;</li> </ul>	cEO	Cement bags must be stored in skips or bins marked as hazardous containments.	During construction	ECO	Monthly	Cement bags are stored in skips or bins marked as hazardous containments.
<ul style="list-style-type: none"> <li>A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;</li> </ul>	cEO	Washout facility must be provided.	During construction	ECO	Monthly	Washout facility provided.
<ul style="list-style-type: none"> <li>Hardened concrete from the washout facility or concrete</li> </ul>	cEO	Re-use	During	ECO	Monthly	No piling of

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
mixer can either be reused or disposed of at an appropriate licenced disposal facility;		hardened concrete where possible or dispose with rubble.	construction			hardened concrete on-site.
– Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site;	cEO	Cement bags must be stored in skips or bins marked as hazardous containments.	During construction	ECO	Monthly	Cement bags are stored in skips or bins marked as hazardous containments.
– Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to <b>Section 5.20: Dust emissions</b> )	cEO	Cement-contaminated sand and aggregates must be sprayed and kept damp.	During construction	ECO	Monthly	Cement-contaminated sand and aggregates are sprayed and kept damp.
– Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility;	cEO	Re-use excess material where possible or	During construction	ECO	Monthly	No piling of excess material on-

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
		dispose at a registered landfill site.				site.  Waste disposal slips kept on-site.
– Temporary fencing must be erected around batching plants in accordance with <b>Section 5.5: Fencing and gate installation.</b>	Contractor	Batching plant must be fenced off.	During construction	cEO ECO	Daily Monthly	Batching plant is fenced off.

## 5.20 Dust emissions

<b>Impact management outcome:</b> Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO;	Contractor cEO	Dust suppression method statement, approved and	During construction	cEO ECO	Daily Monthly	No excessive dust from construction



Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
		implemented.				activities.
<ul style="list-style-type: none"> <li>Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible;</li> </ul>	Contractor cEO	<p>Soil stripping done no more than a week before commencement of works.</p> <p>Site must be rehabilitated to the completion of ECO upon completion of works.</p>	During construction	ECO	Monthly	Site is rehabilitated to the completion of ECO upon completion of works.
<ul style="list-style-type: none"> <li>Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present;</li> </ul>	Contractor cEO	Training/ Induction of drivers	During construction	cEO ECO	Daily Monthly	<p>Training manual and attendance register available on-site.</p> <p>No erodible material gets transported</p>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						under high winds without cover.
– During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level;	ECO cEO	Instruction Register	During construction	ECO	Monthly	.
– Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind;	Contractor	Place soil stockpiles in areas less affected by wind.	During the Construction	cEO ECO	Daily Monthly	Soil stockpiles are protected from strong winds.
– Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO;	cEO ECO	Stockpiles should not be higher than 2metres	During construction	ECO	Monthly	Stockpiles are not higher than 2metres
– Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas;	Drivers	Training/ Induction of	During construction	cEO	Daily	Training manual and attendance

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
	cEO	drivers		ECO	Monthly	register available on-site.  No erodible material gets transported under high winds without cover.
– Straw stabilisation must be applied at a rate of one bale/10 m <sup>2</sup> and harrowed into the top 100 mm of top material, for all completed earthworks;	Contractor cEO	Straw stabilization application method statement approved by ECO	During rehabilitation	ECO	Once-off	Photographic records of application available
– For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.	Contractor cEO	Dust suppression schedule and equipment must be available on-site.	During construction	cEO ECO	Daily Once-off	No excessive dust observed on-site

### 5.21 Blasting

**Impact management outcome:** Impact to the environment is minimised through a safe blasting practice.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Any blasting activity must be conducted by a suitably licensed blasting contractor; and	Contractor cEO	Proof of credentials of the blasting supervisor must be available	During construction	ECO	Monthly	Suitably qualified blasting supervisor carries out blasting activities.
– Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.	cEO	Communication plan, including details of landowners must be kept.	During construction	ECO	Monthly	Proof of communication with landowners and emergency services available.

### 5.22 Noise

**Impact Management outcome:** Unnecessary noise is prevented by ensuring that noise from construction activities is mitigated.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only;</li> </ul>	cEO Contractor	Training/ Induction of workers	During construction	cEO ECO	Daily Monthly	Training manual and attendance register available on-site.  No complaints from landowners.
<ul style="list-style-type: none"> <li>All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained;</li> </ul>	Contractor	Vehicle checklist and maintenance plan available	During construction	cEO ECO	Daily Monthly	All vehicles and machinery on-site are in good working order and/or roadworthy.
<ul style="list-style-type: none"> <li>Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or</li> </ul>	cEO	Complaints	During	ECO	Monthly	Complaints

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
applicable, provide transport to and from the site on a daily basis for construction workers;		register	construction			register kept on-site and captures how complaints were addressed.
<ul style="list-style-type: none"> <li>Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.</li> </ul>	<b>cEO</b>	Code of Conduct copy available and displayed at site office.	During construction	ECO	Monthly	Code of Conduct copy is available and displayed at site office.

### 5.23 Fire prevention

**Impact management outcome:** Prevention of uncontrollable fires.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Designate smoking areas where the fire hazard could be regarded as insignificant;	cEO	Designated smoking area on-site	During construction	cEO ECO	Daily Monthly	There is designated smoking area on-site and workers only smoke in designated areas.
– Firefighting equipment must be available on all vehicles located on site;	cEO	Vehicles must be fitted with fire extinguishers	During construction	cEO ECO	Daily Monthly	All construction vehicles have fire extinguishers.
– The local Fire Protection Agency (FPA) must be informed of construction activities;			During	ECO	Monthly	

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
			construction			
<ul style="list-style-type: none"> <li>Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site;</li> </ul>	cEO	Training/ Induction  FPA and emergency numbers displayed at the site office.	During construction	ECO	Monthly	Induction manual and attendance register are available.  FPA and emergency numbers are displayed at the site office.
<ul style="list-style-type: none"> <li>Two way swop of contact details between ECO and FPA.</li> </ul>	ECO	Site Supervisor, cEO and ECO have contact details of FPA.  Contact details of FPA must be kept the environmental file.	During construction	ECO	Monthly	Contact details of FPA are the environmental file.



#### 5.24 Stockpiling and stockpile areas

**Impact management outcome:** Erosion and sedimentation as a result of stockpiling are reduced.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies;</li> </ul>	cEO	Training/ Induction  Stockpiling method statement approved by ECO	During construction	cEO  ECO	Daily  Monthly	Training/ Induction manual available.  Approved stockpiling method statement available.  No erosion of stockpiles.
<ul style="list-style-type: none"> <li>All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods;</li> </ul>						
<ul style="list-style-type: none"> <li>Topsoil stockpiles must not exceed 2 m in height;</li> </ul>						
<ul style="list-style-type: none"> <li>During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.)</li> </ul>						
<ul style="list-style-type: none"> <li>Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.</li> </ul>						

#### 5.25 Finalising tower positions

<b>Impact management outcome:</b> No environmental degradation occurs as a result of the survey and pegging operations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– No vegetation clearing must occur during survey and pegging operations;	cEO	Training/ Induction	During construction	cEO ECO	Daily Monthly	Training/ Induction manual available.  No vegetation clearing observed during pegging.
– No new access roads must be developed to facilitate access for survey and pegging purposes;	cEO	Training/ Induction	During construction	cEO ECO	Daily Monthly	Training/ Induction manual available.  No new roads observed during pegging.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Project manager, botanical specialist and contractor to agree on final tower positions based on survey within assessed and approved areas;	Project Manager	Approved layout/ transmission route and tower positions.	During construction	ECO	Monthly	Towers are established on approved locations.
– The surveyor is to demarcate (peg) access roads/tracks in consultation with ECO. No deviations will be allowed without the prior written consent from the ECO.	<b>Project Manager</b>	Approved pegging approved by ECO.	During construction	ECO	Weekly	Approved pegging approved by ECO.

#### 5.26 Excavation and Installation of foundations

**Impact management outcome:** No environmental degradation occurs as a result of excavation or installation of foundations.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a recognised disposal site, if not used for backfilling purposes	cEO	Waste Management Plan approved	During construction and	cEO ECO	Weekly Monthly	Waste disposal slips are

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
		by ECO	rehabilitation.			available.
– Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes;	cEO	No spoil to be used if not mixed with 150mm of topsoil.	During rehabilitation	ECO	Monthly	No visible spoil on rehabilitated sites.
– Management of equipment for excavation purposes must be undertaken in accordance with <b>Section 5.18: Workshop equipment maintenance and storage</b> ; and	Site Supervisor	Undertake the management of equipment for excavation as per the requirements of section 5.18	During construction.	cEO ECO	Weekly Monthly	No maintenance of equipment allowed on-site. If this cannot be avoided, Management of equipment is undertaken in line with the requirement

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						s of section 5.18.
<ul style="list-style-type: none"> <li>Hazardous substances spills from equipment must be managed in accordance with <b>Section 5.17: Hazardous substances</b>.</li> </ul>	cEO	ERAP available and implemented.  Restricted areas demarcated.  Emergency numbers displayed on-site.  Trip trays provided.  Spill kits provided.	During construction	ECO	Monthly	ERAP kept on-site.  Restricted areas demarcated.  Emergency numbers displayed on-site.  Incident reports available.  Trip trays provided.  Spill kits provided.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Batching of cement to be undertaken in accordance with <b>Section 5.19 : Batching plants;</b>	cEO	Impermeable batching plant/ cement-mixing area provided and fitted is containment facility	During construction	ECO	Monthly	Impermeable batching plant/ cement-mixing area provided.
– Residual cement must be disposed of in accordance with <b>Section 5.8: Solid and hazardous waste management.</b>	cEO	Approved Waste Management Plan implemented.	During construction	ECO	Monthly	Empty cement bags are disposed as hazardous waste.

### 5.27 Assembly and erecting towers

<b>Impact management outcome:</b> No environmental degradation occurs as a result of assembly and erecting of towers.		
Impact Management Actions	Implementation	Monitoring

	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Prior to erection, assembled towers and tower sections must be stored on elevated surface (suggest wooden blocks) to minimise damage to the underlying vegetation;</li> </ul>	Contractor  Site Supervisor	Store and assemble towers and tower sections on elevated surface, preferably wooden blocks, to minimise damage to the underlying vegetation.	During construction	cEO  ECO	Weekly  Monthly	<p>Towers and tower sections are assembled on elevated surface.</p> <p>Vegetation damage is minimal.</p>
<ul style="list-style-type: none"> <li>In sensitive areas, tower assembly must take place off-site or away from sensitive positions;</li> </ul>	Contractor  Site Supervisor  cEO	<p>No assembly of towers in sensitive areas.</p> <p>Sensitive areas are demarcated.</p>	During construction	cEO  ECO	Weekly  Monthly	<p>No assembly of towers in sensitive areas.</p> <p>Sensitive areas are demarcated.</p>
<ul style="list-style-type: none"> <li>The crane used for tower assembly must be operated in a manner which minimises impact to the environment;</li> </ul>	Crane Operator  Site Supervisor	<p>No assembly of</p> <p>No crane mounted in sensitive areas.</p> <p>Sensitive areas</p>	During construction	cEO  ECO	Weekly  Monthly	<p>No crane mounted in sensitive areas.</p> <p>Sensitive</p>

	cEO	are demarcated.				areas are demarcated.
– The number of crane trips to each site must be minimised;	Crane Operator Site Supervisor cEO	Number of crane trips to each site must be minimized.	During construction	cEO ECO	Weekly Monthly	Number of crane trips to each site are kept at minimum.
– Wheeled cranes must be utilised in preference to tracked cranes;	Crane Operator Site Supervisor cEO	Wheeled cranes must be utilised in preference to tracked crane	During construction	cEO ECO	Weekly Monthly	Wheeled cranes are preferred over tracked crane where possible.
– Consideration must be given to erecting towers by helicopter or by hand where it is warranted to limit the extent of environmental impact;	Project Manager Contractor	Erect towers by helicopter or by hand where possible to limit the extent of environmental impact.	During construction	cEO ECO	Weekly Monthly	Towers erected by helicopter or by hand where viable.
– Access to tower positions to be undertaken in accordance with access requirements in specified in Section 8.4: Access Roads;	Contractor cEO	Pre-negotiated access roads used.	During construction	cEO ECO	Weekly Monthly	Drivers use approved access



		Route plan communicated with drivers.				roads.
– Vegetation clearance to be undertaken in accordance with general vegetation clearance requirements specified in Section 8.10: Vegetation clearing;	cEO	Vegetation clearance to be undertaken in accordance with general vegetation clearance requirements specified in Section 8.10: Vegetation clearing.	Pre and during construction	cEO ECO	Weekly Monthly	Vegetation clearance is undertaken in accordance with general vegetation clearance requirements specified in Section 8.10: Vegetation clearing.
– No levelling at tower sites must be permitted unless approved by the Development Project Manager or Developer Site Supervisor;	Contractor	Where levelling is required, it must be approved by DPM by ECO.	During construction	cEO ECO	Weekly Monthly	Where levelling is required, it must be approved by DPM by ECO.
– Topsoil must be removed separately from subsoil material and stored for later use during rehabilitation of such tower sites;	Contractor cEO	Soil-stripping method statement approved by	During construction	cEO ECO	Weekly Monthly	Soil-stripping done according to the

		ECO.				approved method statement.
– Topsoil must be stored in heaps not higher than 1m to prevent destruction of the seed bank within the topsoil;	Contractor cEO	Soil-stripping method statement approved by ECO.	During construction	cEO ECO	Weekly Monthly	Soil-stripping done according to the approved method statement.  No soil heaps higher than 1m on-site.
– Excavated slopes must be no greater than 1:3, but where this is unavoidable, appropriate measures must be undertaken to stabilise the slopes;	Contractor cEO	Excavated slopes must be no greater than 1:3.	During construction	cEO ECO	Weekly Monthly	Where unavoidable, excavated slopes greater than 1:3 must be rehabilitated immediately.
– Fly rock from blasting activity must be minimised and any pieces greater than 150 mm falling beyond the Working	Site Supervisor	Fly rock from blasting activity	During construction	ECO	Monthly	Fly rock from

Area, must be collected and removed;	cEO	must be minimised and any pieces greater than 150 mm falling beyond the Working Area, must be collected and removed.				blasting activity is minimized.  No rock pieces greater than 150 mm beyond the Working Area.
– Only existing disturbed areas are utilised as spoil areas;	cEO	Only existing disturbed areas are utilised as spoil.  Layout plan approved by ECO.	During construction	ECO	Monthly	Only existing disturbed areas are utilised as spoil.  Layout plan approved by ECO.
– Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum;	Contractor	Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum.	During construction	ECO	Monthly	Drainage is provided to control groundwater exit gradient with the spill areas such that migration of

						finer is kept to a minimum.
<ul style="list-style-type: none"> <li>– Surface water runoff is appropriately channeled through or around spoil areas;</li> </ul>	Contract	Surface water runoff is appropriately channeled through or around spoil areas.	During construction	ECO	Monthly	Surface water runoff is appropriately channeled through or around spoil areas.
<ul style="list-style-type: none"> <li>– During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that;</li> <li>–</li> </ul>	cEO Contractor	During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that.	During rehabilitation	ECO	Monthly	During backfilling operations, soil is not dumped at the bottom of the foundation and then put spoil on top of that.
<ul style="list-style-type: none"> <li>– The surface of the spoil is appropriately rehabilitated in accordance with the requirements specified in Section 5.29: Landscaping and rehabilitation;</li> </ul>	cEO	The surface of the spoil must be appropriately rehabilitated in accordance with the	During rehabilitation	ECO	Monthly	The surface of the spoil is appropriately rehabilitate

		requirements specified in Section 5.29: Landscaping and rehabilitation.				d in accordance with the requirements specified in Section 5.29: Landscaping and rehabilitation.
<ul style="list-style-type: none"> <li>The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken at the beginning of the dry season.</li> </ul>	cEO	The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken at the beginning of the dry	During rehabilitation	ECO	Monthly	<p>The retained topsoil is spread evenly on rehabilitated areas.</p> <p>The site is re-vegetated. No soil erosion.</p>

		season.				
--	--	---------	--	--	--	--

## 5.28 Stringing

**Impact management outcome:** No environmental degradation occurs as a result of stringing.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner must avoid Access restricted areas and other sensitive areas;</li> </ul>	Contactor cEO	<p>Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations.</p> <p>In all other instances, the siting of the winch and tensioner must avoid Access restricted areas</p>	Pre and during construction	ECO	Monthly	<p>Where possible, previously disturbed areas are used for the siting of winch and tensioner stations.</p> <p>In all other instances, the siting of the winch and</p>

		and other sensitive areas				tensioner must avoid Access restricted areas and other sensitive areas
– The winch and tensioner station must be equipped with drip trays in order to contain any fuel, hydraulic fuel or oil spills and leaks;	cEO	Drip trays must be provided.	During construction	cEO ECO	Weekly Monthly	Drip trays are provided and used.
– Refueling of the winch and tensioner stations must be undertaken in accordance with Section 5.17: Hazardous substances;						
– In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along "trace-lines". Vegetation clearing must be undertaken by hand, using chainsaws and hand held implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used;	Contractor	Stringing method statement approved by ECO.  In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for stringing	During construction	cEO ECO	Weekly Monthly	In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" is cut through the vegetation for stringing purposes

		<p>purposes only and no vehicle access must be cleared along "trace-lines".</p> <p>Vegetation clearing must be undertaken by hand, using chainsaws and hand-held implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used.</p>				<p>only and no vehicle access is cleared along "trace-lines".</p> <p>Vegetation clearing is undertaken by hand, using chainsaws and hand-held implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment is used.</p>
<p>– Alternative methods of stringing which limit impact to the environment must always be considered e.g. by hand or by using a helicopter;</p>	<b>Contractor</b>	Alternative methods of stringing which	During construction	cEO	Weekly	Alternative methods of stringing



		limit impact to the environment must always be considered e.g. by hand or by using a helicopter.		ECO	Monthly	which limit impact to the environment are considered e.g. by hand or by using a helicopter.
<ul style="list-style-type: none"> <li>Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any period(s) during development, the persons affected must be given reasonable notice, in writing;</li> </ul>	<b>Contractor</b>	<p>Stringing method statement approved by ECO.</p> <p>Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any</p>	During construction	<p>cEO</p> <p>ECO</p>	<p>Weekly</p> <p>Monthly</p>	Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures are installed to facilitate access. If, for any reason, such access has to be closed for

		period(s) during development, the persons affected must be given reasonable notice, in writing.				any period(s) during development, the persons affected are given reasonable notice, in writing.
<ul style="list-style-type: none"> <li>No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing;</li> </ul>	Contractor	No services must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing.	During construction	cEO ECO	Weekly Monthly	No complaints from I&APs
<ul style="list-style-type: none"> <li>Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner;</li> </ul>	Contractor	Where stringing operations cross cultivated land, damage to crops is restricted to the minimum	During construction	cEO ECO	Weekly Monthly	No complaints from landowners.  Record of communication

		required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner.				tion with landowners.
<ul style="list-style-type: none"> <li>Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries.</li> </ul>	Contractor	Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries.	During construction	cEO ECO	Weekly Monthly	<p>No damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries.</p> <p>No complaints from landowners.</p>

#### 5.29 Socio-economic

--

<b>Impact management outcome:</b> Socio-economic development is enhanced.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Develop and implement communication strategies to facilitate public participation;	ECO Project Manager	Communication Strategy	During construction	ECO	Monthly	Communication Strategy available.  Records of communication available.  No complaints from the public.
– Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process;	Project Manager	Communication Strategy	During construction	ECO	Monthly	Communication Strategy available.  Records of communication available.  No complaints from the public.

– Sustain continuous communication and liaison with neighboring owners and residents	Project Manager	Communication Strategy	During construction	ECO	Monthly	Communication Strategy available.  Records of communication available.  No complaints from the public.
– Create work and training opportunities for local stakeholders; and	Project Manager Contractor	SDL developed and approved by Developer.  Approved SDL implemented by contractor and sub-contractors.	During construction	ECO CLO	Monthly Weekly	Register of employees kept on-site.
– Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.	Site Supervisor	Site access control, including check-in and check-out register.	During construction	cEO ECO	Daily Monthly	No workers except security personnel stay over-night on the site.  No complaints from landowners.

### 5.30 Temporary closure of site

**Impact management outcome:** Minimise the risk of environmental impact during periods of site closure greater than five days.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in <b>sections 5.17: management of hazardous substances</b> and <b>5.18 workshop, equipment maintenance and storage</b>;</li> </ul>	cEO	Waste Management Plan approved and implemented	During rehabilitation	ECO	Once-off	Bunds emptied and waste disposed of at a registered landfill site.
<ul style="list-style-type: none"> <li>Hazardous storage areas must be well ventilated;</li> </ul>	cEO	Site establishment checklist.	During construction	ECO	Monthly	Hazardous materials stored in well-ventilated mobile containers/ storehouses.
<ul style="list-style-type: none"> <li>Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service;</li> </ul>	cEO SHE Officer	Service record for fire extinguishers.  Extinguishers serviced every 12 months.	During construction	ECO	Monthly	Service record for fire extinguishers available.  Fire extinguishers service record up to date.
<ul style="list-style-type: none"> <li>Emergency and contact details displayed must be displayed;</li> </ul>	cEO	Site board must have emergency contact details.	During construction	ECO	Monthly	The site has information board with emergency contact details.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel;	cEO	Training	During construction	ECO	Once-off	Training manual and attendance register available on-site.
– Night hazards such as reflectors, lighting, traffic signage etc. must have been checked;	Site Supervisor	Training	During construction	cEO	Once-off	Night hazards such as reflectors, lighting, traffic signage are in place and effective.
– Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.;	cEO	Communication channel with local authorities established.	During construction	ECO	Once-off	Communication trail with local authorities kept in the site file.
– Structures vulnerable to high winds must be secured;	Contractor	Construction method statement	During construction	ECO	Once-off	Structures are secured.  No record/ evidence of toppled structures.
– Wind and dust mitigation must be implemented;	Contractor	Dust suppression on access roads.  Stockpiles should not be higher than two metres.	During construction	ECO	Once-off	No excessive dust observed on-site.  No complaints from landowners.
– Cement and materials stores must have been secured;	Contractor	Site layout plan approved.	During construction	ECO	Once-off	Cement and materials stored at secured and approved storage

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance of areas.
– Toilets must have been emptied and secured;	cEO	Toilets provided and secured on the ground.  Records of toilet servicing must be kept.	During construction	ECO	Once-off	Toilets are clean and locked.  Service slips available.
– Refuse bins must have been emptied and secured;	cEO	Waste Management Plan	During construction	ECO	Once-off	Bins are empty.
– Drip trays must have been emptied and secured.	cEO	Drip trays are clear of spillages.	During construction	ECO	Once-off	Drip trays are empty and clean.

### 5.31 Landscaping and rehabilitation

**Impact management outcome:** Areas disturbed during the development phase are returned to a state that approximates the original condition.

Impact Management Actions	Implementation	Monitoring
---------------------------	----------------	------------



	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed to a registered waste site and certificates of disposal provided;</li> </ul>	cEO	Rehabilitation plan approved and implemented.	During rehabilitation	ECO	Monthly	Site rehabilitated and landscaped to the original state.  No waste or spoil left of the site.
<ul style="list-style-type: none"> <li>All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983</li> </ul>	cEO	Rehabilitation plan approved and implemented.	During rehabilitation	ECO	Monthly	Site rehabilitated and landscaped to the original.
<ul style="list-style-type: none"> <li>All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983;</li> </ul>						
<ul style="list-style-type: none"> <li>Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition;</li> </ul>						
<ul style="list-style-type: none"> <li>Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners;</li> </ul>	cEO	Rehabilitation Plan approved by ECO	During rehabilitation	ECO	Monthly	Rehabilitation of tower sites and access roads done according to the approved
<ul style="list-style-type: none"> <li>Rehabilitation of tower sites and access roads outside of farmland;</li> </ul>						

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
						plan.  Site rehabilitated to their original or better state.
– Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition;	cEO	ECO approved indigenous seed mixture to be used.	During rehabilitation	ECO	Monthly	Site re-vegetated with indigenous grass
– Stockpiled topsoil must be used for rehabilitation (refer to Section <b>5.24: Stockpiling and stockpiled areas</b> )	cEO	Rehabilitation Plan approved by ECO	During rehabilitation	ECO	Once-off	Photographic evidence of use of stockpiled topsoil.
– Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion;	cEO	Rehabilitation Plan approved by ECO	During rehabilitation	ECO	Once-off	Photographic evidence of slope before seeds were sown.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed;	cEO	Rehabilitation Plan approved by ECO	During construction	ECO	Once-off	No visible weeds on top soil.
– Subsoil must be ripped before topsoil is placed;	cEO	Rehabilitation Plan approved by ECO	During construction	ECO	Once-off	Photographic evidence that subsoil was ripped before topsoil was placed.
– The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;	cEO	Rehabilitation to commence immediately upon completion of construction works.	During rehabilitation	cEO ECO	ECO Monthly	Progressive rehabilitation on-site.  No site is left for more than a week after construction work is completed.
– Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;	Contractor	Slopes to be stabilized and restored to	During rehabilitation	ECO	Monthly	Slopes have been stabilized

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly;		original state.	During rehabilitation			and restored to original state.
– Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area	cEO	ECO approved hydroseeding mixture to be used.	During rehabilitation	ECO	Monthly	Site re-vegetated with indigenous grass
– Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil.	cEO	No spoil to be used if not mixed with 150mm of topsoil.	During rehabilitation	ECO	Monthly	No visible spoil on rehabilitated sites.

## 6 ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of regulation 26(h) of the EIA Regulations.

## **PART B: SECTION 2**

### **7 SITE SPECIFIC INFORMATION AND DECLARATION**

#### **7.1 Sub-section 1: contact details and description of the project**

##### 7.1.1 Details of the applicant:

Name of applicant: Eskom Holdings SOC LTD (National Transmission Company South Africa SOC Ltd)

Tel No: 011 800 8000/ 4114

Postal Address: PO BOX 1091, Johannesburg, 2000

Physical Address: 2 Maxwell Drive, Sunninghill, Sandton, 2000

##### 7.1.2 Details and expertise of the EAP:

Name of EAP: Lloyd Malatji

Tel No: 012 844 0248

Fax No: N/A

E-mail address: [EIAs@greengoldgroup.co.za/](mailto:EIAs@greengoldgroup.co.za) [LloydM@greengoldgroup.co.za](mailto:LloydM@greengoldgroup.co.za)

Expertise of the EAP (Curriculum Vitae included):

7.1.3 Project name: Proposed Electrical Line Of 2 X 400 kV Which Runs from Aries Substation Near Kenhardt to Upington Substation Near Upington, In the Kai Garib And Khara Hais Local Municipality, Mgcawu District Municipality, Northern Cape Province

7.1.4 Description of the project: Eskom Holding SOC Limited is proposing to construct a 2X 400kV Transmission Powerline Infrastructure from Aries Substation Near Kenhardt to Upington substation near Upington. The proposed powerline length is 145 km.

##### 7.1.5 Project location:

At a regional level, the study area lies within the Northern Cape Province and is situated within the Kai! Garib Local Municipality and Khara Hais Local Municipality. The route for the proposed powerline deviation extending from the Aries substation near Kenhardt to the Upington substation near Upington is an approximate distance of 145 km.

FARMNAME	PORTI ON	FARMLABEL	MAGISDI STR	LONG	LAT
KOEGAB	00000	KOEGAB 5936/00000	KENHAR DT	20,78479 648	- 28,97759 644
GEEL KOP	00000	GEEL KOP 45628/00000	GORDON IA	21,00142 453	- 28,58074 797
BLOEMSMOND	00005	BLOEMSMOND 45528/00005	GORDON IA	21,01289 908	- 28,56567 261
ZOOVOORBY	00002	ZOOVOORBY 45828/00002	GORDON IA	20,95465 166	- 28,59788 804
WIT VLEI	00002	WIT VLEI 10336/00002	KENHAR DT	20,71862 605	- 29,11199 203
GROOT RIET	00004	GROOT RIET 16236/00004	KENHAR DT	20,73824 827	- 29,27907 895
ZWART BOOIS BERG SUID	00000	ZWART BOOIS BERG SUID 66428/00000	GORDON IA	20,71088 603	- 28,75199 720
EENDUIN	00040	EENDUIN 46528/00040	GORDON IA	20,86358 695	- 28,66625 175
TUNGSTEN LODGE	00000	TUNGSTEN LODGE 63828/00000	GORDON IA	21,10306 410	- 28,56044 937
ZWART BOOIS BERG ANNEX	00007	ZWART BOOIS BERG ANNEX 47528/00007	GORDON IA	20,68130 953	- 28,73454 312
TKABIES	00051	TKABIES 46128/00051	GORDON IA	20,87649 562	- 28,64336 393
LOXTON VALE	00009	LOXTON VALE 46428/00009	GORDON IA	20,80700 025	- 28,64679 697
DE BANKEN	00004	DE BANKEN 13036/00004	KENHAR DT	20,74461 195	- 29,20372 662
KOEGAB	00004	KOEGAB 5936/00004	KENHAR DT	20,72890 732	- 28,98455 088
ROOIPUNT	00000	ROOIPUNT 61728/00000	GORDON IA	21,02444 907	- 28,47995 348
ZWART BOOIS BERG ANNEX	00002	ZWART BOOIS BERG ANNEX 47528/00002	GORDON IA	20,68908 986	- 28,70277

					540
PYP KLIP WEST	00001	PYP KLIP WEST 12936/00001	KENHAR DT	20,71871 741	- 29,14838 272
OMKYK	00001	OMKYK 6136/00001	KENHAR DT	20,68491 606	- 28,86668 059
PLAAS NO. 584	00000	PLAAS NO. 584 58428/00000	GORDON IA	20,71926 769	- 28,69952 960
OMKYK	00000	OMKYK 6136/00000	KENHAR DT	20,71031 644	- 28,89473 547
KLEIN ZWART BAST	00000	KLEIN ZWART BAST 18836/00000	KENHAR DT	20,74162 251	- 29,46689 839
DE BANKEN	00000	DE BANKEN 13036/00000	KENHAR DT	20,75448 994	- 29,23811 353
KLEIN ZWART BAST	00001	KLEIN ZWART BAST 18836/00001	KENHAR DT	20,75513 892	- 29,52322 844
DE TUIN ZUID	00001	DE TUIN ZUID 16336/00001	KENHAR DT	20,76514 112	- 29,39999 251
PLAAS NR 616	00000	PLAAS NR 616 61628/00000	GORDON IA	20,89650 691	- 28,62258 249
EENDUIN	00039	EENDUIN 46528/00039	GORDON IA	20,83492 883	- 28,65995 588
KLEIN ZWART BAST	00002	KLEIN ZWART BAST 18836/00002	KENHAR DT	20,79411 712	- 29,49248 444
MIDDEL POST	00000	MIDDEL POST 6036/00000	KENHAR DT	20,77052 572	- 28,93234 562
FRIERS DALE	00027	FRIERS DALE 46628/00027	GORDON IA	20,77946 159	- 28,63995 810
DE TUIN ZUID	00002	DE TUIN ZUID 16336/00002	KENHAR DT	20,76385 315	- 29,36448 812
DE TUIN ZUID	00003	DE TUIN ZUID 16336/00003	KENHAR DT	20,73061 558	- 29,40830 774
DE BANKEN	00001	DE BANKEN 13036/00001	KENHAR DT	20,72035 426	- 29,25071 350
WIT VLEI	00000	WIT VLEI 10336/00000	KENHAR DT	20,70707 166	- 29,08327

					557
CURRIES CAMP	00001	CURRIES CAMP 45728/00001	GORDON IA	20,97359 553	- 28,57876 139
DIE PLAAS	00000	DIE PLAAS 60228/00000	GORDON IA	20,76672 139	- 28,67704 393
DE BANKEN	00010	DE BANKEN 13036/00010	KENHAR DT	20,74564 684	- 29,22699 670
GROOT RIET	00005	GROOT RIET 16236/00005	KENHAR DT	20,70062 710	- 29,30319 269
DE BANKEN	00009	DE BANKEN 13036/00009	KENHAR DT	20,75160 488	- 29,21959 679
DYASONS KLIP	00012	DYASONS KLIP 45428/00012	GORDON IA	21,04273 525	- 28,54726 250
GORDONIA RD	00003	GORDONIA RD 65228/00003	GORDON IA	20,70277 389	- 28,73664 353
PYP KLIP WEST	00002	PYP KLIP WEST 12936/00002	KENHAR DT	20,72069 646	- 29,17491 020
KLEIN GOEGAB	00000	KLEIN GOEGAB 10236/00000	KENHAR DT	20,65194 784	- 29,04333 539
PLAAS NO. 595	00000	PLAAS NO. 595 59528/00000	GORDON IA	20,71441 586	- 28,65323 431
GROOT RIET	00007	GROOT RIET 16236/00007	KENHAR DT	20,74981 620	- 29,31672 245
BLOEMSMOND	00014	BLOEMSMOND 45528/00014	GORDON IA	21,02258 841	- 28,55565 078

MIN_REGION	ERF_NO	Long	Lat
OLYVENHOUTS DRIFT SETTLEMENT (Gordonia)	1080	21,09019000	-28,48668000
KAKAMAS SOUTH SETTLEMENT	1219	20,68633000	-28,78120000
KAKAMAS SOUTH SETTLEMENT	1738	20,68172000	-28,79489000
KEIMOE	1152	20,91299000	-28,58169000
KAKAMAS SOUTH SETTLEMENT	1184	20,70846000	-28,82659000
KAKAMAS SOUTH SETTLEMENT	1486	20,70612000	-28,79111000



#### 7.16 Preliminary technical specification of the overhead transmission and distribution:

- Length: 145km
- Tower parameters
  - Number and types of towers: 318

518E	2
518H	58
520B	13
529A	198
517E	22
517F	13
518C	9
518DR	3
<b>Total</b>	<b>318</b>

- Tower spacing (mean and maximum)

Minimum spacing = 153m

Mean = 455m

Maximum spacing = 654m

- Tower height (lowest, mean and height)

Lowest = 24.35m

Mean = 37.15m

Tallest = 42.15m

- Conductor attachment height (mean)

Mean CAH = 28.3m

- Minimum ground clearance

Ground clearance = 6.17m

## 7.2 Sub-section 2: Development footprint site map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. raptor nest, threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features in the surrounding landscape. The overhead transmission and distribution profile shall be illustrated at an appropriate resolution to enable fine scale interrogation. It is recommended that <20 km of overhead transmission and distribution length is illustrated per page in A3 landscape format. Where considered appropriate, photographs of sensitive features in the context of tower positions shall be used.

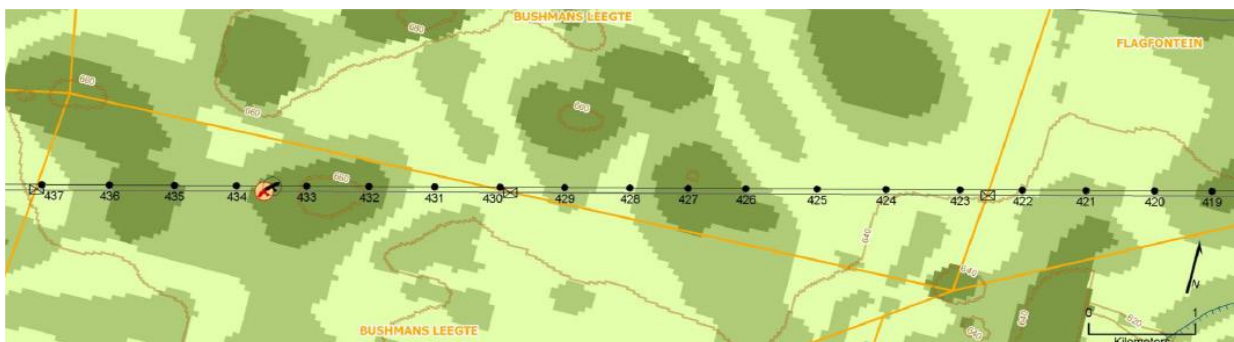


Figure 1: Example of an environmental sensitivity map in the context of a final overhead transmission and distribution profile

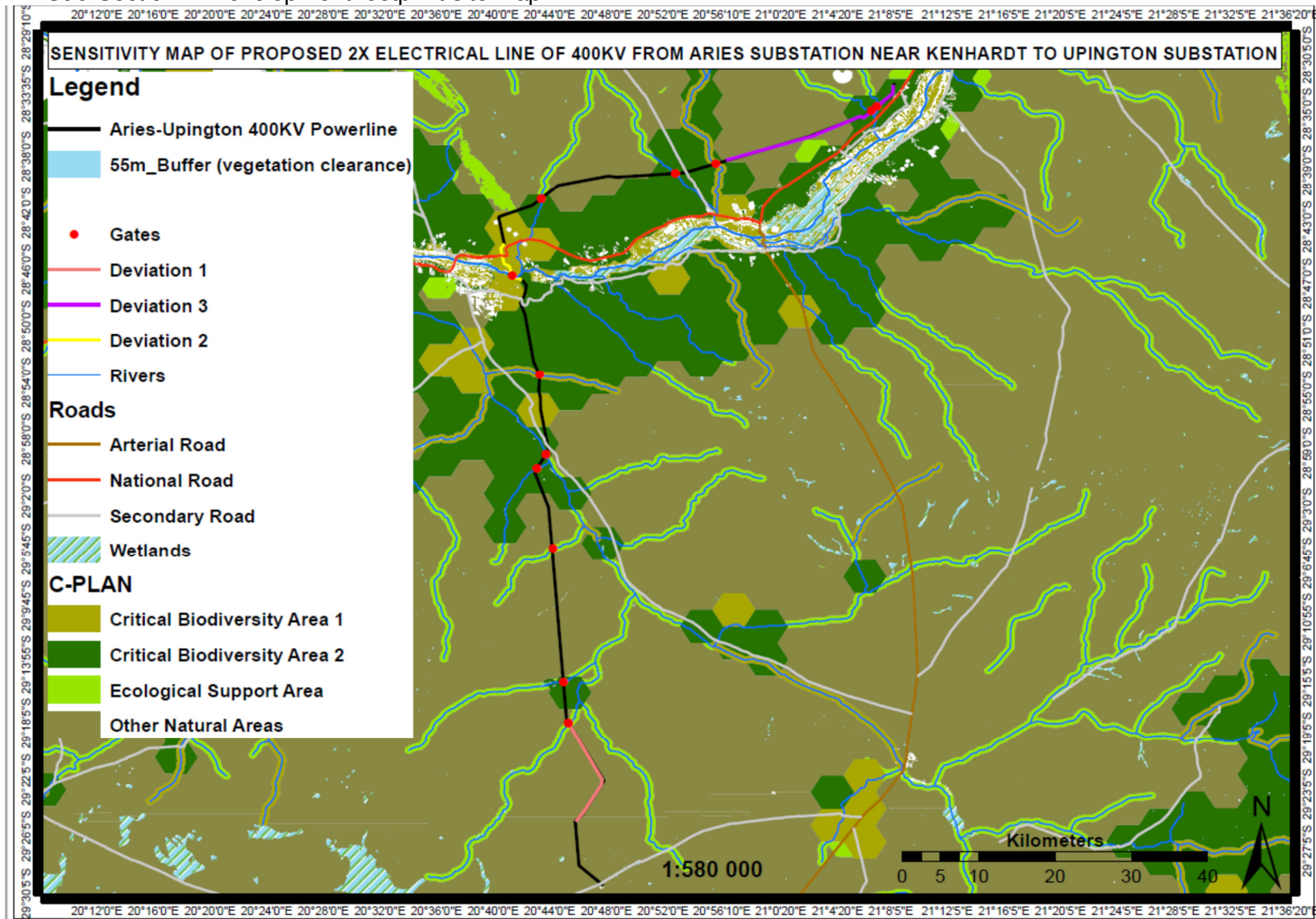
## 7.3 Sub-section 3: Declaration

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 days prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Signature Proponent/applicant/ holder of EA

Date:

## 7.2 Sub-Section 2: Development footprint site map



---

#### **7.4 Sub-section 4: amendments to site specific information (Part B; section 2)**

Should the EA be transferred to a new holder, Part B: Section 2 must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

## PART C

### 8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr template, to manage impacts, those impact management outcomes and actions must be included in this section. These specific management controls must be referenced spatially, and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved generic EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

## **SOLAR CSP INTEGRATION PROJECT:**

### **PROJECT 1 – SOLAR SUBSTATION, 2 x 400 KV POWER LINES FROM ARIES TO THE SOLAR SUB AND 400 KV POWER LINES FROM NIEUWEHOOP TO THE SOLAR SUB.**

#### **Proponent:**

Eskom Holdings SOC Limited  
Megawatt Park  
Maxwell Drive, Sunninghill

**DEA Reference Number: 12/12/20/2606**

**NEAS Reference Number: DEA/EIA/0000785/2011**

**December 2015**

**Project: 12726**

---

## **SITE-SPECIFIC ENVIRONMENTAL MANAGEMENT PROGRAMME**

---

---

## TABLE OF CONTENTS

---

SECTION	PAGE
<b>1 INTRODUCTION .....</b>	<b>1</b>
1.1 Purpose of this EMPr .....	1
1.2 Details of Environmental Assessment Practitioner (EAP).....	2
1.3 Legal Context .....	2
<b>2 PROJECT BACKGROUND .....</b>	<b>5</b>
2.1 The Solar Park Integration Project .....	5
2.2 Solar - Nieuwehoop servitude .....	6
<b>3 PROJECT ACTIVITY DESCRIPTION .....</b>	<b>7</b>
3.1 Project Infrastructure / Components.....	7
3.2 Project Phases .....	7
<b>4 RECEIVING ENVIRONMENT .....</b>	<b>9</b>
4.1 Climate and Air Quality .....	9
4.2 Geology .....	9
4.3 Topography .....	9
4.4 Soil and land capability .....	10
4.5 Surface water .....	10
4.6 Riparian zones.....	10
4.7 Wetlands .....	11
4.8 Terrestrial Ecology and Biodiversity .....	11
4.9 Avifauna .....	12
4.10 Socio-Economic Impact Assessment.....	14
4.11 Archaeological, Cultural and Historical.....	15
<b>5 AUTHORISED SOLAR PARK TO NIEUWEHOOP SERVITUDE .....</b>	<b>17</b>
5.1 Authorised preferred alternatives: .....	17
5.2 Servitude negotiations .....	17
5.3 Corridor walk-down.....	21
5.4 Delineation of riparian zones .....	31
<b>6 ENVIRONMENTAL GUIDELINES, STANDARDS AND PERMITS.....</b>	<b>32</b>
6.1 Environmental authorisation .....	32
6.2 Environmental Guidelines and Standards .....	32
6.3 Environmental Permitting Requirements .....	33
<b>7 ROLES AND RESPONSIBILITIES.....</b>	<b>37</b>
7.1 Contractual obligation .....	37
7.2 Responsibilities and Duties.....	37
7.3 Training .....	42
7.4 Awareness and Competence .....	42
7.5 Monitoring.....	43
7.6 Non-Conformance and Corrective Action.....	44
7.7 Documentation and Reporting .....	45
7.8 Public Communication and Liaison with I&APs .....	46
7.9 Commissioning of Tenders for the Project .....	46
7.10 Environmental Authorisation .....	47
7.11 Environmental Management Measures.....	47
<b>8 ENVIRONMENTAL SPECIFICATIONS.....</b>	<b>48</b>
8.1 Construction Initiation .....	48
8.2 Site Establishment and Demarcation .....	51

8.3	Water Management (including Storm water, Water Sources, Wet Areas).....	57
8.4	Hazardous Substance Spills .....	60
8.5	Delivery of Materials .....	62
8.6	Building, Civil's and Structural Steel Work .....	63
8.7	Circuit Breakers and Current Transformers.....	65
8.8	Access Roads.....	66
8.9	Waste Management.....	68
8.10	Fire Prevention .....	71
8.11	Designated Storage Areas.....	72
8.12	Tower Positions .....	75
8.13	Claims from Damages .....	77
8.14	Erosion, Donga and River Crossings .....	78
8.15	Flora Management (including Vegetation Clearing, General, and Herbicides) .....	79
8.16	Fauna Management.....	86
8.17	Interaction with landowners .....	88
8.18	Noise / Working Hours .....	89
8.19	Infrastructure Planning and Management .....	90
8.20	Heritage Resources .....	91
8.21	Residential Property .....	92
8.22	General Requirements during Construction .....	93
8.23	Scheduling of Management Measures.....	93
8.24	Monitoring.....	95
<b>9</b>	<b>EMERGENCY NUMBERS.....</b>	<b>97</b>



---

## LIST OF TABLES

---

Table 1-1: Legal Requirements for this EMPr.....	3
Table 5-1: Tower locations, affected land owners and land portions .....	18
Table 5-2: Botanical sensitivities and recommendation per tower location .....	25
Table 5-3: Avifaunal sensitivities and recommendation per tower location .....	27
Table 5-4: Heritage sensitivities and recommendation per tower location .....	29
Table 6-1: Typical noise rating levels for ambient noise in districts.....	33
Table 6-2: Protected species that may occur within the study site.....	34
Table 8-1: Environmental Management Measures during construction Initiation .....	48
Table 8-2: Environmental Management Measures during site establishment and demarcation .....	51
Table 8-3: Environmental Management Measures for Water Management. ....	57
Table 8-4: Environmental Management Measures for Hazardous Substance Spills .....	60
Table 8-5: Environmental Management Measures for the delivery of materials.....	62
Table 8-6: Environmental Management Measures for building, civil's and Structural Steel Work .....	63
Table 8-7: Environmental Management Measures for Circuit Breakers and Current Transformers.....	65
Table 8-8: Environmental Management Measures for Access Roads. ....	66
Table 8-9: Environmental Management Measures for waste management. ....	68
Table 8-10: Environmental Management Measures for Fire Prevention. ....	71
Table 8-11: Environmental Management Measures for Designated Storage Areas.....	72
Table 8-12: Environmental Management Measures for Tower Positioning. ....	75
Table 8-13: Environmental Management Measures for Claims from Damages. ....	77
Table 8-14: Environmental Management Measures for Erosion, Donga and River Crossings. ....	78
Table 8-15: Environmental Management Measures for Flora Management. ....	79
Table 8-16: Environmental Management Measures for Fauna Management. ....	86
Table 8-17: Environmental Management Measures for Interaction with Adjacent Land Owners .....	88
Table 8-18: Environmental Management Measures for Noise Management. ....	89
Table 8-19: Environmental Management Measures for Infrastructure. ....	90
Table 8-20: Environmental Management Measures for Heritage Resources.....	91
Table 8-21: Environmental Management Measures for Management of residential property .....	92
Table 8-22: Checklist for monitoring environmental performance on site.....	94

---

## **Appendices**

---

Appendix A: Consolidated walk-down assessment report

Appendix B: Specialist walk-down reports

Appendix C: Environmental Authorisation

---

## GLOSSARY OF TERMS

---

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

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

**Environmental Management Programme:** A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive environmental impacts and limiting or preventing negative environmental impacts are implemented during the life-cycle of a project. This EMPr focuses primarily on the construction phase and operational phase of the proposed project. This Environmental Management Programme is not part of an Environmental Management System and has not been compiled in terms of the ISO 14001 standard.

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

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

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

**Environmental impact:** A change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation’s activities, products or services.

**Eskom’s Project Manager:** The person appointed by Eskom from time to time to act in the capacity and notified, by name and in writing by Eskom to the Contractor, to act as required in the contract.

**Incident:** An undesired event which may result in a significant environmental Impact but can be managed through internal response.

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

---

## ABBREVIATIONS

---

BDF .....	Bird Flight Diverter
C.....	Contractor
CBA .....	Critical Biodiversity Area
CSP .....	Concentrating Solar Power
DAFF .....	Department of Agriculture, Forestry and Fisheries
DEA .....	Department of Environmental Affairs
DoE .....	Department of Energy
DWS .....	Department of Water and Sanitation
EA.....	Environmental Authorisation
EAP .....	Environmental Assessment Practitioner
ECO .....	Environmental Control Officer
EIA.....	Environmental Impact Assessment
EIR .....	Environmental Impact Report
EM.....	Environmental Manager
EMPr .....	Environmental Management Program (NEMA)
ESA .....	Early Stone Age
GN .....	Government Notice
HIA .....	Heritage Impact Assessment
I&APs .....	Interested and Affected Parties
IEM .....	Integrated Environmental Management
IUCN.....	International Union for Conservation of Nature
IWULA .....	Integrated Water Use Licence Application
LSA.....	Later Stone Age
MSA.....	Middle Stone Age
NEMA .....	National Environmental Management Act
NEM:BA.....	National Environmental Management: Biodiversity Act
NEM:WA.....	National Environmental Management: Waste Act
NFA .....	National Forestry Act
NFEPA .....	National Freshwater Ecosystem Priority Area
NWA .....	National Water Act
PES .....	Present Ecological Status
PM .....	Project Manager
S&EIR.....	Scoping and Environmental Impact Reporting Process
SAHRA .....	South African Heritage Resources Agency
SANBI.....	South African National Biodiversity Institute
SHEQO .....	Safety, Health, Environment and Quality Officer
ToR.....	Terms of Reference

---

## **1 INTRODUCTION**

---

This section constitutes the site-specific EMPr for the construction and operation of the Nieuwehoop – Solar power lines and the Solar Substation.

### **1.1 PURPOSE OF THIS EMPR**

The preparation of an Environmental Management Programme (EMPr) is recognised as a tool in Integrated Environmental Management (IEM) to mitigate or minimise negative impacts and enhances positive impacts on site. Typically an EMPr document is aligned to the project life cycle addressing each project phase i.e. the Construction, Operation and Decommissioning phases.

An EMPr, in the context of the EIA Regulations (2010 and 2014), is a tool that takes a project from a high level consideration of issues down to a detailed workable action plan that can be implemented in a cohesive and controlled manner. An EMPr is defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction phase of a project are prevented and that the positive benefits of the projects are enhanced”. Impacts range from those incurred during start up (site clearing, erection of the construction camp), and to those incurred during operation. Specifically, the objectives of this EMPr can be articulated as follows:

- To give effect to the construction related requirements;
- To give effect to the environmental commitments to the various role players;
- To ensure that these requirements / commitments are expressed in a manner that is accessible to all parties and is binding upon those responsible for project implementation;
- To ensure that sufficient resources are allocated to the project budget in order to give effect to the environmental requirements / commitments, and to ensure that the scale of EMPr-related interventions is consistent with the significance of identified impacts;
- To provide a coherent and pragmatic framework for the implementation of the requirements, ranging from the roles and responsibilities of the key project participants to the auditing and reporting of compliance;
- To facilitate appropriate and proactive response to unforeseen events or changes in project implementation that were not considered in the EIA process;
- To ensure that the construction phase of the project does not result in undue or reasonably avoidable adverse environmental impacts, and that any potential environmental benefits are enhanced; and
- This report constitutes the site-specific EMPr for the construction and operation of the 400kV transmission line from the Solar Park substation to Nieuwehoop substation. This site-specific EMPr has been compiled according to the findings of the

environmental impact assessment, Environmental Authorisation issued on 14 February 2014 for the proposed transmission line development between Solar Park and Nieuwehoop substation, and findings of the heritage, botanical and avifauna walk downs undertaken during October 2015.

## **1.2 DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)**

In terms of the National Environmental Management Act ([NEMA] No 107 of 1998) and Environmental Impact Assessment (EIA) Regulations (Government Notice Regulation [GNR] 982 to 985 of 2014) the proponent must appoint an EAP to undertake an EIA and / or PPP for listed activities regulated in terms of the aforementioned act. In this regard, Eskom appointed Zitholele Consulting (Pty) Ltd. (Zitholele) to undertake the EIA for the proposed project, in accordance with the aforementioned regulations.

Zitholele is an empowerment company formed to provide specialist consulting services primarily to the public sector in the fields of Water Engineering, Integrated Water Resource Management, Environmental and Waste Services, Communication (public participation and awareness creation) and Livelihoods and Economic Development.

Zitholele Consulting has no vested interest in the proposed project and hereby declares its independence as required by the EIA Regulations. The details of the EAP representatives are listed below.

The details of the key individual representing Zitholele, and acting as the EAP on this project is given below.

Name:	Dr Mathys Vosloo
Company Represented:	Zitholele Consulting (Pty) Ltd.
Address:	P O Box 6002, Halfway House, 1685
Telephone:	011 207 2060
Fax:	086 676 9950
E-mail:	<a href="mailto:MathysV@zitholele.co.za">MathysV@zitholele.co.za</a>

Dr. Mathys Vosloo was the Project Leader for this project and holds a Ph.D. in Zoology. Dr Vosloo is a well-qualified and technically proficient environmental and natural scientist with 10 years environmental management and consulting experience. He is a registered professional natural scientist (Pr. Sci. Nat.) with the South African Council for Natural Scientific Professionals (SACNASP). His experience ranges from EIA and Strategic Environmental Assessment (SEA) services to project management and State of the Environment Reporting (SOER). Mathys has done numerous projects in the power generation, linear infrastructure and infrastructure development industries.

## **1.3 LEGAL CONTEXT**

A growing awareness of the environment and an increase in the number of environmental laws and regulations, present company management with a daunting task of monitoring,

interpreting and implementing systems to produce a workable plan to comply with legal requirements.

The list below was compiled to ensure that the applicant is aware of their legal responsibilities and liabilities during the implementation of the ash storage facility.

The Contractor should note that obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. Non-compliance to environmental law is a criminal offence and if prosecuted Eskom will be liable for any environmental damage incurred.

**Table 1-1: Legal Requirements for this EMPr**

Act name	Act no	Notes/remarks
The Constitution	108 of 1996	Includes the Bill of Rights, Environmental rights, Rights to property, Administrative justice and Access to information, <i>inter alia</i> .
National Environmental Management Act	107 of 1998	List of activities and competent authorities identified in terms of Sections 24 and 24D.
EIA regulations (GNR 982 to 985), in terms of NEMA	107 of 1998	Listed activities identified that requires environmental impact assessment before environmental authorisation can be granted.
National Environmental Management: protected Areas Act	57 of 2003	Provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes.
National Environmental Management: Biodiversity Act	10 of 2004	Strategy for achieving the objectives of the United Nation's Convention on Biological Diversity, to which South Africa is a signatory.
Conservation of Agricultural Resources Act	43 of 1983	Control of utilisation and protection of wetlands; soil conservation; control and prevention of veld fires; control of weeds and invader plants.
The National Environmental Management: Waste Act	59 of 2008	☞ Waste management ☞ Application of waste disposal license
National Heritage Resources Act	25 of 1999	Section 38 provides for Heritage Impact Assessments (HIAs), which are not already covered under the ECA.
Atmospheric Pollution Prevention Act	45 of 1964	Provides for control of dust control and air pollution.
National Environmental Management: Air Quality Act	39 of 2004	Control of dust, noise and offensive odours.
Fencing Act	31 of 1963	Any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5 metres on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.
National Forest Act	84 of 1998	No person may cut, disturb, damage or destroy any indigenous, living tree in a natural forest, except in terms of a licence issued under section 7(4) or section 23.
Veld and Forest Fires Act	101 of 1998	Prevention of unauthorised veld and forest fires
Hazard substances Act, and regulations	15 of 1973 of	Provides for the definition, classification, use, operation, modification, disposal or dumping of

Act name	Act no	Notes/remarks
		hazardous substances.
Occupational Health and Safety Act	85 of 1993	Prescribes health and safety measures necessary to adhere to for all construction workers
Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act	36 of 1947	Control of the use of registered pesticides, herbicides (weed killers) and fertilisers. Special precautions must be taken to prevent workers from being exposed to chemical substances in this regard.
National Water Act, and regulations	36 of 1998	Prevention of effects of pollution, control of emergency incidents, and water use and licencing.
All relevant Provincial and Municipal bylaws		

The following Eskom guidelines and standards should also be considered during the pre-construction, construction and operational phases of the project:

- Transmission bird collision prevention guideline, Ref 41-335, 2010
- Bird nesting guidelines, Ref 41-333, 2010
- Clearing and maintenance of servitude routes, Ref 34-1454, 2008
- Access to farms, Ref TPC41-340, 2006
- Transmission bird perch guidelines, Ref TGL41-332
- Transmission servitude gates standard, Ref FGL41-338
- Herbicide management, Ref ESKPBAAD4, 2002
- The safe use of pesticides and herbicides, Ref ESKASAAL0, 2002
- Transmission environmental policy, Ref TPL41-435
- Transmission line towers and line construction, Ref TRMSCAAC1, 2001
- Soil erosion guideline, Ref 41-337, 2010; and
- Vegetation management guideline, 41-334, 2010.



---

## **2 PROJECT BACKGROUND**

---

### **2.1 THE SOLAR PARK INTEGRATION PROJECT**

Whilst Eskom's reliance on coal fired power stations has allowed for the generation of some of the cheapest electricity in the world at ~R 10/W, it has resulted in South Africa being the largest producer of greenhouse gases in Africa, and one of the Top 20 greenhouse gas producing countries in the world.

South Africa being committed to reducing Carbon emissions, is a signatory to the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, and is in the process of implementing strategies aimed at reducing the countries carbon emissions. Furthermore, Eskom is committed to supporting the government's renewable energy efforts and aims to deliver 2 400 GWh towards the Department of Minerals and Energy's (DME's) renewable energy target by 2013<sup>1</sup>. Eskom has committed to reducing coal's current ~90 % share of its primary energy mix to 78 % by the year 2012 and to 70 % by the year 2025<sup>2</sup> through various projects.

Demonstration projects and research, undertaken by Eskom, have shown that both solar and wind energy show great potential in South Africa. As a result (and in view of reducing their carbon footprint) Eskom is looking to increase the renewable energy component of its supply mix to at least 1 600 MW by 2025.

The Upington area has been identified as one of the highest solar radiation locations in the world, providing the best opportunities for using the sun to generate electricity. In an effort to utilise renewable energy resources to meet the growing demand for electricity, the South African Government proposes the establishment of a R 150 billion Solar Park at Klipkraal , ~15 km west of Upington in the Northern Cape. The Solar Park will use the sun's energy to eventually generate 5 000 MW of electricity.

Eskom will construct a 100 MW Concentrating Solar Power (CSP) plant at the Solar Park. This employs an array of mirrors controlled by tracking systems to focus a large area of sunlight into a small beam. The resulting heat is used to generate electricity. CSP also has the backing of the World Bank<sup>3</sup>, which views it as the only zero-emission technology that could potentially rival coal-fired power. Eskom received a positive Record of Decision (RoD), approving a 100 MW CSP facility for this project in August 2007, which was amended on 26 June 2013.

---

<sup>1</sup> Eskom (November 2008): Renewable Sources of Primary Energy Revision 2. Eskom Fact Sheet: RW0001.

<sup>2</sup> <http://www.safrica.info/business/economy/infrastructure/energy.htm>

<sup>3</sup> WORLD BANK GEF, 2006. Assessment of the World Bank/GEF Strategy for the Market Development of Concentrating Solar Thermal Power

## 2.2 SOLAR - NIEUWEHOOP SERVITUDE

This report has been compiled in terms of the **S&EIR No 1** (Solar Park to Aries and Solar Park to Nieuwehoop substation) application and addresses the following components of the Solar Park Integration Project (a detailed description of these projects components is given in Section 5):

1. Solar Park substation (132 kV and 400 kV);
2. 2 x ( $\pm$ ) 125 km of 400 kV lines from Solar Park to Aries substation (southwest of Kenhardt) and associated feeder bays;
3. 1 x ( $\pm$ ) 70 km of 400 kV line from Solar Park to Nieuwehoop substation (northeast of Kenhardt) and associated feeder bays;
4. 1 x River Crossing of the Orange River for transmission line from Solar Park Substation to Aries Substation; and
5. 1 x River Crossing of the Orange River for transmission line from Solar Park Substation to Nieuwehoop Substation.

**This site-specific EMPr will specifically focus on components 1, 3 and 5 relating to the construction of the Solar Park Substation and 400 kV power line from the Solar Park substation to the Nieuwehoop substation.**

---

### 3 PROJECT ACTIVITY DESCRIPTION

---

#### 3.1 PROJECT INFRASTRUCTURE / COMPONENTS

Infrastructure requirements in terms of this phase of the proposed project are as follows:

1. Solar Park Substation (New):

- 5 x 500 MVA 132 / 400 kV transformer & associated switchgear
- Establish 5 x 400 kV transformer feeder bay;
- Establish 13 x 132 kV transformer feeder bay.

2. Aries Substation (Existing):

- Establish 2 x 400 kV transformer feeder bay;
- Add a 400 / 132 kV transformer.
- 132 kV busbar
- 400 / 132 kV 500 MVA x 3 transformers
- 8 x 132 kV feeder bays and associated lines

3. Nieuwehoop Substation (Existing):

- Establish 2 x 400 kV transformer feeder bay;
- Add a 400 / 132 kV transformer.
- 132 kV busbar
- 400 / 132 kV 500 MVA x 3 transformers
- 8 x 132 kV feeder bays and associated lines

4. Transmission Lines (New)

- 2 x ±130 km 400 kV power lines between the CSP and Aries Substation.
- 1 x ±75 km 400 kV power line between the CSP and Nieuwehoop Substation.

#### 3.2 PROJECT PHASES

##### 3.2.1 Construction Phase

The construction phase for the proposed project will entail the following process post authorisation:

- |                          |                                                                                                                                                                                                                                               |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>EA compliance:</i> | Conditions stipulated in the Environmental Authorisation that has been issued must be complied with before construction commence. These conditions include a corridor (servitude) walk-down by a heritage, avifauna and botanical specialist. |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

2. *Servitude negotiations:* Eskom will at this point negotiate with affected land owners to register a power line servitude over the affected properties. This process often results in amendments to the authorised route alignment.
3. *Corridor walk-down:* To ensure that all site specific sensitivities are avoided. During this process the exact co-ordinates of the proposed pylons will be established.
4. *Construction Camps:* The location of the construction camps was determined during the EIA. During the construction phase the construction camp will be established.
5. *Vegetation clearance:* A 55 metre (22.5 metres on either side of the power line) servitude is required for the proposed 400 kV power line, tall trees will be pruned, or where absolutely unavoidable, cleared along the entire length of the servitude (the vegetation will also be maintained by Eskom in the operational phase of the project).
6. *Pylon footings:* Foundations will be laid for the footings of the pylons.
7. *Steelwork structures:* The towers will be erected in segments.
8. *Stringing:* Once the towers have been erected, cables will be strung between the towers.
9. *Feeder bays and Transformers:* Feeder bays and transformers will be erected in the footprint of the new Solar Park and Nieuwehoop substation.

### **3.2.2 Operational and Maintenance Phase**

During operations, Eskom requires access to the servitude for maintenance activities. Maintenance activities are specialised and are, therefore, carried out by Eskom employees. During the operational life of the power line, there will be no people housed along the servitude.

### **3.2.3 Decommissioning Phase**

The following are assumed:

1. The physical removal of the power line infrastructure would entail the reversal of the construction process.
2. A rehabilitation programme would need to be agreed upon with the landowners (if applicable) before being implemented.
3. Materials generated by the decommissioning process will be disposed of according to the Waste Hierarchy i.e. wherever feasible materials will be reused, then recycled and lastly disposed of. Materials will be disposed of in a suitable manner, in a suitably licensed facility. All of the aforementioned decommissioning activities would be subject to a separate EIA and environmental authorization at the appropriate time.

---

## **4 RECEIVING ENVIRONMENT**

---

### **4.1 CLIMATE AND AIR QUALITY**

The study area is located in the north western portion of South Africa. This area receives very variable late summer rainfall between February and April. The study area receives between 70 – 200 mm of precipitation annually and is located in one of the warmer parts of the country where the mean maximum and minimum temperatures range from 40.6 °C in summer to -3.7 °C in winter. The mean annual temperature is 17.4 °C. For the entire study area there is very low wind flow and no main wind direction. Whirl winds (dust devils) are common on hot summer days. The study area is located in an area with very low frequency of lightning strikes.

### **4.2 GEOLOGY**

A sizable portion (>30 %) of the study area is covered by recent (Quaternary) alluvium and calcrete. Superficial deposits of the Kalahari Group are also present in the east. The extensive Palaeozoic diamictites of the Dwyka Group also outcrop in the area as do gneisses and metasediments of Mokolian age. Due to the nature of the geology in the study area there is no potential seismic sensitivities. Additionally the proposed footings for the power line towers do not require deep excavations and consequently there are no potential impacts or sensitivities in terms of geology

### **4.3 TOPOGRAPHY**

The altitude in the study area ranges from 600 mamsl (metres above mean sea level) to 1800 mamsl. The highest parts of the study area are in the eastern portions (Olifantshoek) and in the southern portions (Kenhardt) and the lowest portions are in the southern portions of the study area (Orange River). The study area comprises of one major valley in the Orange River Basin and the Kalahari that all generally drain eastward. The area northeast of the Orange River is dominated by the Kalahari dunes and intermittent pans.

The Langberge, a long linear mountain range that runs north-south through the study area, is situated on the eastern end of the study area. The area south of the Orange River is dominated by a flat plain with very few topographic features. The area between the CSP site and the substations at Aries and Nieuwehoop is very flat – the lowest point is the Orange River Valley at an elevation ranging from 700 mamsl near Kakamas to 800 mamsl at Upington. From the valley the terrain stretches over flat plain to the south with a few Inselbergs dotting the landscape. Elevation is at the highest close to Nieuwehoop at 1 000 mamsl, as the land rises in altitude to the south of the Orange River.

#### 4.4 SOIL AND LAND CAPABILITY

The soils in the study area are derived from the underlain geologies and are mostly red-yellow apedal soils, freely drained with a high base status and < 300 mm deep. Along the Orange River recent alluvial deposit from the river form the main soils forms.

Regionally the Northern Cape is not known for cultivation or high agricultural potential soils. The majority of the province is utilised for grazing of livestock due to the aridity and shallow soils that occur in the area. The site is made up of three land capability classes, namely Class III, VII and VIII. The Class III soils are suitable for cultivation but they have some restrictions – in this case flooding and climate. The Class VII soils have continuing limitations that cannot be corrected; in this case rock complexes, climate, stoniness, and a shallow rooting zone constitute these limitations. Class VIII soils are basically hard rock and have no agricultural use.

#### 4.5 SURFACE WATER

The survey area falls within the Orange River (D) Primary Catchment, within the Lower Orange (14) DWA Water Management Area. The survey area transitions between the Southern Kalahari and Nama Karoo aquatic ecoregions, and falls within the D53C (drained by the Hartbees River) and D73F (drained by the Orange River) quaternary catchments. The main watercourses within the D7 region are classified as an overall C Present Ecological State (PES), which translates to an overall moderately modified ecological state. This is largely due to transformation factors associated with the formal agricultural sector. The major rivers falling within the D5 catchment area are mostly categorised within a B (Largely natural) category. This catchment area is utilised for low density livestock and game farming and therefore has suffered little transformation (SANBI, 2006).

The surface water features in the study area is dominated by the Orange River, which is the largest river in South Africa and also the only perennial river in the study area. There region has a largely arid climate and therefore permanent surface water, and therefore significant aquatic habitat, is relatively rare within the survey area.

#### 4.6 RIPARIAN ZONES

Away from the Orange River, the local watercourses are all rather poorly developed and seasonal in nature. Alluvial and aeolian soils dominate within these watercourses, which are generally coarse grained, unstructured and highly mobile. The soils are also generally desiccated and therefore water percolates readily to underlying soil layers. Actual flow of surface water within these watercourses only occurs during exceptional rainfall periods. Surrounding soils are shallow and extremely rocky. The transport of sediments toward the watercourses results in deeper soils occurring, and also where moisture tends to be retained for longer periods, although not long enough for moisture-dependent riparian vegetation to occur, but rather made up of opportunistic species.

The riparian zones of these watercourses are all therefore poorly developed and made up of a larger proportion of terrestrial species that merely occur in greater densities. Typical species to dominate these zones include *Senegalia* (= *Acacia*) *mellifera*, *Parkinsonia africana*

and *Boscia foetida*. Typically, *Senegalia mellifera* occurs in dense stands along these watercourses as a result of disturbance features brought about through livestock grazing and trampling along the watercourses.

Although regarded as riparian zones, the floral characteristics of these watercourses are not regarded as true riparian zones as the floral community structures largely resemble a terrestrial community structure. Riparian zones function in providing habitat to support biodiversity, root structures of riparian floral species act to anchor and stabilise soils, thereby curbing erosion, it also acts to attenuate surface water runoff prior to it entering into the watercourse as it provides energy dissipation.

#### 4.7 WETLANDS

Wetland units do not feature within the survey area, excepting for seep zones directly associated with the Orange River, together with some floodplain wetland areas that occur along the terraces of the watercourse. Impounded watercourses (farm dams) occur where silt trapping and the settling of fine-grained sand has resulted in a persistence (temporary) of surface water, which has allowed for the establishment of some wetland features.

#### 4.8 TERRESTRIAL ECOLOGY AND BIODIVERSITY

This following section covers the vegetation found from Upington, to Kakamas and south to Kenhardt that is traversed by the routes from Nieuwehoop to the Solar Park.

##### 4.8.1 Vegetation type

**Bushmanland Arid Grassland** comprises the grasslands between the shrublands to the north and east, the desert landscapes to the northwest and Namaqualand hills in the west. These extensive plains are dominated by white grasses mostly of the *Stipagrostis* genus giving the vegetation a semi-desert steppe character. Very little of this vegetation unit has been disturbed and hence the unit is not threatened.

**Lower Gariep Broken Veld** is found along the broken koppies and inselbergs around Keimoes and just before Kakamas as well as a few outcrops to the south. This rugged terrain is sparsely populated with vegetation that is dominated by shrubs with annuals present in spring in the form of perennial grasses and herbs. This vegetation unit is also not threatened as there is less than 1% transformed.

**The Lower Gariep Alluvial Vegetation** is found all along the alluvial floodplains and islands of the Orange River from Groblershoop to the Atlantic Ocean. These alluvial terraces support a variety of riparian thickets dominated by *Ziziphus mucronata*, *Euclea pseudebenus* and *Tamarix usneoides* along with reed beds with *Phragmites australis*. These are mixed with flooded grasslands and herblands on the terraces and banks of the river. This vegetation type has been extensively modified (>50% transformed) through agriculture (grapes and vegetables) and alluvial diamond mining, and is prone to invasion by *Nicotiana glauca* and *Argemone ochroleuca*. It is therefore listed as **endangered**.

#### 4.8.2 **Fauna**

In general the grasslands and shrub plains described above house species that can withstand the arid climate. Common species include the following:

- Mammals: Bat-eared foxes; Steenbok; Scrub hare; Springbok; Aardvark; Meerkat; and Mongoose (variety).
- Reptiles: Puff adder and Leopard tortoise.

In total an estimated 23 mammal, 17 reptile and 39 Arthropods are listed.

#### 4.8.3 **Endangered Ecosystems**

The Lower Gariep Alluvial vegetation adjacent to the Orange River is classified as a threatened ecosystem. Impacting this area requires approval as per the National Environmental Management Act (NEMA, 107 of 1998) Listing 3 Regulations and the National Environmental Management Biodiversity Act (NEM:BA, 10 of 2004).

#### 4.8.4 **Endangered Species**

Further to the endangered ecosystem there is the consideration of protected and endangered species. In terms of the National Environmental Management: Biodiversity Act (NEM: BA, Act 10 of 2004) and the IUCN website the study area could contain the following endangered species:

- *Aloe pillansii* (Bastard Quiver Tree), Status: Critically Endangered
- *Aloe ramosissima* (Maiden's Quiver Tree), Status: Vulnerable
- *Mystromys albicaudatus* (White-tailed Mouse), Status: Endangered
- *Pachypodium namaquanum* (Elephant's Trunk), Status: Lower Risk/near threatened
- *Manis temminckii* (Pangolin), Status: Vulnerable
- *Panthera pardus* (Leopard), Status: Vulnerable

### 4.9 **AVIFAUNA**

#### 4.9.1 **Eastern Kalahari Bushveld**

This habitat class is of importance for a variety of Red Data power line sensitive species. The Eastern Kalahari Bushveld is particularly rich in large raptors, and in the study area it forms the stronghold of Red Data species such as White-backed Vulture *Gyps africanus*, Martial Eagle *Polemaetus bellicosus*, Tawny Eagle *Aquila rapax*, Bateleur *Terathopius ecaudatus* and Lappet-faced Vulture *Torgos tracheliotis*. All these species require large trees for breeding and roosting, and the multitude of large *Acacia erioloba* trees is ideal for that purpose.

Cape Vulture *Gyps coprotheres* may also occur sparsely, although they do not breed in the area. Apart from Red Data species, it also supports several non-Red Data large raptor



species, such as the Brown Snake Eagle *Circaetus cinereus*, Black-chested Snake Eagle *Circaetus pectoralis*, and in mountainous habitat (such as the Langeberg near Olifantshoek), Verreaux's Eagle *Aquila verreauxii*. A multitude of smaller raptor species also occur in Eastern Kalahari Bushveld, as well as the large terrestrial Red Data Secretarybird *Sagittarius serpentarius* and Kori Bustard *Ardeotis kori*. Potential impacts that could result due to the power line in this habitat are collisions with the earthwire (Secretarybird and Kori Bustard) and displacement of breeding raptors and vultures due to habitat destruction.

#### **4.9.2 Kalahari Duneveld**

This habitat class is also of importance for the same suite of power line sensitive species described under above. However, the scarcity of large trees means that large breeding raptors and vultures are more sparsely distributed. The habitat is very suitable for Secretarybird, as the species generally breeds in small trees and forages in open duneveld. Kori Bustard is also common in this habitat, while Ludwig's Bustard *Neotis ludwigii* occurs sporadically. Black Harrier *Circus maurus* occurs sparsely as a non-breeding migrant. The major expected impact in this habitat is collisions with the earthwire (Secretarybird, Kori Bustard and Ludwig's Bustard), and to a lesser extent displacement due to disturbance and habitat destruction.

#### **4.9.3 Bushmanland**

The Karoo vegetation types support a particularly high diversity of bird species endemic to Southern Africa, particularly in the family Alaudidae (Larks) (Harrison *et al* 1997). Its avifauna typically comprises ground-dwelling species of open habitats. Many typical karroid species are nomads, able to use resources that are patchy in time and space, especially enhanced conditions associated with rainfall (Barnes 1998). Power line sensitive Red Data species associated with Bushmanland are mainly large terrestrial species, in particular the nomadic Ludwig's Bustard, which may occur in flocks following rainfall events, and to a lesser extent Kori Bustard. Martial Eagle and Black-chested Snake-Eagle occurs sparsely. Koppies and inselbergs provide breeding habitat for Lanner Falcon *Falco biarmicus*, Peregrine Falcon *Falco peregrinus*, Verreauxs Eagle *Aquila verreauxii* and Black Stork *Ciconia nigra*. Black Harrier *Circus maurus* occurs sparsely as a non-breeding migrant. The major envisaged impact is collisions with the earthwire (mainly large terrestrial species).

#### **4.9.4 Water bodies and rivers**

Water bodies and rivers are of specific importance to a variety of Red Data power line sensitive species in this arid study area. The perennial Orange River flows through the study area, and the river channel, pools of water and riverine islands with riparian thickets, reed beds, flooded grasslands and sandbanks provide habitat for a multitude of water birds, including the Red Data Black Stork *Ciconia nigra*. The non-Red Data African Fish-Eagle *Haliaeetus vocifer* occurs commonly along the river. Pans are endorheic wetlands having closed drainage systems; water usually flows in from small catchments but with no outflow from the pan basins themselves. They are characteristic of poorly drained, relatively flat and dry regions. Water loss is mainly through evaporation, sometimes resulting in saline

conditions, especially in the most arid regions. Water depth is shallow (<3m), and flooding characteristically ephemeral (Harrison *et al.* 1997). Pans are important for a variety of non-Red Data water birds, and in the study area specifically for the Red Data Greater Flamingo *Phoenicopterus roseus* and Lesser Flamingo *Phoenicopterus minor*. Pans, dams and pools of water with exposed sandbanks are also used by large raptors for drinking and bathing. Ephemeral drainage lines are also corridors for woodland, which Kori Bustard often associate with, and occasionally, after good rains when pools form in the channels, it act as a draw card for water birds. During such times, small birds are attracted to the water, which in turn may attract Lanner Falcons and other raptors. The major envisaged impact is collisions with the earthwire (water birds and to a lesser extent raptors). Boreholes are also important sources of surface water and water troughs are used extensively by various species, including large raptors and vultures, to drink and bath.

#### **4.9.5 Transmission lines**

Transmission lines are an important roosting and breeding substrate for large raptors in the study area. Existing transmission lines are used extensively by large raptors e.g. in 2005 the author did an aerial survey of the Ferrum – Garona 275 kV line together with Eskom, and found a total of 19 Martial Eagle and 7 Tawny Eagle nests on transmission line towers (Van Rooyen 2007). Transmission lines therefore hold a special importance for large raptors. Should any new lines be constructed next to existing lines, the construction activities could lead to temporary displacement of breeding eagles, resulting in breeding failure in a particular season, or even permanent abandonment of a breeding territory.

#### **4.9.6 Low impact areas**

The proposed corridors run through several types of habitat which would generally not attract power line sensitive Red Data species. For purposes of the analysis, these have all been grouped together under low impact areas. These are degraded areas, mines, urban/industrial areas, agricultural areas along the Orange River (mostly irrigated vineyards) and major roads. No significant impacts on power line sensitive Red Data species are expected in these areas.

### **4.10 SOCIO-ECONOMIC IMPACT ASSESSMENT**

#### **4.10.1 Farmers**

All the proposed routes cross farming areas. There are different commodities that are farmed. A significant part of the study area comprises livestock farmers. Some of the farmers breed with the stock, whilst others produce animals for the food market.

There are a few game farmers in the area. Game farms usually get their revenue from tourism, hunting or speculation with game. Game capture is often done by helicopter – the helicopters fly low and herd the game into capture areas. Sense of place, or a feeling of undisturbed nature is important for tourists visiting game farms to view game or to hunt.

There are also irrigation farmers in the area, especially around the Orange River. A number of the farmers farm with a combination of commodities. Crops include grapes (export, wine, raisins) and citrus. One of the biggest issues for this stakeholder group is access control and safety/security issues.

#### **4.10.2 Industry**

Economic activities in the study area are mainly concentrated in the mining and agricultural industry. The Sishen Mine falls in the study area for the Solar to Ferrum lines. It is one of the largest mines in South Africa, and part of the motivation for the project is that the mine want to increase its iron ore exports and therefore the existing railway line would need to be upgraded.

#### **4.10.3 Vulnerable communities:**

The first group of vulnerable people to consider is the **farm workers**. Due to the historical process that created the farm-worker class, farm workers have become one of the most subjugated and marginalised sectors of the South African society.

Many of the proposed alternative routes also traverse **traditional areas** governed by traditional authorities. The Griqua and the San are two minority groups that reside in the area.

There are a number of **small settlements** in the study area. The people living in these settlements are poor and often “forgotten” by the government. There are no or limited activities in these settlements, and often existing social pathology like gender violence, alcoholism and drug abuse. These communities are very vulnerable to influences from outside the area and impacts traditionally associated with construction workers.

#### **4.10.4 Surrounding towns**

The proposed power lines may affect a number of towns. The biggest impact on these towns will be during the construction phase and will be associated with pressure on infrastructure and deviant social behavior. There may also be positive social impacts associated with the construction phase.

#### **4.10.5 Tourism**

The project area includes several scenic places that are well known for their attraction to tourists. The tourism industry in the area is developed around the sense of place, natural beauty and natural resources. One of the concerns is the visual impact of the proposed line on the livelihoods of owners of tourism establishments. There may also be a positive impact on the tourism industry in the construction phase when contractors look for temporary accommodation.

### **4.11 ARCHAEOLOGICAL, CULTURAL AND HISTORICAL**

The Northern Cape was one of three provinces carved out of the Cape Province in 1994, the others being Western Cape to the south and Eastern Cape to the southeast. Politically, it had

been dominated since 1994 by the African National Congress (ANC). Ethnic issues are important in the politics of the Northern Cape. For example, it is the site of the controversial Orania settlement, whose leaders have called for a Volkstaat for the Afrikaner people in the province.

The Northern Cape is also the home of over 1,000 San who immigrated from Namibia following the independence of the country; they had served as trackers and scouts for the South African government during the war.

The precolonial history of the Northern Cape is reflected in a rich, mainly Stone Age, archaeological heritage. Cave sites include Wonderwerk Cave near Kuruman, which has a uniquely long sequence stretching from the turn of the twentieth century at the surface to more than 1 million (and possibly nearly 2 million) years in its basal layer (where stone tools, occurring in very low density, may be Oldowan).

Many sites across the province, mostly in open air locales or in sediments alongside rivers or pans, document Earlier, Middle and Later Stone Age habitation. From Later Stone Age times, mainly, there is a wealth of rock art sites – most of which are in the form of rock engravings such as at Wildebeest Kuil and many sites in the area known as IXam-ka kau, in the Karoo. They occur on hilltops, slopes, rock outcrops and occasionally (as in the case of Driekops Eiland near Kimberley), in a river bed.

In the north eastern part of the province there are sites attributable to the Iron Age such as Dithakong. Environmental factors have meant that the spread of Iron Age farming westwards (from the 17th century – but dating from the early first millennium AD in the eastern part of South Africa) was constrained mainly to the area east of the Langeberg Mountains, but with evidence of influence as far as the Upington area in the eighteenth century.

From that period the archaeological record also reflects the development of a complex colonial frontier when precolonial social formations were considerably disrupted and there is an increasing 'fabric heavy' imprint of built structures, ash-heaps, and so on. The copper mines of Namaqualand and the diamond rush to the Kimberley area resulted in industrial archaeological landscapes in those areas which herald the modern era in South African history.

All archaeological traces in the Northern Cape that are greater than 100 years old are automatically protected by the South African Heritage Resources Act, while some are formally protected by declaration as either Provincial Heritage Sites (e.g. Wildebeest Kuil and Nooitgedacht) or National Heritage Sites (e.g. Wonderwerk Cave). The archaeology of the Richtersveld is part of the universal cultural value recognised in the area's listing as a World Heritage Site, while sites included on South Africa's Tentative List for World Heritage inscription include Wonderwerk Cave and the IXam and #Khomani heartland.

---

## 5 AUTHORISED SOLAR PARK TO NIEUWEHOOP SERVITUDE

---

### 5.1 AUTHORISED PREFERRED ALTERNATIVES:

The authorised Solar Park to Nieuwehoop substation alternative, in terms of the Final EIR submitted to the competent authority for decision-making, is *Nieuwehoop\_Alternative 3B*. This alternative proposes the powerline runs from the CSP north-eastward and cross the Orange River. When the powerlines reach the R359 it turns southwards, and continues southward up to an existing dirt road. From here it follows the dirt road to the Nieuwehoop Substation.

The Solar Park substation alternative 6 was authorised as the preferred Solar Park substation alternative.

*Road Relocation\_Alternative 1* was authorised as the preferred road relocation alternative. The existing D3279 will be relocated to the western direction of the property. The intersection of D3279 and the N14 is relocated approximately 5 km to the west of the N14. From the new intersection the new D3279 will proceed in the north-western direction for approximately 13 km and then slightly curve to the north-east direction where it joins the existing D3279 road inside the Eskom property.

### 5.2 SERVITUDE NEGOTIATIONS

Eskom has undertaken successful servitude negotiations with all affected landowners subsequent to the Environmental Authorisation being issued by the Department of Environmental Affairs (DEA) on 17 February 2014. Based on the successful negotiations optimised preliminary placement of power line infrastructure was undertaken subsequent to the corridor walk-downs by relevant specialists, Eskom technical team and Environmental Assessment Practitioner (EAP). Affected land owners and properties, and proposed tower infrastructure is provided in Table 5-1 and represented graphically on **Error! Reference source not found.** below.

Once the servitude negotiations were completed, the corridor walk-down preparation commenced.

**Table 5-1: Tower locations, affected land owners and land portions**

<b>Tower No.</b>	<b>Latitude (DMS)</b>	<b>Longitude (DMS)</b>	<b>Farm portion</b>	<b>Land Owner</b>	<b>Date of walk-down assessment</b>
T0	28°32'43.17" S	21°08'18.75" E	Olyvenhouts Drift	Eskom Holdings SOC Ltd	20-Oct-2015
T1	28°32'41.79" S	21°08'20.67" E			
T2	28°32'31.77" S	21°08'32.41" E			
T3	28°32'19.58" S	21°08'46.69" E			
T4	28°32'06.98" S	21°09'01.45" E			
T5	28°31'55.64" S	21°09'14.74" E			
T6	28°31'46.08" S	21°09'25.94" E			
T7	28°31'37.84" S	21°09'35.59" E			
T8	28°31'26.52" S	21°09'40.03" E	Klipkraal 451/0	Khara Hais LM	20-Oct-2015
T9	28°31'12.95" S	21°09'45.36" E			
T10	28°31'11.85" S	21°09'49.78" E			
T11	28°30'59.36" S	21°09'54.67" E			
T12	28°30'46.05" S	21°09'59.89" E			
T13	28°30'35.01" S	21°10'04.21" E	Klipkraal 451/25	Mr. Rupert Steenkamp	20-Oct-2015
T14	28°30'26.77" S	21°10'09.80" E			
T15	28°30'20.19" S	21°10'14.24" E	Klipkraal 451/22	Mr. Chris Louw	20-Oct-2015
T16	28°30'17.42" S	21°10'25.94" E			
T17	28°30'14.25" S	21°10'39.28" E	Klipkraal 451/25	Mr. Rupert Steenkamp	20-Oct-2015
T18	28°30'11.61" S	21°10'50.42" E	Klipkraal 451/16	Mr. Barend Louw	20-Oct-2015
T19	28°30'17.21" S	21°11'09.57" E			
T20	28°30'21.06" S	21°11'22.73" E	Bethesda 38/104	Mr. Apie Khun	20-Oct-2015
T21	28°30'23.29" S	21°11'30.37" E	Bethesda 38/193	Mr. Apie Khun	20-Oct-2015
T22	28°30'28.37" S	21°11'37.75" E	Bethesda 38/346	Mr. Apie Khun	20-Oct-2015
T23	28°30'33.28" S	21°11'44.89" E			
T24	28°30'38.10" S	21°11'51.90" E	Bethesda 38/345	Mr. Apie Khun	21-Oct-2015
T25	28°30'45.08" S	21°12'06.61" E			
T26	28°30'57.99" S	21°12'16.07" E	Bethesda 38/1	Khara Hais LM	21-Oct-2015
T27	28°31'12.33" S	21°12'26.58" E			
T28	28°31'22.57" S	21°12'34.09" E			
T29	28°31'34.30" S	21°12'42.69" E			
T30	28°31'43.41" S	21°12'49.37" E	Bethesda 38/279	Mr. Daniel Malan	21-Oct-2015
T31	28°31'47.42" S	21°12'58.29" E			
T32	28°31'52.64" S	21°13'09.86" E	Jannelsepan 39/0	Louisvale Irrigation Board	21-Oct-2015
T33	28°32'04.64" S	21°13'19.40" E			
T34	28°32'16.36" S	21°13'28.71" E			
T35	28°32'28.18" S	21°13'38.11" E			
T36	28°32'41.65" S	21°13'48.83" E			
T37	28°32'55.98" S	21°14'00.22" E			23-Oct-2015
T38	28°33'10.52" S	21°14'11.78" E			
T39	28°33'24.73" S	21°14'23.08" E			
T40	28°33'39.07" S	21°14'34.49" E			
T41	28°33'53.79" S	21°14'46.19" E			
T42	28°34'08.64" S	21°14'58.00" E			22-Oct-2015
T43	28°34'23.42" S	21°15'09.76" E			
T44	28°34'36.29" S	21°15'20.00" E			
T45	28°34'46.76" S	21°15'28.34" E			
T46	28°34'59.20" S	21°15'27.36" E			
T47	28°35'17.43" S	21°15'25.94" E	Bethesda 38/255	Mr. Rupert Steenkamp	22-Oct-2015
T48	28°35'34.66" S	21°15'24.59" E			
T49	28°35'53.07" S	21°15'23.15" E			
T50	28°36'09.31" S	21°15'21.88" E			
T51	28°36'27.19" S	21°15'20.48" E			
T52	28°36'45.58" S	21°15'19.04" E			
T53	28°36'58.55" S	21°15'18.02" E			

Tower No.	Latitude (DMS)	Longitude (DMS)	Farm portion	Land Owner	Date of walk-down assessment
T54	28°37'17.09" S	21°15'16.57" E	Bethesda 38/255	Mr. Rupert Steenkamp	22-Oct-2015
T55	28°37'33.91" S	21°15'15.25" E			
T56	28°37'46.37" S	21°15'25.61" E			
T57	28°38'00.82" S	21°15'37.62" E			
T58	28°38'14.82" S	21°15'49.26" E			
T59	28°38'29.40" S	21°16'01.38" E			
T60	28°38'43.30" S	21°16'12.94" E			
T61	28°38'57.06" S	21°16'24.39" E			
T62	28°39'11.02" S	21°16'36.00" E			
T63	28°39'25.09" S	21°16'47.70" E			
T64	28°39'39.34" S	21°16'59.55" E			
T65	28°39'53.74" S	21°17'11.53" E	Bethesda 38/295	Mr. HJ Koortzen	21-Oct-2015
T66	28°40'06.10" S	21°17'21.82" E			
T67	28°40'19.09" S	21°17'22.74" E	Rateldraai 54/15	Mr. Rupert Steenkamp	21-Oct-2015
T68	28°40'35.19" S	21°17'23.88" E			
T69	28°40'52.69" S	21°17'25.13" E			22-Oct-2015
T70	28°41'09.99" S	21°17'26.36" E			
T71	28°41'28.20" S	21°17'27.65" E			
T72	28°41'46.23" S	21°17'28.94" E			
T73	28°42'04.29" S	21°17'30.22" E			
T74	28°42'22.26" S	21°17'31.50" E			
T75	28°42'40.00" S	21°17'32.76" E			
T76	28°42'57.82" S	21°17'34.03" E			
T77	28°43'15.25" S	21°17'35.27" E			
T78	28°43'33.18" S	21°17'36.54" E			
T79	28°43'50.90" S	21°17'37.80" E			
T80	28°44'08.87" S	21°17'39.08" E			
T81	28°44'27.11" S	21°17'40.38" E			
T82	28°44'44.39" S	21°17'41.61" E			
T83	28°45'02.06" S	21°17'42.87" E			
T84	28°45'19.43" S	21°17'44.11" E			
T85	28°45'37.52" S	21°17'45.39" E			
T86	28°45'55.66" S	21°17'46.69" E			
T87	28°46'11.86" S	21°17'47.84" E			23-Oct-2015
T88	28°46'29.65" S	21°17'49.11" E			
T89	28°46'46.70" S	21°17'50.32" E			
T90	28°47'01.26" S	21°17'51.36" E			
T91	28°47'13.56" S	21°17'52.23" E			
T92	28°47'26.42" S	21°17'58.56" E			
T93	28°47'42.76" S	21°18'06.60" E			
T94	28°47'59.16" S	21°18'14.66" E			
T95	28°48'15.39" S	21°18'22.65" E			
T96	28°48'31.70" S	21°18'30.67" E	Rateldraai 54/13	Mrs. Joy Grinstead	23-Oct-2015
T97	28°48'46.82" S	21°18'38.12" E			
T98	28°49'02.66" S	21°18'45.91" E			
T99	28°49'19.39" S	21°18'54.14" E			
T100	28°49'35.45" S	21°19'02.05" E			
T101	28°49'49.85" S	21°19'09.14" E	Klipbakken 110/1	Mr. Peter Connan	27-Oct-2015
T102	28°50'03.73" S	21°19'19.82" E			
T103	28°50'17.98" S	21°19'30.79" E			
T104	28°50'32.29" S	21°19'41.81" E			
T105	28°50'46.74" S	21°19'52.92" E			23-Oct-2015
T106	28°50'59.87" S	21°20'03.03" E			
T107	28°51'14.71" S	21°20'14.46" E			
T108	28°51'29.04" S	21°20'25.49" E			
T109	28°51'40.96" S	21°20'34.67" E			

Tower No.	Latitude (DMS)	Longitude (DMS)	Farm portion	Land Owner	Date of walk-down assessment
T110	28°51'52.27" S	21°20'43.38" E	Klipbakken 110/1	Mr. Peter Connan	23-Oct-2015
T111	28°52'07.38" S	21°20'50.05" E	Klip Koppies 109/0	Mr. Albert van Niekerk	24-Oct-2015
T112	28°52'20.53" S	21°20'55.86" E			
T113	28°52'36.40" S	21°21'02.87" E			
T114	28°52'50.96" S	21°21'09.29" E			
T115	28°53'01.99" S	21°21'14.17" E			
T116	28°53'15.74" S	21°21'18.62" E			
T117	28°53'32.62" S	21°21'24.09" E			
T118	28°53'49.13" S	21°21'29.44" E			
T119	28°54'06.34" S	21°21'35.01" E			
T120	28°54'23.33" S	21°21'40.52" E			
T121	28°54'40.15" S	21°21'45.97" E			
T122	28°54'57.54" S	21°21'51.60" E			
T123	28°55'12.80" S	21°21'56.55" E			
T124	28°55'28.20" S	21°22'01.54" E			
T125	28°55'45.39" S	21°22'07.11" E			
T126	28°56'02.74" S	21°22'12.74" E			
T127	28°56'19.53" S	21°22'18.18" E			
T128	28°56'36.68" S	21°22'23.74" E			
T129	28°56'53.93" S	21°22'29.33" E			
T130	28°57'11.33" S	21°22'34.98" E			
T131	28°57'27.67" S	21°22'40.28" E			
T132	28°57'41.45" S	21°22'44.75" E			
T133	28°57'51.80" S	21°22'48.10" E	Smutshoek 395/0	Mr. Ernest Connan	24-Oct-2015
T134	28°58'06.42" S	21°22'44.64" E			
T135	28°58'24.05" S	21°22'40.47" E			
T136	28°58'41.51" S	21°22'36.33" E			
T137	28°58'58.86" S	21°22'32.22" E			
T138	28°59'16.35" S	21°22'28.08" E			
T139	28°59'33.67" S	21°22'23.97" E			
T140	28°59'50.89" S	21°22'19.89" E			
T141	29°00'08.27" S	21°22'15.78" E			
T142	29°00'25.25" S	21°22'11.75" E			
T143	29°00'43.18" S	21°22'07.50" E			
T144	29°01'00.51" S	21°22'03.39" E			26-Oct-2015
T145	29°01'18.04" S	21°21'59.24" E			
T146	29°01'35.33" S	21°21'55.14" E			
T147	29°01'53.02" S	21°21'50.95" E			
T148	29°02'10.41" S	21°21'46.82" E	Witdorp 394/0	Mr. Piet Karsten	26-Oct-2015
T149	29°02'27.86" S	21°21'42.68" E	Smutshoek 395/0	Mr. Ernest Connan	26-Oct-2015
T150	29°02'44.15" S	21°21'38.82" E			
T151	29°03'01.65" S	21°21'34.67" E			
T152	29°03'15.09" S	21°21'31.48" E			
T153	29°03'33.88" S	21°21'27.03" E			
T154	29°03'45.02" S	21°21'33.09" E	Gemsbok Bult 120/9	Mr. Ernest Connan	26-Oct-2015
T155	29°04'02.03" S	21°21'42.35" E			
T156	29°04'17.75" S	21°21'50.90" E			
T157	29°04'31.21" S	21°21'58.23" E			
T158	29°04'47.73" S	21°22'07.22" E			
T159	29°04'59.14" S	21°22'13.43" E			
T160	29°05'07.64" S	21°22'18.06" E	Gemsbok Bult 120/5	Mr. Piet Karsten	26-Oct-2015
T161	29°05'20.31" S	21°22'15.91" E			
T162	29°05'25.56" S	21°22'10.49" E	Gemsbok Bult 120/3	Mr. Sarel Strauss	26-Oct-2015
T163	29°05'38.34" S	21°21'57.31" E			
T164	29°05'50.95" S	21°21'44.30" E			
T165	29°06'03.11" S	21°21'31.75" E			



Tower No.	Latitude (DMS)	Longitude (DMS)	Farm portion	Land Owner	Date of walk-down assessment
T166	29°06'15.52" S	21°21'18.95" E	Gemsbok Bult 120/3	Mr. Sarel Strauss	26-Oct-2015
T167	29°06'28.54" S	21°21'05.51" E			
T168	29°06'41.44" S	21°20'52.20" E			
T169	29°06'52.84" S	21°20'40.43" E			
T170	29°07'04.85" S	21°20'28.03" E			
T171	29°07'17.94" S	21°20'14.52" E			
T172	29°07'30.84" S	21°20'01.20" E			
T173	29°07'43.78" S	21°19'47.84" E			
T174	29°07'56.32" S	21°19'34.89" E			
T175	29°08'09.88" S	21°19'20.88" E			
T176	29°08'20.04" S	21°19'10.39" E			
T177	29°08'30.68" S	21°19'06.11" E			
T178	29°08'38.98" S	21°19'02.77" E			
T179	29°08'50.19" S	21°19'10.57" E			
T180	29°09'00.61" S	21°19'17.82" E			
T181	29°09'00.57" S	21°19'36.06" E			
T182	29°09'00.53" S	21°19'51.70" E			
T183	29°09'00.49" S	21°20'08.42" E			
T184	29°09'00.90" S	21°20'11.74" E			
T185	29°09'00.64" S	21°20'13.74" E			

### 5.3 CORRIDOR WALK-DOWN

#### 5.3.1 Introduction

A corridor walk-down was undertaken from 19 to 27 October 2015 from the Solar Park substation to the newly constructed Nieuwehoop substation approximately 75km to the south of the Eskom Solar Park CSP site on the farm Klipkraal.

#### 5.3.2 Legal requirements

The legal requirement for the walk-down stems from specific conditions 24 to 28 in the Environmental Authorisation issued on 17 February 2014 by the DEA. These conditions stipulate that a heritage, avifauna and botanical walk-down must be undertaken of the route in order to identify sensitivities within the servitude that must be avoided or impacts that must be mitigated.



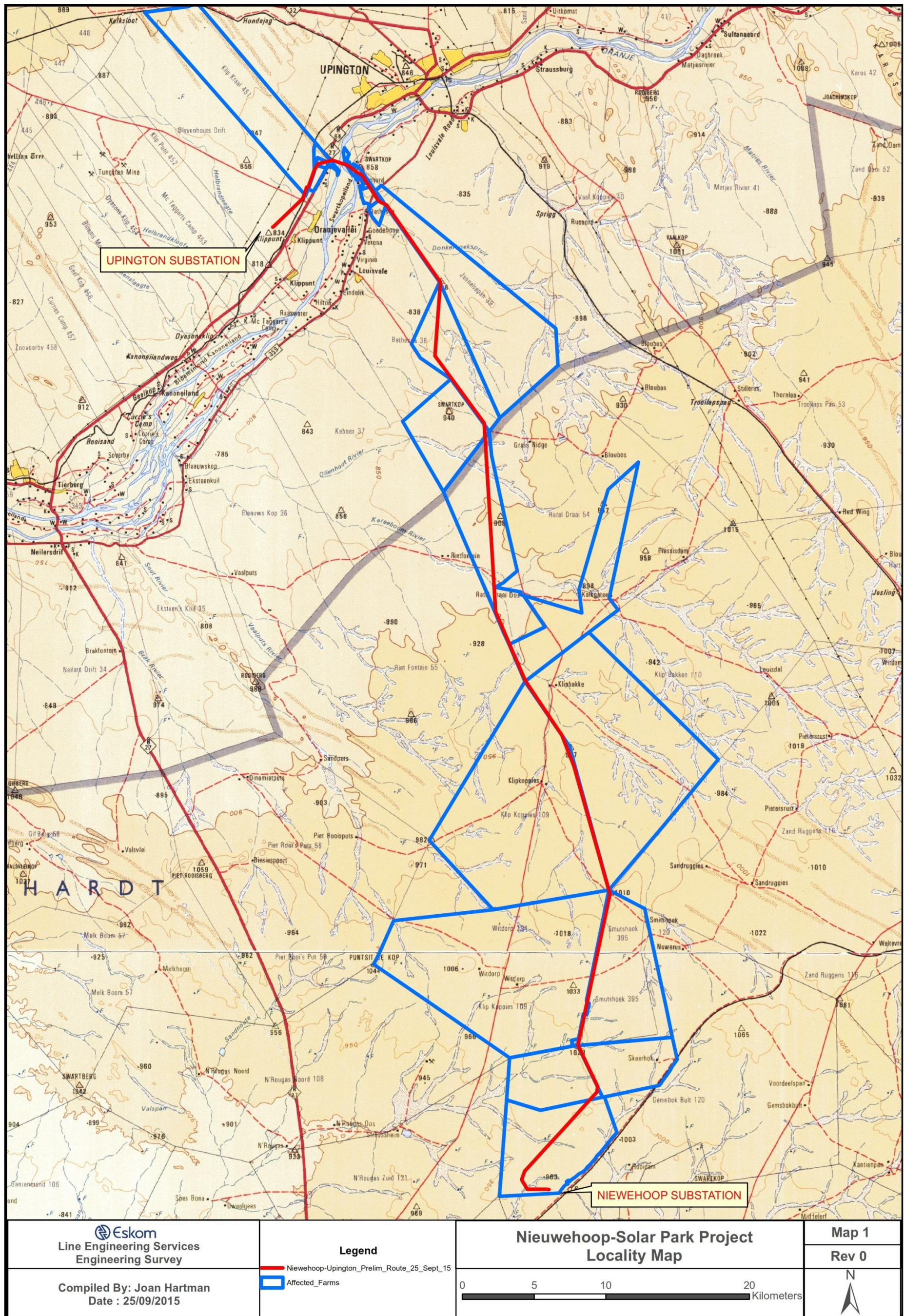


Figure 5-1: Solar Park to Nieuwehoop 400kV locality map



### **5.3.3 Objective of the walk-down**

The objective of the walk-down was to visit all the proposed tower locations (185 tower positions) in order to:

- Identify any sensitive heritage resources/features that must be avoided or mitigated
- Identify possible raptor nests within 1 km of the proposed tower location;
- Identify power line spans that must be fitted with bird flight diverters;
- Identify any protected or endangered plant species that must be avoided or relocated;
- Identify relevant relocation permits to remove or relocate protected or endangered plant species;
- Identify tower locations that must be moved to avoid sensitivities and appropriate recommendations; and
- Identify and mitigate any other sensitivity encountered within the tower footprint or servitude.

### **5.3.4 Walk-down team**

- Mr. Mikeshen Gounden – LES Eskom (Line Designer);
- Mr. Mfundo Maphanga – Environmental Management Eskom (Senior advisor);
- Mr. Witness Koliwe – Northern Cape Grid, Transmission Eskom (Senior supervisor);
- Mr. Andreas Le Roux – Heritage specialist;
- Mr. Jamie Pote – Botanical specialist;
- Ms. Megan Diamond – Avifaunal specialist;
- Dr. Mathys Vosloo – Zitholele Consulting (EAP); and
- Mr. Collin Schoeman – TAP (Construction contractor).

### **5.3.5 Walk-down procedure**

The following procedure was followed during the walk-down assessment:

- The teams physically walked, or where terrain permitted was transported along the identified servitude to each tower location;
- Each tower position was inspected and the tower footprint area assessed and photographed;
- Any surrounding features or sensitivities were assessed, recorded and photographed, where possible;
- A team discussion between the specialists, Eskom technical team and EAP was undertaken at each site to discuss sensitivities and recommendation where moving of the tower position was required to avoid sensitivities;
- A walk-down report and table with final tower positions and numbers was compiled and the proposed mitigation measures were indicated on a per tower basis.

The heritage resources, avifaunal and botanical sensitivities are documented in the respective walk-down reports for each specialist and are included as Appendix B to this EMP.

### **5.3.6 Botanical (ecological) walk-down findings and management measures**

The vegetation types that occur in 400kV power line servitude include Kalahari Karroid Shrubland (Not Threatened), Bushmanland Arid Grassland (Not Threatened) and Lower Gariep Alluvial Vegetation (Endangered).

Endangered species that could be encountered in the power line servitude include:

- *Aloe pillansii* (Bastard Quiver Tree): Status: Critically Endangered
- *Aloe ramosissima* (Maiden's Quiver Tree): Status: Vulnerable
- *Pachypodium namaquanum* (Elephant's Trunk) : Status: Lower risk/near threatened
- *Mystromys albicaudatus* (White-tailed Mouse): Status: Endangered
- *Manis temminckii* (Pangolin): Status: Vulnerable
- *Panthera pardus* (Leopard): Status: Vulnerable

Protected species, in terms of NEM:BA regulations, DAFF list of protected species and Northern Cape Nature Conservation Act (Act no. 9 of 2009), that are likely to occur in the power line servitude include:

- *Acacia erioloba* (Camel Thorn, Kameeldoring)
- *Acacia haematoxylon* (Grey Camel Thorn, Vaalkameeldoring)
- *Boscia albitrunca* (Shepherd's tree, Witgat)
- *Euclea pseudobenus* (Ebony tree, Ebbeboom)
- *Olea europaea* subsp. *africana* (Wild Olive, Olienhout)

Potential impacts considered include:

1. Damage or destruction of protected or endangered species
2. Adverse impacts on sensitive ecological habitats such as rocky outcrops, drainage lines and pans

Sensitivities and recommendations made by the botanical specialist has been summarised in Table 5-2 below.

A significance rating based on the potential and magnitude of the impact on the sensitive features are also provided in Table 5-2, including a motivation for the proposed impact rating.

**Table 5-2: Botanical sensitivities and recommendation per tower location**

Tower no	Feature / sensitivity	Comment / Recommendation / Mitigation	Impact significance	Impact significance motivation
T1	Presence of limestone outcrop within footprint	Move tower position 15 to 20m south	Low	Tower position moved to minimise impact on limestone outcrop
T25, T47, T101, T153	Presence of rocky outcrop outside tower footprint and servitude	Avoid outcrop through designated No-Go area	Low	Sensitive areas avoided through management of No-Go areas
T24, T84, T85, T86, T28, T29, T32, T33, T34, T52	Presence of succulents, aloes and other sensitive plant species, and rocky refugia for fauna within servitude	Relocate protected/endangered fauna and flora if necessary. Relevant permits required.	Low	Relocation of affected species only to nearby suitable habitat. Re-establishment of individual plants likely.
T27, T31	Acacia species and tall trees located along river and in servitude	Trees require pruning, no permits required	Low	Trees only pruned, i.e. existence of trees not jeopardised.
T46, T54, T55, T56, T64, T65, T164, T165, T166, T167, T175, T176	Quiver trees or tree stump in vicinity of the tower sites, inside or outside servitude footprint	Avoid impact to Quiver trees through designated No-Go areas	Low	All incidences of protected Quiver trees recorded can be avoided during construction. Sensitive areas avoided through management of No-Go areas
T48, T135, T149, T150, T151, T155	Drainage line in vicinity of tower sites, but outside servitude footprint	Avoid impact on drainage line through designated No-Go areas	Low	Sensitive areas avoided through management of No-Go areas
T69	Tower site on alluvial fan	Move tower to nearby slope	Low	Tower is moved away from sensitive site
T113, T131, T132	Protected Shepherd's tree in vicinity of the tower sites, inside or outside servitude footprint	Avoid damage or interference to protected trees through Designated No-Go site	Low	All incidences of protected Quiver trees recorded can be avoided during construction. Sensitive areas avoided through management of No-Go areas
T133, T159	In vicinity of wetland pan	Avoid impact on pans through designated No-Go areas. Move tower location where required	Low	Sensitive areas avoided through management of No-Go areas

**Site-specific management and mitigation during construction and operational phase include:**

1. Move tower position that has been identified and recommended by walk-down specialists in order to minimise impact on site sensitivities that has been identified during the corridor walk-down.
2. Avoid rocky outcrops through establishing and designating No-Go areas, where relevant and required.
3. Relocate protected/endangered fauna and flora, if necessary. Relocation must be undertaken by a botanical specialist or appropriately qualified professional. Relevant permits must be obtained prior to relocation.
4. Tall trees identified within the servitude should be pruned where possible.
5. Avoid impact to all protected tree species (Quiver trees, Shepard's tree) through designating No-Go areas.

6. Avoid impact on drainage lines, pans or dams through designating No-Go areas.

### **5.3.7 Avifaunal walk-down findings and management measures**

The following impacts were considered by the avifaunal specialist:

1. Bird mortality due to collisions with the earthwire

The most obvious candidates for collision mortality on the Nieuwehoop Upington 400kV power line are Ludwig's Bustards followed by Kori Bustards. For Ludwig's Bustard (observed during the walk through), this risk is particularly relevant in Nama-Karoo, as that is the preferred habitat for the species. Ludwig's Bustard is highly vulnerable to power line collisions, based on the species flight characteristics and tendency to fly long distances between foraging and roosting areas and when migrating.

Kori Bustards and Secretarybird (both observed during the walk through) are also likely candidates for collisions, particularly in the Kalahari Duneveld, where the species are likely to be most numerous. The highest risk for Black Stork and other water fowl will be where the alignment crosses the Orange River. Flamingos might be at risk near water bodies, particularly pans. Water reservoirs are draw cards for a variety of birds, including large raptors, and may therefore expose them to collision risk if it is situated close to the alignment.

2. Displacement due to habitat destruction

Relevant to this study, the most sensitive areas are the riparian habitats associated with the Orange River and the various spruit and drainage line crossings along the route alignment.

3. Potential Disturbance of breeding African Fish-Eagles;

African Fish-Eagles are reported to be breeding by landowners in the general vicinity of towers 18 to 22. Although no nest was identified during the walk through, given the availability of suitable riparian vegetation, it is plausible and highly likely that the birds are nesting and roosting in the vicinity of the aforementioned towers, and are certainly fishing close to the proposed river crossing for the power line.

4. Potential impact to tower structure due to nesting and breeding activity

As this is a positive impact on the bird species in the area, no mitigation is recommended. However it must be noted that nesting material could compromise the structural integrity of the tower (i.e. Ferrum Garona 275kV power line, where temporary backstays have been installed to support the towers) and cause faulting as it intrudes into the air gap causing equipment damage and loss of supply.

5. Impact on the quality of electrical supply due to faecal pollution.

Both bird streamers and bird pollution occur as a result of birds perching on towers, often directly above live conductors. The Nieuwehoop-Upington 400kV power line will be

constructed using a cross rope suspension structure type and as a result, streamer and faecal pollution induced faulting through conventional faulting mechanisms is highly unlikely. This impact is therefore insignificant and therefore no mitigation is recommended for this structure type. However, with regards to the strain towers and other self-supporting intermediate structures, streamer and pollution induced faulting is possible.

All recommended mitigation measures has been included in section and a summary of the findings, impacts and recommendations from the avifaunal walk-down is provided in table below.

**Table 5-3: Avifaunal sensitivities and recommendation per tower location**

Tower No.	Impact	Feature / sensitivity	Comment / Recommendation / Mitigation	Impact significance	Impact significance motivation
All towers	Bird mortality due to collision or electrocution	Presence of power line and tower infrastructure in the landscape	Post construction monitoring for period of 3 years	Medium	Post construction monitoring is reactive mitigation will not avoid bird mortality in the short to medium term. Identified hotspots can be further mitigated to reduce bird mortalities in the medium to long term.
T3 to T5, T13 to T14 T22 to T23 T26 to T27 T29 to T32 T35 to T38 T52 to T55 T67 to T74 T77 to T79 T84 to T89 T95 to T96 T98 to T99 T102 to T103 T131 to T134 T147 to T155 T158 to T160 T169 to T171 T175 to T180 T182 to T183	Bird mortality due to collision or electrocution	Presence of agricultural land, drainage line, water reservoir, dam or pan close to power line or tower locations	Installation of bird flight diverters along identified spans.	Low	Installation of bird flight diverters are expected to significantly prevent bird collisions and mortality along the fitted spans.
T18 to T22	Impact on African Fish-Eagles breeding and nests	Presence of agricultural land and river/spruit and possible nest location within this habitat	Prior to construction commencing, all areas within 1 km of towers 18 to 22 that potentially contain breeding African Fish-Eagles must be physically inspected by a suitably experienced avifaunal specialist to identify any nests that could be impacted by the construction	Low	No African Fish Eagle nests were identified within 1 km of any of the tower positions. However, search and identification of nests between the spans T18 to T22 will confirm now new or previously unidentified nests just

Tower No.	Impact	Feature / sensitivity	Comment / Recommendation / Mitigation	Impact significance	Impact significance motivation
			of the line. Should any nests be recorded, it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist and the Environmental Control Officer.		prior to construction. If identified appropriate mitigation measures will be recommended by the avifaunal specialist.

Site-specific management and mitigation measures during construction phase include:

1. It is recommended that all construction activities be carried out according to generally accepted environmental best practices.
2. All trees should be searched carefully for any nests, before being trimmed or removed during both the construction and operational phases of the project. If a nest is found, this should be reported to the avifaunal specialist for site specific recommendations.
3. Prior to construction commencing, all areas within 1 km of towers 18 to 22 that potentially contains breeding African Fish-Eagles must be physically inspected by a suitably experienced avifaunal specialist to identify any nests that could be impacted by the construction of the line. Should any nests be recorded, it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist and the Environmental Control Officer.
4. An effective communication strategy should be implemented whereby the avifaunal specialist is provided with a construction schedule which will enable him/her to ascertain if the breeding eagles could be impacted by the construction activities. This could then be addressed through the timing of construction activities during critical periods of the breeding cycle, once it has been established that a particular nest is active.
5. In the event that construction cannot be avoided during critical periods, appropriate, practical measures will need to be agreed upon to reduce the risk of disturbance of the breeding birds. These measures could include temporarily taking the eggs off the nest and keeping it in an incubator in extreme instances, or shielding the chick from the direct sun while construction activities take place at the adjacent tower.
6. While it is not illegal to remove an unoccupied nest that is posing a quality of supply risk, the removal of nests that contain eggs, chicks or adult birds will require a permit to do so.
7. Eskom are requested to notify the Eskom-Endangered Wildlife Trust Strategic Partnership in these instances to arrange for the translocation or removal of the nest.
8. The installation of bird guards above the insulator strings of the self-supporting strain and intermediate structures is highly recommended.

Site-specific management and mitigation measures during operational phase include:

1. Should marking only be implemented along those sections of power line indicated in the Avifauna specialist walk-down report, post-construction monitoring must be implemented every three months for a period of at least three years in an attempt to identify collision hotspots.



2. Following the identification of collision hot-spots, BFDs must be installed on the identified sections of power line within one year of the collision hot-spots being reported.
3. Eskom line and servitude managers are requested to report all bird collisions encountered during routine line patrols of the Nieuwehoop Upington 400kV power line to the Eskom-Endangered Wildlife Trust Strategic Partnership.
4. All BFDs must be maintained for the duration of the operational lifespan of the Nieuwehoop Upington 400kV power line.
5. It is recommended that all operational and maintenance activities be carried out according to generally accepted environmental best practices.
6. Mitigation requirements detailed in the Wetland and Botanical specialist walk-down reports must be implemented to ensure minimal impact in these sensitive areas.
7. Existing roads must be used as far as possible for access during construction and operational phases of the project.
8. Electrocutions will need to be mitigated using site-specific recommendations (provided by the Eskom-Endangered Wildlife Trust Strategic Partnership) if and when these impacts occur.

### 5.3.8 Heritage walk-down findings and management measures

The heritage walk-down focused on identifying any historical, archaeological, cultural or otherwise heritage resources that may occur within the power line servitude or identified tower footprint.

Heritage and cultural features were identified, recorded and photographed by the heritage specialist along the servitude route. The following heritage and cultural sensitivities were identified that may require mitigation measures (Table 5-4).

**Table 5-4: Heritage sensitivities and recommendation per tower location**

Tower No.	Feature / sensitivity	Comment / Recommendation / Mitigation	Impact significance	Impact significance motivation
T25, T26, T30	Unmarked graves and graveyard	Unmarked graves identified at T25 and T26 (see heritage specialist walk-down report for images and description). Conductors will cross over ( $\pm$ 18m above) part of the graveyard but will not affect the graveyard itself and should result in minimal disturbance. Over 500 graves which include marked and unmarked graves present in the graveyard.	High	Demarcate unmarked grave sites and avoid general area. Ensure graveyard is clearly demarcated and completely avoided during construction.
T6, T7	Middens	Midden found between T6 and T7 close to the dirt road entering the study area. Presence of recent refuse on the periphery and MSA material identified toward the centre at the top. Perhaps part of a dump site (tertiary+)	Low	Midden located within corridor but will not form part of construction of towers. No mitigation is required.
T15, T16	Historical	Storage hut / reservoir identified at the sites. Probably built by farmers from previous generation. Limestone quarry in NE corner of feature. Feature includes	Low	Located between towers therefore no impact through construction of towers on associated

Tower No.	Feature / sensitivity	Comment / Recommendation / Mitigation	Impact significance	Impact significance motivation
		what looks like terraces in which limestone was either removed or stored.		cultural material is expected. No mitigation required.
T18, T25, T27	Historical	Mud Brick hut as well as three middens used by farmer as refuse T18 will be constructed in the centre of the third. Several associated MSA material found in Midden 2 and 4. Refer to heritage walk-down report for images and more details. Historical foundations also identified at T25 and T27.	Medium	Located between towers therefore no impact through construction of towers on associated cultural material is expected. No mitigation required.
T65, T66, T67, T69, T70	Early Stone Age (ESA) features	ESA features randomly distributed across sites T65 to T70.	Low	The construction of tower will not affect the distribution of ESA material. No mitigation required.
T1	Middle Stone Age (MSA) feature	MSA features were identified scattered on a rocky outcrop at T1.	Medium	Tower should be moved at least 20m further down the line to avoid destruction of the feature.
T3, T4, T17, T39, T40, T41, T42, T71, T87, T137, T153, T155, T157, T159, T166, T167, T174, T176, T178, T181	Middle Stone Age (MSA) features, including flakes and core scatters	MSA material is randomly scattered across the power line servitude. The small footprint of the tower is expected to not affect the significance of the scatter of tools as there are no associated features.	Low	The construction of tower will not affect the distribution of MSA material, therefore no mitigation required.
T17, T155, T156, T159, T166, T177, T178	Late Stone Age (LSA) scatter, including flakes, ostrich eggshell fragments and arrow/spear heads	Tower site at T17 is close to the highway and fenced off area along the farm. At T155 one handaxe, one Levallois type tool and ostrich eggshell fragments were identified.	Low	The construction of tower will not affect the distribution of LSA material. Phase I recording is seen as sufficient and no further mitigation is required.
T120, T150, T151	Bone scatter	Dead sheep with modern plastic tag identified at T120. Bone scatter of unknown age identified close to T150 and T151, but remains are weathered and show signs of degradation, fragmentation and weathering. Fresh tortoise remains found close to electrified fence.	Medium	Bones should be removed by an ECO/Heritage consultant/faunal specialist.
T152	Horn core fragment, Modern sheep pen	One horn core fragment.	Low	Phase I is seen as sufficient recording and may be demolished, Sheep pen not part of tower construction only within line of conductors.

Site-specific management and mitigation measures during construction phase include:

1. Unmarked graves and graveyard must be marked as No-Go area with no access allowed.
2. Bones should be removed by an ECO/Heritage consultant/faunal specialist.
3. All the heritage resources of low significance need no mitigation or recommendations as construction of the suspensions tower may not affect their distribution or lack there off. In other words they are scatters of out of context resources which may be linked in some way or may just be single instances with no other archaeological material associated with them.

#### **5.4 DELINEATION OF RIPARIAN ZONES**

The riparian zones of the watercourses are regarded as the area of direct influence to the watercourses and so it is these areas that have been delineated and mapped. As the delineation largely represents the zone of influence to the watercourse, it is felt that these areas incorporate buffer zones that are adequate to protection of the habitat units.

Following the completion of an assessment of the surface water ecosystems associated with the proposed Eskom Solar park development near Upington in the Northern Cape Province, the following conclusions are drawn:

- Wetland and aquatic habitat features are not strongly represented within the region due to the generally arid climatic zone, with the Orange River being the only substantial perennial watercourse;
- Watercourses and drainage lines do occur with riparian zones that are mainly characteristic of a relatively denser community of terrestrial floral species. These are functional zones and therefore have been delineated;
- The riparian zones were delineated as river areas, or areas of direct influence to the watercourse. This therefore includes adequate conservation buffer zones;
- Careful planning and strategic placement of infrastructure will allow minimal impacts to the surface water ecosystems within the region;
- It is recommended that surface water habitat units be avoided by infrastructure development as far as possible;
- Indiscriminate habitat destruction must be avoided.

---

## **6 ENVIRONMENTAL GUIDELINES, STANDARDS AND PERMITS**

---

### **6.1 ENVIRONMENTAL AUTHORISATION**

- The EA is a legally binding document in terms of the National Environmental Management Act 107 of 1998 and is included in Appendix C to the EMPr.
- All conditions stipulated in terms of the Environmental Authorisation issued on 17 February 2014 must be complied with and adhered to.

### **6.2 ENVIRONMENTAL GUIDELINES AND STANDARDS**

All applicable environmental standards contained within the environmental legislation will be adhered to. At the time of compiling this EMPr, the following environmental guidelines and standards were identified as being applicable.

#### **6.2.1 *Control of Alien Vegetation***

In terms of Government Notice R1048, the following regulations are applicable with regards to the control of invasive alien vegetation and declared weeds:

- It is illegal to have declared weed species or invasive alien vegetation on one's property.
- The landowner must immediately take steps to eradicate them by using the methods prescribed in the regulations, namely:
  - uprooting and burning, or
  - the application of a suitable chemical weed-killer (herbicide), or
  - any other method of permanent eradication.
- One may not uproot or remove such plants and dump or discard them elsewhere to re-grow or allow their seeds to be spread or blown onto other properties.
- If the landowner does not comply with requirements above, a person may be found guilty of a criminal offence.

#### **6.2.2 *Waste Storage or Disposal***

- All waste (general and hazardous) generated during undertaking of the construction activities may only be disposed of at appropriately licensed waste disposal sites (in terms NEMWA, No 59 of 2008).
- In the event that more than 100m<sup>3</sup> of general waste is stored, or temporarily stored, at the construction site, Eskom must adhere to the provisions and stipulations of the National norms and standards for the storage of waste (GN 926 of 29 November 2013).
- Cognisance must also be taken of the relevant provincial legislation in this regard. It will be noted that all controlling authority regulations pertaining to litter in terms of the Environment Conservation Act (sections 19, 19A and 24A) have been delegated to the provinces.

#### **6.2.3 *Noise Control Regulations***

The National Noise Control Regulations (NCR) of the Environment Conservation Act (No 73 of 1989), Government Notice No. R55 of 14 January 1994, apply for this project. In terms of

these Regulations, noise measurement and assessment is undertaken in compliance with the South African National Standard SANS 10103 for “The measurement and rating of environmental noise with respect to annoyance and to speech communication” in order to determine the suitability of an environment with respect to possible annoyance (i.e. whether complaints could be expected). Section 8.4 of the Standard states that it is highly probable that the noise under investigation is annoying or otherwise intrusive to a community, or a group of persons, if the rating level ( $L_r$ ) of the measured ambient noise (including the noise under investigation) exceeds that of the measured residual noise (in the absence of the noise under investigation), or if the residual noise cannot be measured, exceeds the typical rating level for ambient noise in different districts as set out in Table 6-1 of the SANS Standard. Typical noise rating levels for ambient noise in districts are shown in Table 6-1.

**Table 6-1: Typical noise rating levels for ambient noise in districts**

Type of District	Equivalent Continuous Rating Level for Noise ( $L_{Req,T}$ ) (dBA)					
	Outdoors			Indoors with open windows		
	Day-night ( $L_{R,dn}$ )	Daytime ( $L_{Req,d}$ )	Night-time ( $L_{Req,n}$ )	Day-night ( $L_{R,dn}$ )	Daytime ( $L_{Req,d}$ )	Night-time ( $L_{Req,n}$ )
<b>RESIDENTIAL DISTRICTS</b>						
a) Rural districts	45	45	35	35	35	25
b) Suburban districts (little road traffic)	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
<b>NON RESIDENTIAL DISTRICTS</b>						
d) Urban districts (some workshops, business premises and main roads)	60	60	50	50	50	40
e) Central business districts	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50

### 6.3 ENVIRONMENTAL PERMITTING REQUIREMENTS

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

#### 6.3.1 *Protected Plants*

In terms of the National Forest Act (No 84 of 1998), as amended, and GN 716 of 7 September 2012 (for protected tree species), and the Northern Cape Nature Conservation Act (Act 9 of 2009), the removal, relocation or pruning of any protected plants will require a permit.



Some protected indigenous plants in general are controlled under the relevant Provincial Ordinances or Acts dealing with nature conservation, most notably the Nature and

Environmental Conservation Ordinance (No. 19 of 1974), and its subsequent amendments. Included within the provincial Ordinance is the legislation regarding the plant species on the Red Data list.

Protected species that may occur within the corridor include *Nerine laticoma*, *Harpagophyum procumbens*, a *Lachenalia* sp., and *Hoodia gordonii*. Images of these species are presented below in Table 6-2 to facilitate identification of these species by the ECO, project and site manager, and all site staff. Application for a permit or licence from the Northern Cape Department of Environment and Nature Conservation (NC DENC) or National Department of Agriculture, Forestry and Fisheries (DAFF) will be required to relocate or remove any of the protected species identified.

A botanical specialist has prepared and submitted on behalf of Eskom relevant applications in terms of the relevant regulations for species that may need to be removed or relocation.

**Table 6-2: Protected species that may occur within the study site**

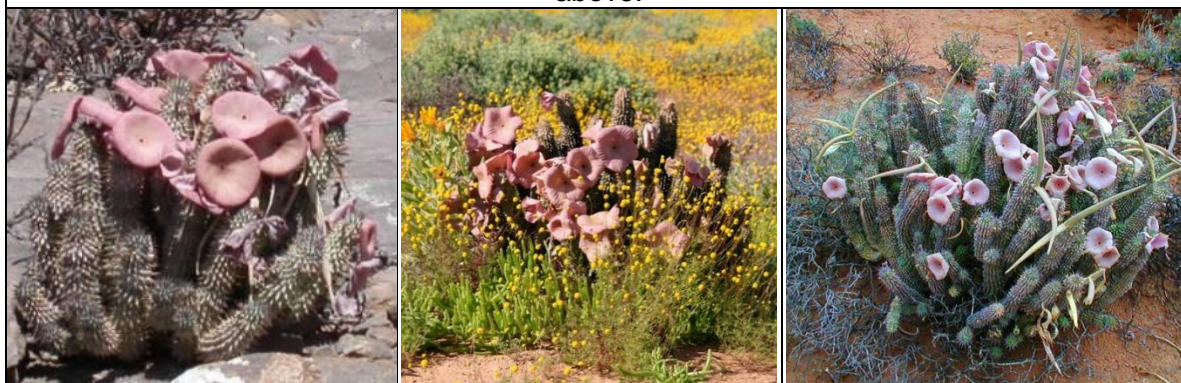
		
<i>Nerine laticoma</i>		
		
<i>Harpagophyum procumbens</i>		





*Lachenalia* sp

All *Lachenalia* spp are protected in terms of the Nature and Environmental Conservation Ordinance (No. 19 of 1974). Some examples of the Northern Cape species are included above.



*Hoodia gordonii*

### 6.3.2 Abstraction of Water

Water for construction and operational activities will be supplied via a pipeline from the //Khara Hais Local Municipality. However, in the event that water is required to be abstracted from the Orange River it will then be necessary to obtain a water use authorisation from the Department of Water and Sanitation (DWS) in terms of Section 21, 40 and 41 of the National Water Act (No 36 of 1998).

### 6.3.3 Heritage Sites

No major heritage resources or artefacts were identified along the power line corridor during the environmental impact assessment and pre-construction specialist corridor walk-down. If however any heritage artefacts were to be discovered during excavation procedure and relevant permits in terms of the National Heritage Resources Act (No 25 of 1999) must be applied and adhered to.

In terms of the National Heritage Resources Act (No 25 of 1999), a permit is required to be obtained for the disturbance, removal or destruction of any national and provincial heritage sites, archaeological and palaeontological sites, burial grounds and graves and public monuments and memorials. Structures older than 60 years are also protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999).

#### **6.3.4 *Borrow pits and fill material requirements***

Should fill material be required for any purpose, the use of borrow pits must comply with the provisions of the Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) administered by the Department of Minerals and Energy. No indigenous and/or protected vegetation or part thereof may be removed without the required permits from the relevant Provincial Nature Conservation Departments.

#### **6.3.5 *Public Health***

Ablution facilities must be approved by the nearest local authority in terms of their by-laws and relevant provincial standard by-laws. These facilities do not fall under provisions of the National Water Services Act (No 108 of 1997). Chemical toilets for temporary purposes must be provided on site and must be emptied at regular intervals.



---

## **7 ROLES AND RESPONSIBILITIES**

---

### **7.1 CONTRACTUAL OBLIGATION**

In order to ensure that this EMPr and/or derivatives thereof are enforced and implemented, these documents must be given legal standing. This shall be achieved through incorporating the EMPr and/or derivatives documents as an addendum to the contract documents for the particular project and specifying under particular conditions of the contract for the tender that the requirements of this EMPr and/or derivatives apply and must be met. This will ensure that the obligations are clearly communicated to contractors and that submitted tenders have taken into account, and budgeted for the environmental requirements specified in this EMPr and/or its derivatives. The successful tender ultimately becomes the signed contract, thereby ensuring that the included EMPr becomes legally binding.

### **7.2 RESPONSIBILITIES AND DUTIES**

#### **7.2.1 *The Developer***

Eskom is the Developer and has overall responsibility for ensuring that the construction and development of the project is undertaken in an environmentally sound and responsible manner, and in particular, reflects the requirements and specifications of the EMPr and recommendations from the relevant authorities.

The responsibilities of the Developer will include:

Appoint or designate a suitably qualified Project Manager to manage the implementation of the proposed project;

- Establish and maintain regular and proactive communications with the designated/appointed PM, Contractor(s) and ECO; and
- Ensure that the EMPr is reviewed and updated as necessary.

Reporting Structure:

The developer will liaise with and/or take instruction from the following:

- Authorities; and
- General Public.

#### **7.2.2 *Project Manager (PM)***

The primary role of the PM is to ensure that the Contractor and Developer's staff complies with the environmental specifications in the EMPr. The PM shall further:

- Oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications; and
- Liaise between and with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences.

In addition the PM shall:

- Designate or appoint a suitably qualified Environmental Manager (EM) that will manage all environmental aspects on behalf of the PM and the Developer
- Review and approve Method Statements produced by the Contractor in connection with the EMPr;
- Assume overall responsibility for the effective implementation and administration of the EMPr;
- Be familiar with the contents of the EMPr, and his role and responsibilities as defined therein;
- Ensure that the EMPr is included in the Contractor's contract;
- Communicate to the Contractor, verbally and in writing, the advice of the ECO and the contents of the ECO reports;
- In conjunction with the Construction Supervisor; undertake regular inspections of the Contractor's site as well as the installation works in order to check for compliance with the EMPr in terms of the specifications outlined therein. Inspections shall take place at least once a week and copies of the monitoring checklist contained in the file;
- Review and approve drawings produced by the Contractor or professional team in connection with, for example, the construction site layout, access/haul roads, etc.;
- Issue site instructions giving effect to the ECO requirements where necessary;
- Keep a register of all complaints and incidents (spills, injuries, complaints, legal transgressions, etc) and other documentation related to the EMPr;
- Report to the ECO any problems (or complaints) which cannot first be resolved in co-operation with the Contractor(s);
- Implement recommendations of possible audits;
- Implement Temporary Work Stoppages as advised by the ECO, where serious environmental infringements and non-compliances have occurred;
- Facilitate proactive communication between all role-players in the interests of effective environmental management; and
- Ensure that construction staff is trained in accordance with requirements of the EMPr.

### Reporting Structure:

The PM will report to the Developer, as and when required.

#### **7.2.3 Contractor**

The Developer, or PM acting on his behalf, will appoint a Contractor(s) to implement the development. The Contractor(s) will be contractually required to undertake their activities in an environmentally responsible manner, as described in the EMPr.

The role of the Contractor shall be to:

- Ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts;
- Preserve the natural environment by limiting any destructive actions on site;
- Ensure that suitable records are kept and that the appropriate documentation is available to the PM;
- Take into consideration the legal rights of the individual Landowner, Communities and Eskom Regional staff;
- Ensure quality in all work done, technical and environmental;
- Underwrite Eskom's Environmental Policy at all times, and
- Ensure that all subcontractors and other workers appointed by the Contractor are complying with and implementing the EMPr during the duration of their specific contracts.

The responsibilities of the Contractor will be to:

- Discuss implementation of and compliance with this document with staff at routine site meetings;
- Designate, appoint and/or assign tasks to personnel who will be responsible for managing all or parts of the EMPr. The Contractor must appoint or designate a Safety, Health, Environment and Quality Officer (SHEQO) to monitor daily implementation of the EMPr on the Contractor's behalf as a minimum;
- Monitor environmental performance and conformance with the specifications contained in this document during site inspections;
- Report progress towards implementation of and non-conformances with this document at site meetings with the PM;
- Advise the PM of any incidents or emergencies on site, together with a record of action taken;

- Report and record all accidents and incidents resulting in injury or death; and
- Resolve problems and claims arising from damage immediately to ensure a smooth flow of operations;

Reporting Structure:

The Contractor will report to the PM and ECO, as and when required.

#### **7.2.4 Subcontractors**

The Contractor may from time to time appoint Subcontractors.

The role of the Subcontractors shall be to:

- Perform certain services and/or provide certain products on behalf of the Contractor. The Subcontractors will be contractually required to undertake their activities in an environmentally responsible manner, as described in the EMPr; and
- Ensure environmental awareness among employees so that they are fully aware of, and understand the Environmental Specifications and the need for them.

The responsibilities of the Subcontractor will be to:

- Be familiar with the contents of the EMPr, and his role and responsibilities as defined therein;
- Comply with the Environmental Specifications in the EMPr and associated instructions issued by the Contractor to ensure compliance;
- Notify the Contractor verbally and in writing, immediately in the event of any accidental infringements of the Environmental Specifications and ensure appropriate remedial action is taken; and
- Notify the Contractor, verbally and in writing at least 10 working days in advance of any activity he/she has reason to believe may have significant adverse environmental impacts, so that mitigation measures may be implemented timely.

Reporting Structure:

Subcontractors will report to and receive instructions from the Main Contractor.

#### **7.2.5 Environmental Control Officer (ECO)**

Through the PM the Developer will appointed an independent ECO to monitor and oversee implementation of the EMPr for the proposed construction works. The ECO is independent from the Developer, the PM and the Contractor(s). The ECO is given authority to ensure that

the EMPr is fully implemented and that appropriate actions are undertaken to address any discrepancies and non-compliances.

The role of the ECO shall be to:

- Act as site 'custodian' for the implementation, integration and maintenance of the EMPr in accordance with the contractual requirements;
- Ensure successful implementation of the EMPr; and
- Ensure that the Contractor, his employees and/or Subcontractors receive the appropriate environmental awareness training prior to commencing activities.

The responsibilities of the ECO will be to:

- Liaise with the PM on the level of compliance with the EMPr achieved by the Contractor on a regular basis for the duration of the contract;
- Advise the PM on the interpretation and enforcement of the Environmental Specifications (ES), including evaluation of non-compliances;
- Supply environmental information as and when required;
- Review and approve Method Statements produced by the Contractor, in conjunction with the PM;
- Demarcate particularly sensitive areas (including all No-Go areas) and to pass instructions through the PM concerning works in these areas;
- Monitor any basic physical changes to the environment as a consequence of the construction works according to an audit schedule;
- Attend regular site meetings and project steering committee meetings;
- Undertake regular monthly audits of the construction works and to generate monthly audit reports. These reports are to be forwarded to the PM who will communicate the results and conclusions with the Developer;
- Communicate frequently and openly with the Contractor and the PM to ensure effective, proactive environmental management, with the overall objective of preventing or reducing negative environmental impacts and/or enhancing positive environmental impacts;
- Advise the PM on remedial actions for the protection of the environment in the event of any accidents or emergencies during construction, and to advise on appropriate clean-up activities;
- Review complaints received and make instructions as necessary; and
- Identify and make recommendations for minor amendments to the EMPr as and when appropriate.

Reporting Structure:

The ECO will report to the PM, who in turn will report to the Developer.

### **7.3 TRAINING**

- The SHEQO shall be appropriately trained in environmental management and shall possess the skills necessary to impart environmental management skills to all personnel involved in the construction, rehabilitation and operation of the corridor;
- The PM and SHEQO shall ensure, on behalf of Eskom, that the employees (including construction workers, engineers, and long-term employees) are adequately trained on the stipulations of the EMPr; and
- All employees shall have an induction presentation on environmental awareness. The cost, venue and logistics shall be for Eskom's account.

Where possible, training must be conducted in the language of the employees. The induction and training shall, as a minimum, include the following:

- The importance of conformance with all the specifications of the EMPr and other environmental policies and procedures;
- The significant 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 EMPr and other environmental policies and procedures;
- The potential consequences of departure from specified operating procedures; and
- The mitigation measures required to be implemented when carrying out their work activities.

### **7.4 AWARENESS AND COMPETENCE**

It is important to ensure that all personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm.

To achieve effective environmental management, it is important that employees, contractors and subcontractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. Environmental training must include the following:

- Employees must have a basic understanding of the key environmental features of the construction site and the surrounding environment;

- Employees will be thoroughly familiar with the requirements of the EMPr and the environmental specifications as they apply to the construction of the power station;
- Employees must undergo training for the operation and maintenance activities associated with a Concentrating Solar Power (CSP) Plant and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated;
- Basic training in the identification of protected, rare and endangered flora and fauna that may be encountered on the site;
- Awareness of any other environmental matters, which are deemed to be necessary by the ECO;
- The training must include a system of certification and/or accreditation related to training, to ensure all the workers have auditable proof of work performed;
- Records must be kept of those that have completed the relevant training;
- Training must include the environment, health and safety as well as basic HIV/AIDS education.

Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Where training has been done verbally, persons having received training must indicate in writing that they have indeed attended a training session and have been notified in detail of the contents and requirements of the EMPr (Attendance Register and a copy of the presentation).

## **7.5 MONITORING**

- A monitoring programme will be in place not only to ensure conformance with the EMPr through the contract/work instruction specifications, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required. As part of the contract or work instruction, Eskom will stipulate the period and frequency of monitoring required. This will be determined in consultation with relevant stakeholders and authorities. The Project Manager will ensure that the monitoring is carried out;
- All instruments and devices used for the measurement or monitoring of any aspect of this EMPr must be calibrated and appropriately operated and maintained;
- Records relating to monitoring and auditing must be made available by the applicant on request by any authority in respect of this development;
- The DEA reserves the right to monitor and audit the development throughout its full life cycle to ensure that it complies with the conditions stipulated in the Environmental Authorisation as well as mitigation measures in the final environmental impact assessment report and its appendices, and the EMPr;

- The applicant must appoint a suitably qualified independent environmental auditor to conduct environmental compliance audits to ensure that the conditions, mitigation measures and recommendations stipulated in the environmental authorisation, FEIR and the EMPr are complied with;
- An independent post-construction environmental audit must be conducted by the auditor to ensure that the conditions, mitigation measures and recommendations stipulated in the Environmental Authorisation, FEIR and the EMPr are complied with. The results of this audit must be submitted in writing to the DEA within 10 (ten) days after completion of the audit.

## **7.6 NON-CONFORMANCE AND CORRECTIVE ACTION**

The monitoring of the construction or operation of the power station may identify non-conformances of the EMPr. Non-conformances may also be identified through incidents, emergencies or complaints. In order to correct these non-conformances, the source must be determined and corrective actions must be identified.

### **7.6.1 *Compliance with the Environmental Management Programme Specifications and Environmental Authorisation conditions***

- The EMPr will be available on-site at all times;
- All persons employed by the contractor or his sub-contractors will abide by the requirements of the EMPr;
- Contract conditions to include measures to be taken in the event of a construction workforce found to be in breach of any of the specifications contained within the EMPr;
- The contractor will not direct a person to undertake any activity which would place them in contravention of any specification contained within the EMPr;
- Should the Contractor be in breach of any of the specifications contained in the EMPr, the Project Manager will, in writing, instruct the Contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue;
- Should non-compliance continue, further written notification will be forwarded to the Contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously;
- The Contractor will be responsible and will bear the cost of any delays, corrective or remedial actions required as a result of non-compliance with the specifications and clauses of the EMPr;



- An appropriate reporting schedule for frequent reporting (of compliance with the EA/EMPr) to the DEA, NC DENC and interested and affected parties will be developed. The process to be followed for the auditing of the EA conditions/EMPr, as well as the reporting procedure to be followed, will be outlined in this document;
- The Project Manager must notify the DEA, NC DENC and any other relevant authority, in writing, within 24 hours thereof if any condition of the EA authorisation is not adhered to;
- Departmental officials will be given access to the property referred to in the EA for the purpose of assessing and/or monitoring compliance with the conditions contained in the EA, at all reasonable times;
- Failure to comply with any of the EA conditions may result in the DEA withdrawing the authorisation, issuing directives to address the non-compliance- including an order to cease activity-as well as instituting criminal and/or civil proceedings to enforce compliance.

## **7.7 DOCUMENTATION AND REPORTING**

The following documentation must be kept on site in order to record compliance with the EMPr:

- Record of Complaints;
- Monitoring Results;
- Notification of Emergencies and Incidents.

### **7.7.1 *Environmental Register***

The Contractor will report incidents involving Contractor employees and/or the public that could potentially cause negative sentiment and perception towards the project:

- Report incidents involving contractor employees and/or the public that could potentially cause negative sentiment and perception towards the project and/or Eskom;
- Report environmental complaints and correspondence received from the public to the Project Manager or the Environmental Control Officer;
- Record and report incidents that cause harm or may cause harm to the environment to the Environmental Control Officer;
- Record all hazardous materials used on site;
- Maintain a record of all Waste Disposal Manifests detailing the nature of the waste disposed of, the waste classification and the location of the site to which such waste was sent;
- The above records will form an integral part of the Contractors' Records. These records will be kept with the EMPr, and will be made available for scrutiny if so requested by the Project Manager or his delegate and the Environmental Control Officer;

- The Environmental Control Officer will put in place an Environmental Register to document:
  - All environmental complaints and correspondence received from the public, Eskom or the construction workforce;
  - Incidents of non-compliance with the EMPr;
  - Any other environmental incidents related to the construction phase of the project.
- The Environmental Control Officer will ensure that the following information is recorded for all complaints/incidents:
  - Nature of complaint/incident;
  - Causes of complaint/incident;
  - Party/parties responsible for causing complaint/incident;
  - Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident;
  - Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident;
  - Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
  - Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented;
  - Copies of all correspondence received regarding complaints/incidents.

## **7.8 PUBLIC COMMUNICATION AND LIAISON WITH I&APS**

- Eskom must ensure that the public and surrounding communities are informed and updated throughout the construction and operational phases.
- Sufficient signage should be erected around the site (including at the entrance), informing the public of the construction activities taking place. The signboards should include the following information:
  - The name of the contractor;
  - The name and contact details of the site representative to be contact in the event of emergencies or complaint registration;
  - The name and contact details of the ECO to be contact in the event of the contravention of stipulations in the EMPr.

## **7.9 COMMISSIONING OF TENDERS FOR THE PROJECT**

- All tendering Contractors / Sub-contractors will be made aware of the contents of this EMPr and any penalties arising from non-compliance; and

- All appointed Contractors / Sub-contractors will be required to attend the EMPr training and induction as detailed in the section above.

#### **7.10 ENVIRONMENTAL AUTHORISATION**

The Environmental Control Officer (ECO) shall convey the contents of this EMPr and the conditions of the Environmental Authorisation from the Authorities and discuss the contents in detail with the Eskom Project Manager and Contractor at a pre-construction meeting. This formal induction training is a requirement of ISO 14001 and shall be done with all main and sub-contractors. Record of the training dates, people who attended and discussion points shall be kept by the ECO.

#### **7.11 ENVIRONMENTAL MANAGEMENT MEASURES**

The management measures documented in each of the sub-sections below have been compiled using the following information:

- Impact Assessment and mitigation measures documented in the FEIR.
- The standard EMPr utilised by Eskom: Transmission for the construction of power lines.

In addition to the abovementioned information sources, the EMPr will be updated to include the conditions documented in the Environmental Authorisation to be received upon approval of the EIA.

## 8 ENVIRONMENTAL SPECIFICATIONS

### 8.1 CONSTRUCTION INITIATION

**Table 8-1: Environmental Management Measures during construction Initiation**

Objectives								
	<ul style="list-style-type: none"> <li>Ensure that all necessary legal obligations and contractual conditions have been met prior to the commencement with construction;</li> <li>To ensure that all role players and stakeholders are aware of the pending construction activities and have received timeous notice; and</li> <li>To ensure that power outages are avoided wherever possible during the construction phase.</li> </ul>							

No	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
<b>Pre-Construction Phase</b>								
1	Labour Issues	Eskom must appoint a suitably qualified Environmental Officer (hereafter referred to as ECO) who would act on behalf of the applicant, on a daily basis, monitor project compliance with the conditions of environmental authorisation, environmental legislation and the recommendations of the revised EMPr. This role will be fulfilled by the appointed ECO.	Life of the Project	Daily	PM	PM	EM	C
		The ECO must be appointed prior to the commencement of construction and pre-construction related activities and the authorities must be notified of such an appointment.	Life of the Project	Once off	PM	PM	EM	C / RA
		The ECO shall remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is handed over to Eskom by the contractor for operation;	Life of the Project	Daily	PM	PM	EM	C
		The ECO shall maintain the following on site: <ul style="list-style-type: none"> <li>Environmental authorisation and pertinent legislation,</li> <li>Relevant permits and licences,</li> <li>Method Statements,</li> <li>A daily site diary;</li> <li>A non-conformance register; and</li> <li>A public complaint registers</li> </ul>	Through-out project	Daily	PM	ECO	SHEQO	EM PM Eskom
		The Contractor shall designate or appoint a suitably qualified Safety, Health, Environment and Quality Officer (SHEQO) to oversee implementation of the EMPr	Life of the Project	Once off	C	C	C	EM PM Eskom
2	Initiation	The authorised activity / activities may not commence within thirty (30)	Prior to	Once off	PM	PM	EM	RA

No	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		days of the date of signature of the authorisation;	authorisation				ECO	C
		Should Eskom be notified by the minister of a suspension of the authorisation pending appeal procedures, Eskom may not commence with the activity / activities unless authorised by the minister in writing.	Through-out project	Throughout Project / as and when necessary	PM	PM SM	EM ECO	RA C
		Fourteen (14) days written notice must be given to the Department that the activity will commence. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the activity will commence.	Prior to commencement	Once - off	PM	EM	EM	RA
		Fourteen (14) days written notice must be given to the Department that the operational phase of the activity will commence.	14 days	Prior to operation commencement	C	PM SM	EM ECO	RA
		A copy of the authorisation must be kept at the property where the activity will be undertaken. The authorisation must be produced to any authorised official of the Department who requests to see it and must be made available for inspection by any employee or agent of the holder of the authorisation who works or undertake work at the property;	Through-out	Monthly Inspection	PM	EM C	SHEQO C	EM PM C
		No work shall commence until permission is granted from the Environmental Advisor from Transmission Services and acceptance of this proposal and EMPr from DEA has been obtained.	Prior to commencement	Once-off	SM C	PM	ECO	EM
		All relevant permits and permissions shall be obtained from the relevant authorities to undertake construction activities as necessary.	Prior to commencement	Once - off	PM	EM	EM ECO	RA
		Activities/works shall be carried out in accordance with the approved Method Statement.	Life of the Project	Daily	C	C	SHEQO	ECO EM PM
		An environmental awareness training session for all of the Contractor's staff of is required.	Prior to commencement	Once - off	PM	EM ECO	SHEQO ECO	C EM PM
		The course content for the environmental awareness training course shall be provided to the Contractor.	Prior to commencement	Once - off	PM	ECO EM	ECO	SHEQO C PM
		The training session shall be delivered in the languages of the site staff.	Prior to commencement	As required	PM	EM ECO	ECO SHEQO	C PM

No	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		Method Statements shall be submitted at least 10 working days prior to the commencement of work.	Prior to commencement	Once-off	C	C	SHEQO	ECO EM PM
		Obtain a signed agreement statement from the contractor indicating their willingness to comply with the EMPr.	Prior to commencement	Once - off	C	SM	ECO	PM EM
<b>Construction Phase</b>								
1	Construction Initiation	Ensure that the grid is considered throughout the construction phase.	Life of Project	Throughout construction	PM	C	SHEQO	PM EM ECO
		Where any of the applicant's contact details change, including then name of the responsible person, the physical or postal address and/or telephonic details, the applicant must notify the Department as soon as the new details become known to the applicant;	Life of Project	Throughout construction	PM	EM	EM	C SHEQO ECO RA
		The holder of the authorisation must notify the Department, in writing and within 48 hours, if conditions of the authorisation cannot be or is not adhered to. In all other cases, the holder of the authorisation must notify the Department, in writing, within 48 hours if a condition of the authorisation is not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance; and	Life of the Project	As required	PM	PM ECO	ECO SHEQO	C PM RA
		Non-compliance with a condition of this authorisation may result in criminal prosecution or other actions as per the National Environmental Management Act, 1998 and the regulations.	Life of the Project	Life of Project	PM	PM	ECO	C SHEQO RA
2	Labour Issues	Ensure proper supervision of employees at all times.	Life of the Project	Daily	C PM	EM SHEQO	EM SHEQO	PM C RA
<b>Rehabilitation Phase</b>								
None								
<b>Operational Phase</b>								
None								

## 8.2 SITE ESTABLISHMENT AND DEMARCATION

**Table 8-2: Environmental Management Measures during site establishment and demarcation**

Objectives	<p><b>Project Area</b></p> <ul style="list-style-type: none"> <li>• Ensure proper demarcation of the project area prior to construction;</li> <li>• Ensure timely notice and negotiation with stakeholders in the event that access is required for construction purposes;</li> <li>• Ensure that all areas impacted during construction are rehabilitated to suitable levels; and</li> <li>• Ensure site is of sufficient size to accommodate the needs of all subcontractors that may work on the project.</li> </ul> <p><b>Existing services</b></p> <ul style="list-style-type: none"> <li>• The Contractor must be familiar with the position of existing services and infrastructure;</li> <li>• The Contractor shall ensure that existing services are not damaged or disrupted unless required by the contract;</li> <li>• The Contractor shall be responsible, at his own cost, for the repair and reinstatement of any infrastructure that is damaged or services that are interrupted. Such repair or reinstatement shall receive top priority over all other activities.</li> </ul> <p><b>Gate Installation</b></p> <ul style="list-style-type: none"> <li>• Properly installed gates to allow access to the servitude;</li> <li>• Minimise damage to fences; and</li> <li>• Limit access to Eskom and Contractor personnel with gate keys.</li> </ul> <p><b>Servicing Vehicles</b></p> <ul style="list-style-type: none"> <li>• Prevention of pollution of the environment; and</li> <li>• Minimise chances of transgression of the acts controlling pollution.</li> </ul> <p><b>Batching Plants</b></p> <ul style="list-style-type: none"> <li>• To ensure all agreements with Landowners are adhered to;</li> <li>• Prevention of complaints from stakeholders; and</li> <li>• Successful rehabilitation of disturbed areas.</li> </ul> <p><b>Wet Areas</b></p> <ul style="list-style-type: none"> <li>• Avoid impact to wet areas.</li> </ul> <p><b>Sanitation</b></p> <ul style="list-style-type: none"> <li>• Ensure that proper sanitation is received.</li> </ul> <p><b>Visual</b></p> <ul style="list-style-type: none"> <li>• Ensure that the construction site is kept neat and tidy at all times;</li> <li>• Contain and store general and construction related waste in the appropriate manner; and</li> <li>• Ensure the construction site or contractor's camp is cordoned off or shielded from view with appropriate material.</li> </ul>
------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
<b>Pre-Construction Phase</b>								
1	Gate Installation and Control	No new gate construction is anticipated, however, if required, the contractor must refer to the Fencing Act, Act no 31 of 1963 as well as the Eskom Gate Policy TGL41-338 or the most recent revision thereof.	Not anticipated	Throughout Project	C	SHEQO	ECO SHEQO	EM, PM
		Gate installation shall be according best practice and procedures.	Not anticipated	Once -off	C	SHEQO	ECO SHEQO	EM PM
		All gates installed in electrified fencing shall be re-electrified.	Not anticipated	Once -off	C	SHEQO	ECO SHEQO	EM, PM ECO
		The PM in consultation with the ECO shall approve gate positions.	Not anticipated	Once -off	C	SHEQO	ECO SHEQO	EM, PM ECO
		All gate positions shall be three (3) metres off centre to allow for continued access when stringing takes place.	Not anticipated	Once -off	C	SHEQO	ECO SHEQO	EM, PM ECO
2	Batching Plants	The siting, if necessary, of batching plants shall be done in conjunction with the Eskom PM and the ECO.	Not anticipated	Once -off	C	SHEQO	ECO SHEQO	EM, PM ECO
		Refer to TRMSCAAC1 REV 3 section 4.8 for specifications regarding batching plants.	Pre-Construction	Once off	C	SHEQO	ECO SHEQO	EM, ECO PM
		Ensure all agreements reached with the Landowner are fulfilled.	Pre-Construction	Once -off	C	SHEQO	ECO SHEQO	EM, PM ECO
3	Sanitation	The Contractor shall install mobile chemical toilets on site (TRMSCAAC1 REV 3). The Contractor camp shall have the necessary ablution facilities with chemical toilets where such facilities are not available at commencement of construction.	Throughout	Weekly	C	SHEQO	ECO	EM PM
		The Contractor will be responsible for the provision of and proper utilisation, maintenance and management of toilet, wash and waste facilities. Toilet facilities supplied by the contractor for the workers shall occur at a maximum ratio of 1 toilet per 15 workers. All temporary / portable toilets shall be secured to the ground to prevent them from toppling due to wind or any other cause.	Throughout construction	Daily	C	SHEQO	ECO	EM PM
		Prior to the establishment of the ablution facilities, the Site Manager must approve an appropriate location.	Pre-Construction	Once-off	C	SHEQO	ECO	EM PM
		The entrances to the ablution facilities shall be adequately screened from public view.	Pre-Construction	Once-off	C	SHEQO	ECO	EM PM
4	Site Establishment – Contractors camp, wastewater	The contractor's camp shall be sited so as to cause the least amount of disturbance to adjacent landowners.	Pre-Construction	Once-off	C	SHEQO	ECO	EM PM
		The contractor's camp shall be fenced and the contractor	Throughout	Weekly	C	SHEQO	ECO	EM



No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
	management, Shower facilities	shall maintain in good order all fencing for the duration of the construction activities.	Construction					PM
		Site establishment shall take place in an orderly manner and all amenities shall be installed at Camp sites before the main workforce move onto site.	Pre-construction	Monthly	C	SHEQO	ECO	EM, PM ECO
		The Contractor shall supply a wastewater management system that will comply with legal requirements and be acceptable to Eskom. A septic tank system is recommended to ensure the best practice environmental solution.	Pre-Construction	Once-off	C	SHEQO	ECO	EM, PM ECO
		Where Eskom facilities are available the Contractor shall make use of such facilities where it is viable and negotiated with the Grid.	Pre-Construction	Once-off	C	SHEQO	ECO	ECO, EM PM
		Should shower facilities be provided for the use by staff staying on site, the following controls must be imposed: <ul style="list-style-type: none"> <li>Positioning of the shower, and specifically its discharge point, will be carried out to ensure that erosion and build up detergents does not occur;</li> <li>All discharge from the shower and other washing facilities must pass through a suitable filter to reduce the load of detergents to the environment;</li> <li>Filtered water discharge may thereafter be released to the environment, but mechanisms will be investigated to ensure that the water is evenly dispersed so as to lead to "greening up" and / or swampy conditions in one limited area;</li> <li>Use of the shower facilities must be limited to staff or authorised persons only.</li> </ul>	Throughout Construction	Daily	C	C SHEQO	ECO	EM PM
		The cooking area will be positioned such that no vegetation is in close proximity thereto, including overhanging trees. An area around the cooking area will be cleared such that any escaping embers will not start an uncontrolled fire.	Pre-Construction	Once-off	C	SHEQO	ECO SHEQO	EM PM
5	Eating Areas	Eating areas shall be designated and demarcated.	Pre-Construction	Once-off	C	SHEQO	ECO	EM, PM
		Sufficient bins shall be present in this area for all waste material.	Pre-Construction	Once-off	C	SHEQO	ECO	EM, PM
		Dish washing facilities shall be provided. These may be very basic, but a process must be put in place to ensure that wastewater is disposed of appropriately (see Site	Pre-Construction	Once-off	C	SHEQO	ECO	EM, PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
		Establishment - showers).						
<b>Construction Phase</b>								
1	Gate Installation and Control	Adhere to the Eskom access to Farms (TPC41-340) and Eskom Gate Policy (TGL41-338)	Construction Phase	Throughout	C	SHEQO	ECO SHEQO	EM PM
		All gates shall be fitted with locks and be kept locked at all times.	Construction Phase	Throughout	C	SHEQO	ECO SHEQO	EM PM
		Gates shall only be left open on request of the Landowner if he accepts partial responsibility for such gates in writing.	When necessary	When necessary	C	SHEQO	ECO SHEQO	EM PM
		Claims arising from gates left open shall be investigated and settled in full by the Contractor.	When necessary	When necessary	C	SHEQO	ECO SHEQO	EM PM
		If any fencing interferes with the construction process, such fencing shall be deviated / protected until construction is completed.	When necessary	When necessary	C	SHEQO	ECO SHEQO	EM PM
2	Project Area	Construction activities are limited to the area as demarcated by EA / EM within the site identified for the construction of the substation/power line.	Throughout Project	Monthly	C	SHEQO	ECO	EM PM
		Any area outside the construction area, required to facilitate access, construction activities, construction camps or material storage areas, where necessary, shall be negotiated with the affected stakeholders and written agreements shall be obtained.	Throughout Project	Monthly	C	SHEQO	ECO	EM PM
		All construction areas shall be cleared in accordance with the EA / EM Standard for Bush clearing ESKASABG3.	Throughout Project	Monthly	C	SHEQO	ECO	EM PM
		Any extra space to be cleared outside the construction area shall be negotiated and approved by EA / EM. All areas marked as no go areas inside the substation parameters shall be treated with the utmost care and responsibility.	Throughout Project	Monthly	C	SHEQO	ECO	EM PM
3	Batching Plants	The batching plant area shall be operated in such a way as to prevent contaminated water to run off the site and polluting nearby soils, streams or water bodies. To this effect diversion berms can be installed to direct all wastewater to a catchments area.	Throughout Construction	Weekly	C	C	ECO	EM PM
4	Sanitation	Staff shall be sensitised to the fact that they should use these toilets at all times. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities.	Throughout Construction	Daily	C	SHEQO	ECO SHEQO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
		No use of the veld shall be allowed, as this always creates problems with the landowners and may lead to claims for problems with stock diseases.	Throughout Construction	Daily	C	SHEQO	ECO SHEQO	EM PM
		Toilet paper is also a source of littering, and the Contractor shall be forced to clean up any litter.	Throughout Construction	Daily	C	SHEQO	ECO SHEQO	EM PM
		Ablution facilities must be maintained in a hygienic state and serviced regularly. Toilet paper will be provided.	Throughout Construction	Daily	C	SHEQO	ECO SHEQO	EM PM
		The Contractor will ensure that no spillage occurs when the toilets are cleaned or emptied and that a licensed provider removes the contents from the site.	Throughout Construction	Weekly	C	SHEQO	ECO SHEQO	EM PM
		Disposal of such waste is only acceptable at a licensed waste disposal facility.	Throughout Construction	Weekly	C	SHEQO	ECO SHEQO	EM PM
5	Site Establishment	The site must be kept tidy and hygienic at all times with special reference to sanitation & water management.	Throughout Construction	Weekly	C	SHEQO	ECO SHEQO	EM PM
		Open uncontrolled fires will be forbidden at the site camp. Rather "contained" cooking mechanisms will be used – e.g. gas stoves or an enclosed braai facility.	Throughout Construction	Weekly	C	SHEQO	ECO	EM PM
		Where possible and practical all maintenance of vehicles and equipment shall take place in the workshop area.	Throughout Construction	Weekly	C	SHEQO	ECO	EM PM
		Workshop areas shall be monitored for oil and fuel spills and such spills shall be cleaned and remediate to the satisfaction of the ECO.	Throughout Construction	Weekly	C	SHEQO	ECO	EM PM
		The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site.	Throughout Construction	Daily	C	SHEQO	ECO	EM PM
		No equipment shall be used which may cause irreparable damage to wet areas. The contractor shall use alternative methods of construction in such areas.	Throughout Construction	Daily	C	SHEQO	ECO	EM PM
6	Emergency procedures	The site must be kept tidy and hygienic at all times with special reference to sanitation & water management.	Throughout Construction	Weekly	C	SHEQO	SHEQO ECO	EM PM
		The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site.	Throughout Construction	Weekly	C	SHEQO	SHEQO ECO	EM PM
		Open uncontrolled fires will be forbidden at the site camp. Rather "contained" cooking mechanisms will be used – e.g. gas stoves or an enclosed braai facility.	Throughout Construction	Weekly	C	SHEQO	SHEQO ECO	EM PM
7	Workshop	Workshop areas shall be monitored for oil and fuel spills and such spills shall be cleaned and remediate to the satisfaction of the ECO.	Throughout Construction	Weekly	C	SHEQO	SHEQO ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
		Where possible and practical all maintenance of vehicles and equipment shall take place in the workshop area.	Throughout Construction	Weekly	C	SHEQO	SHEQO ECO	EM PM
		No equipment shall be used which may cause irreparable damage to wet areas. The contractor shall use alternative methods of construction in such areas.	Throughout Construction	Daily	C	SHEQO	SHEQO ECO	EM PM
8	Eating areas	The feeding of, or leaving of food for animals, is strictly prohibited.	Throughout Construction	Monthly	C	SHEQO	ECO	EM PM
		No fires for the purpose of cooking or warming purposes will be permitted other than within designated areas, for instance, at the site camp.	Throughout Construction	Daily	C	SHEQO	ECO	EM PM
<b>Rehabilitation Phase</b>								
1	Batching Plants	All areas used as batching areas must be rehabilitated once construction is completed. Should any claim be instituted against EA / EM, due to the actions of the Contractor at a batching plant site, EA / EM shall hold the Contractor fully responsible for the claim until such time that the Contractor can prove otherwise with the necessary documentation.	Once Construction is completed – during rehabilitation	Monthly	C	SHEQO	ECO	EM PM
2.	Site Decommissioning	All areas where site infrastructure or camp sites are established must be rehabilitated to their original state in which they were found.	Once Construction is completed – during rehabilitation	Monthly	C	SHEQO	ECO	EM PM
		Prior to the removal of structures an assessment of the end land use will be undertaken to determine which structures will be removed or retained.	Once Construction is completed – during rehabilitation	Monthly	C	SHEQO	ECO	EM PM
		Any specific requirements to prevent pollution during demolition of structures must be identified prior to the commencement of rehabilitation activities.	Prior to rehabilitation	Once - off	C	SHEQO	ECO	EM PM
		Disposal requirements must be identified prior to the commencement of rehabilitation or structure removal.	Prior to rehabilitation	Once - off	C	SHEQO	ECO	EM PM
		Equipment, structures and building material that can be reused will be identified prior to the commencement of rehabilitation activities.	Prior to rehabilitation	Once - off	C	SHEQO	ECO	EM PM
		Scrap metal and equipment will be sold as scrap or disposed of at a suitably licensed facility.	Once Construction is	Monthly	C	SHEQO	ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
			completed – during rehabilitation					
		Vegetation that was removed for the establishment of site infrastructure shall be reinstated into the area.	Once Construction is completed – during rehabilitation	Monthly	C	SHEQO	ECO	EM PM
<b>Operational Phase</b>								
1	Gate Control	Gates must be fitted with Eskom locks.	Permanent	Throughout	C	SHEQO	ECO	EM PM
		Such gates shall be clearly marked by painting the posts green.	After construction – once off	Once off	C	SHEQO	ECO	EM PM

### 8.3 WATER MANAGEMENT (INCLUDING STORM WATER, WATER SOURCES, WET AREAS)

**Table 8-3: Environmental Management Measures for Water Management.**

<b>Objectives</b>	<b>Storm-water Management</b>							
	<ul style="list-style-type: none"> <li>Effectively control storm water runoff to ensure that impacts to surface water resources are controlled, and erosion is not present on site.</li> </ul>							
	<b>River Crossings</b>							
	<ul style="list-style-type: none"> <li>Minimise damage to river and stream embankments;</li> <li>No access roads through river and stream banks;</li> <li>No visible erosion scars on embankments once construction is completed;</li> <li>Monitor water quality; and</li> <li>Minimise erosion of embankments and subsequent siltation of rivers, streams and dams.</li> </ul>							
	<b>Wetlands</b>							
	<ul style="list-style-type: none"> <li>No construction activities within 50m of designated wetlands/water bodies as identified in the EIA; and</li> <li>No pollution or effluent is to come in contact with wetland areas.</li> </ul>							

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
<b>Pre-Construction Phase</b>								
1	Water Sources	Should water be required from sources other than Eskom supply, a written agreement shall be reached between the	Throughout Project	When necessary	PM	PM	EM ECO	C SHEQO

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		Contractor and the stakeholder involved.						
		Should the Contractor be required to use water from a natural source, the Contractor shall supply a method statement to that effect and obtain the required permits. No construction shall take place in the wetland, streams and other river courses without the necessary water license from the Department of Water Affairs and Forestry.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
<b>Construction Phase</b>								
1	Water Sources	Strict control shall be maintained and the ECO shall regularly inspect the abstraction point and methods used.	Throughout Project	Weekly	C CECO	SM	ECO	EA, EM PM
2	Wetlands/ Water bodies	No construction is to take place within wetlands / water bodies unless a Water Use License has been issued therefore. Including no vehicular traffic in wet areas / wetlands.	Throughout Project	Weekly	C	SHEQO C	ECO SHEQO	EM PM
		Only existing roads through such areas may be used with the approval of Eskom.	Throughout Project	Monthly	C	C SHEQO	ECO SHEQO	EM PM
		The contractor shall use alternative methods of construction in such areas. <b>Refer to TRMSCAAC1 REV 3 section 4.4.1 regarding access through seasonally wet areas.</b>	Throughout Project	Monthly	C CECO	SM	ECO	EM PM
		Berms should be created not closer than 10m from identified wetland areas, so as to ensure that no construction material and/or waste flow into wetland systems.	Throughout Project	When necessary	C	C SHEQO	ECO SHEQO	EM PM
3	Dust control	The dust control measures, such as watering, chemical stabilisation and the reduction of surface wind speed through the use of windbreaks and source enclosures must be put in place during construction activities. Emission control efficiencies of 50% can readily be achieved through the implementation of effective watering programme for unpaved roads and material handling points.	During construction	Monthly	C	SHEQO C	ECO SHEQO	EM PM
4	Storm water Management	Storm water shall be channelled away from construction activities.	Prior to commencement of Construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		No storm water may be discharged into areas where construction is taking place.	Prior to commencement of Construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Storm water flowing from the footprint of the proposed development may not be contaminated by any substances,	Throughout Construction	Weekly	C	C SHEQO	SHEQO ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		whether the substance is solid, liquid or vapour or any combination thereof.						
		During construction, the Contractor will protect areas susceptible to erosion by installing necessary temporary and / or permanent drainage works as soon as possible and by taking suitable measures to prevent surface water concentration into nearby roadways or river courses.	Prior to commencement of Construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Silt trap mechanisms will be installed on all temporary storm water channels. These silt traps will be regularly checked and serviced as required.	Throughout Construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		All excavated and filled slopes and stockpiles must be of a stable angle and capable of accommodating normal expected flows.	Throughout Construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Stabilisation of cleared areas to prevent and control erosion will be actively managed. The method chosen (e.g. watering, planting, retaining structures, commercial anti-erosion compounds) will be selected according to specifics and ensure acceptable rehabilitation.	Throughout Construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Traffic and movement over stabilised areas will be restricted. Any damage to stabilised areas will be repaired and maintained to the satisfaction of the Site Manager.	Throughout Construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Where erosion and sedimentation occur, rectification will be carried out in accordance with details specified by the Site Manager.	Throughout Construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
<b>Rehabilitation Phase</b>								
1	Storm water Management	Any runnels or erosion channels will be backfilled and compacted, and the areas restored to a proper condition.	Throughout Construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
<b>Operational Phase</b>								
None								

## 8.4 HAZARDOUS SUBSTANCE SPILLS

**Table 8-4: Environmental Management Measures for Hazardous Substance Spills**

Objectives		To ensure that spills occurring during the construction phase a suitably managed to reduce potential impacts on the environment.						
No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Hazardous Spills	Ensure that potential hazardous materials on site are identified and documented in a register.	Prior to site establishment	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Appropriate training for the handling and use of such materials is to be provided by the Contractor as necessary. This includes providing for any spills and pollution threats that may occur.	Prior to site establishment	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Products should be clearly labelled and symbolic safety/hazard warning signs should be provided.	Prior to site establishment	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Fuel and chemical depot(s) shall be located at least 100 m from any water body.	Prior to site establishment	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Ensure that suitable spill kits and absorption materials are purchased prior to commencement with construction, and stored suitably in places where there is a high risk of hazardous spills occurring.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
Construction Phase								
1	Hazardous Spills	All contaminated soil / yard stone shall be removed and be placed in containers. Contaminated material can be taken to one central point where bio-remediation can be done.	Throughout Project	When-necessary	C	C SHEQO	SHEQO ECO	EM PM
		Smaller spills can be treated on site. (ESKASABTO)	Throughout Project	When-necessary	C	C SHEQO	SHEQO ECO	EM PM
		A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site.	Throughout Project	When-necessary	C	C SHEQO	SHEQO ECO	EM PM
		Areas for the storage of fuel and other flammable materials shall comply with standard fire safety regulations.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
		The relevant Material Safety Data Sheets (MSDS) shall be available on site. Procedures detailed in the MSDS shall be followed in the event of an emergency situation.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM



No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site.	Throughout Project	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		All spills of hazardous substances must be reported to the ECO and appointed Transmission Engineering Environmental Advisor (Tx Key Performance Indicator requirement).	Throughout Project	When-necessary	C	C SHEQO	SHEQO ECO	EM PM
<b>Rehabilitation Phase</b>								
1	Hazardous Spills	Ensure that rehabilitated areas are free of visible spills and are suitably vegetated.	Throughout Project	When-necessary	C	C SHEQO	SHEQO ECO	EM PM
		Where hazardous substances is removed from site for disposal, proof of disposal for auditing purposes shall be kept in the form of disposal certificates.	Throughout Project	When necessary	C	C SHEQO	SHEQO ECO	EM PM
<b>Operational Phase</b>								
None								

## 8.5 DELIVERY OF MATERIALS

**Table 8-5: Environmental Management Measures for the delivery of materials.**

Objectives	<ul style="list-style-type: none"><li>To ensure that all sub-contractors responsible for delivering materials to site operate in an environmentally friendly manner whilst on site; and</li><li>To ensure that the activities related to material deliveries do not create an unnecessary impact on the environment.</li></ul>							

No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Heavy machinery	All drivers and operators must be appropriately licensed.	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
Construction Phase								
1	Heavy machinery	No vehicles coming on sites must spill oil.	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		No construction equipment, vehicles or unauthorised personnel will be allowed onto areas that have been re-vegetated.	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
Rehabilitation Phase								
1	Heavy Machinery	All areas where heavy machinery has access must be rehabilitated in terms of soil pollution.	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
Operational Phase								
1	Heavy Machinery	No oil/ petrol spills / leaks may occur.	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM

## 8.6 BUILDING, CIVIL'S AND STRUCTURAL STEEL WORK

**Table 8-6: Environmental Management Measures for building, civil's and Structural Steel Work**

Objective								
	<ul style="list-style-type: none"> <li>To ensure that all construction related activities including civils, building erection and structural steel work is undertaken in such a manner that it reduces unnecessary impact to the environment.</li> </ul>							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
<b>Pre-Construction Phase</b>								
None								
<b>Construction Phase</b>								
1	Excavate foundations	During excavations no oil leaks from heavy vehicles may occur.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
		PPE must be used by all workers using hand tools during the excavations of foundations.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
		Spoil must be evenly spread.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
2	Excavate earth moving materials	During the excavation of earth materials no oil leaks may occur from heavy vehicles.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
3	Mixing concrete	During the mixing of concrete, concrete dust is emanated. Workers mixing concrete must wear PPE.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
		Cement bags must not become litter after use. They must be disposed of in bins/skips (see Waste Management).	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
4	Trenches	All workers using hand tools must make use of PPE.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
		No spills may occur. All spills should be reinstated into foundations as backfill.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
5	Cast Blinding Layer	No concrete spills may occur. All spills should be reinstated into foundations as backfill.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
6	Place Copper Earthing	All copper off-cuts must be collected for recycling purposes.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
7	Construct Cable	No concrete spills may occur. All spills should be reinstated into foundations as backfill.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
8	Place steelwork on foundations	All steel off-cuts must be collected for recycling purposes.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
		During steel cutting and grinding, all old discs must be managed and must not become litter.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
9	Connect earthing to steelwork	During welding and brazing, all old welding rods must be managed and must not become litter.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
10	Reinstate yard stone	No oils spills may occur as a result of heavy vehicles.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
		Workers with rakes must use PPE at all times.	Throughout construction	Daily	C	C SHEQO	SHEQO ECO	EM PM
Rehabilitation Phase								
1	De-establish contractors yard / store	All waste, garbage, surplus materials and oils spills to be cleared and site must be rehabilitated.	During Rehabilitation	Once-off	C	C SHEQO	SHEQO ECO	EM PM
2	Final inspection	During site inspection the site is to be cleared and rehabilitated back to its original state.	During Rehabilitation	Once-off	C	C SHEQO	SHEQO ECO	EM PM
Operational Phase								
1	Take over works	During site take / hand over the site must be accepted from the contractor and handed over.	Operations	Once - off	C	C SHEQO	SHEQO ECO	EM PM

## 8.7 CIRCUIT BREAKERS AND CURRENT TRANSFORMERS

**Table 8-7: Environmental Management Measures for Circuit Breakers and Current Transformers.**

Objective								
	<ul style="list-style-type: none"> <li>See deliveries, site establishment, and civils and structural steel work.</li> </ul>							

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
<b>Pre-Construction Phase</b>								
1	Supply and delivery of new circuit breakers and current transformers	All drivers and operators delivering new circuit breakers and current transformers must be licensed to obey all road and local by-laws.	Throughout Project	Once-off	C	C SHEQO	SHEQO ECO	EM PM
<b>Construction Phase</b>								
1	Establish contractor on site	(See Site Establishment).						
2	Install new cables, clamps and conductors	The crane operators must be licensed in accordance with the OHS Act.	Throughout Project	Once-off	C	C SHEQO	SHEQO ECO	EM PM
<b>Rehabilitation Phase</b>								
1	Clear site	The site must be cleared and rehabilitated so that there is no damage to the surrounding infrastructure.	Post construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		All personal must be suitably accredited to perform duties.	Throughout Project	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		All cable cut offs must be collected and sent for recycling.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
		All waste, garbage, scrap and oil spill must be disposed of (see Waste Management). The site must be cleared and rehabilitated.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
2	Final Inspection	During site inspection the site is to be cleared and rehabilitated back to its original state.	On termination of construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM
<b>Operational Phase</b>								
1	Take over works	During site take / hand over the site must be accepted from the contractor and handed over.	On termination of construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM

## 8.8 ACCESS ROADS

**Table 8-8: Environmental Management Measures for Access Roads.**

Objectives	<ul style="list-style-type: none"><li>Adhere to Eskom standards for access roads and gates;</li><li>Minimise damage to existing access roads;</li><li>Minimise damage to environment due to construction and rehabilitation of new access roads; and</li><li>Minimise loss of topsoil and enhancement of erosion.</li></ul>							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Access Roads	If required, planning of access routes must be done in conjunction between the Contractor, landowner and Eskom.	Once off	As necessary	PM	PM C	ECO	EM
		All agreements reached shall be documented in writing and no verbal agreements should be made.	Throughout Project	Throughout Project	C	PM C	ECO	EM PM
		The condition of existing access / private roads to be used shall be documented with photographs.	Prior to construction	Once-off	C ECO	C SHEQO	SHEQO ECO	EM PM
		The Contractor shall properly mark all access roads.	Prior to construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Markers shall show the direction of travel.	Prior to construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Roads not to be used shall be marked with a <b>"NO ENTRY"</b> sign (refer also TRMSCAAC1 REV 3).	Prior to construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Where required, speed limits shall be indicated and speed control measures applied on the roads.	Prior to construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Water diversion berms shall be installed from the start of the contract in accordance with TRMSCAAC1 REV 3 Section 4.6.	Prior to construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		Where berms are installed on severe slopes the outflow shall be suitably stone pitched to prevent erosion from starting at the base of the berm.	Prior to construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		All structures shall be properly designed and drawings shall be available for reference purposes.	Prior to construction	Once-off	PM	C SHEQO	SHEQO ECO	EM PM
		Permanently wet areas are shown on the profiles. No vehicular traffic shall be allowed in such areas. Only existing roads through such areas may be used with the approval of Eskom and the Landowner.	Throughout construction		C	C SHEQO	SHEQO ECO	EM PM
Construction Phase								
1	Access Roads	All speed limits shall be strictly adhered to at all times.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
		Where new access roads are constructed, this must be done in accordance with TRMSCAAC1 REV 3 or any subsequent updates.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		Berms shall be maintained at all times.	Throughout construction	Monthly inspection	C	C SHEQO	SHEQO ECO	EM PM
		No roads shall be constructed on slopes of more than 20% unless such roads follow contours.	Throughout construction	Monthly inspection	PM C	PM C	EM ECO	SHEQO
		In such areas the Contractor shall only use existing roads or alternative methods of construction. The Contractor shall take such areas into consideration during the tender.	Throughout construction	Monthly inspection	C	C SHEQO	SHEQO ECO	EM PM
		The installation of concrete pipes and drifts, to facilitate access, shall be at the discretion of the Environmental Control Officer on site.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		Any dangerous crossings shall be marked as such and where necessary, speed limits shall be enforced.	Throughout construction	Monthly inspection	C	C SHEQO	SHEQO ECO	EM PM
		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.	Throughout construction	Monthly inspection	C	C SHEQO	SHEQO ECO	EM PM
Rehabilitation Phase								
1	Access Roads	Berms must be repaired at the end of the contract.	End of contract	Once off	C	C SHEQO	SHEQO ECO	EM PM
		Upon completion of the project all roads shall be repaired to their original state.	End of contract	Once off	C	C SHEQO	SHEQO ECO	EM PM
Operational Phase								
None.								

## 8.9 WASTE MANAGEMENT

**Table 8-9: Environmental Management Measures for waste management.**

Objectives	<ul style="list-style-type: none"><li>To keep the construction site and servitude neat and clean.</li><li>Disposal of rubble and refuse in an appropriate manner</li><li>Minimise litigation</li><li>Minimise neighbour complaints</li><li>No visible concrete spillage on the servitude</li></ul>								
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed	
Pre-Construction Phase									
1	Refuse and Rubble Removal	A method statement is required from the Contractor that includes the layout of the camp, management of ablution facilities and waste management.	Prior to construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM	
		The Contractor camp shall have the necessary ablution facilities with chemical toilets where such facilities are not available at commencement of construction.	Prior to construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM	
		The Contractor shall provide a wastewater management system that will comply with legal requirements and be acceptable to Eskom.	Prior to construction	Weekly inspection	C	C SHEQO	SHEQO ECO	EM PM	
		The Contractor will supply waste collection bins where such is not available and all solid waste collected shall be disposed of at a registered waste disposal facility.	Throughout Project	Once-off	C	C SHEQO	SHEQO ECO	EM PM	
		A certificate of disposal shall be obtained by the Contractor and kept on site. All waste generated during construction and operation of the facility must be removed and disposed of at a waste disposal facility permitted in terms of Section 20 of the Environment Conservation Act, 1989 (Act 73 of 1989);	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM	
		In the case where a registered waste site is not available close to the construction site, the Contractor will be responsible to provide a method statement with regard to waste management.	Prior to construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM	
		Under no circumstances may solid waste be burned on site unless a suitable incinerator is available.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM	
		The Contractor shall supply waste collection bins where such is not available, as approved by the Environmental Control Officer, and all solid waste collected shall be disposed of at a registered waste dump.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM	
		A certificate of disposal shall be obtained by the Contractor and kept on file.	Prior to construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM	
		Where a registered waste site is not available close to the construction site,	Prior to	Once-off	C	C	SHEQO	EM	



No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
		the Contractor shall provide a method statement with regard to waste management.	construction			SHEQO	ECO	PM
		The disposal of waste shall be in accordance with all relevant legislation.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
<b>Construction Phase</b>								
1	Refuse and Rubble Removal	The Contractor shall dispose of all excess material on site in an appropriate manner and at a designated place.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		All packaging material shall be removed from site and disposed of and not burned on site.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		No landfill may be used without the consent from the Landowner.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		Should a landfill be used for biodegradable materials only, the rubble shall be compacted and at least 1m of soil shall cover the waste material.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		No hazardous material, e.g. oil or diesel fuel shall be disposed of in any unregistered waste site.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		No material shall be left on site that may harm man or animals.	Throughout Project	Weekly inspection	C	C SHEQO	SHEQO ECO	EM PM
		Any broken insulators shall be removed and all shards picked up.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
		Broken, damaged and unused nuts, bolts and washers shall be picked up and removed from site.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
		Surplus concrete may not be dumped indiscriminately on site, but shall be disposed of in designated areas as agreed by the Landowner. Concrete trucks shall not be washed on site after depositing concrete into foundations. Any spilled concrete shall be cleaned up immediately.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Under no circumstances may solid waste be burned on site unless a suitable incinerator is available.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
		The Contractor shall dispose of all excess material on site in an appropriate manner and at a designated place.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		All packaging material must be removed from the site and disposal of and not burned on site.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		No material shall be left on site that may harm man or animals.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		Any broken insulators shall be removed and all shards picked up.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		Broken, damaged and unused nuts, bolts and washers shall be gathered and removed from site.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
		Surplus concrete may not be dumped indiscriminately on site and will be disposed of in designated areas as agreed by the Landowner.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		The washing of concrete trucks on site is prohibited. Any spilled concrete shall be cleaned up immediately.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		The Contractor must provide DEAT with proof of confirmation of service provision from waste service providers for the removal of wastes.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		A general site-wide litter clean up will occur at least once a week.	Throughout Project	Weekly	C	C SHEQO	SHEQO ECO	EM PM
		Waste will be collected from site by a licensed contractor and removed to an appropriate waste disposal facility.	Throughout Project	Weekly	C	C SHEQO	SHEQO ECO	EM PM
		Wherever possible, materials will be recycled via a "Greens waste site". To this end, containers for glass, paper, metals, plastics, organic waste and hazardous wastes (e.g. oil rags, paint containers, thinners) will be provided in sufficient quantity on the site.	Throughout Project	Weekly	C	C SHEQO	SHEQO ECO	EM PM
		Waste will be removed during off-peak traffic periods to minimise impacts on local traffic patterns.	Throughout Project	Weekly	C	C SHEQO	SHEQO ECO	EM PM
		All waste generated during construction and operation of the facility must be removed and disposed of at a waste facility permitted in terms of Section 20 of the Environmental Conservation Act, 1989 (Act 73 of 1989).	Throughout Project	Weekly	C	C SHEQO	SHEQO ECO	EM PM
		Littering by the employees of the Contractor shall not be allowed (TRMSCAAC1 REV 3 section 4.1.2).	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
		All potentially hazardous and non-degradable waste shall be collected and removed to a registered waste site.	Throughout Project	Weekly	C	C SHEQO	SHEQO ECO	EM PM
<b>Rehabilitation Phase</b>								
1	Refuse and Rubble Removal	Same as construction phase.						
<b>Operational Phase</b>								
1	Refuse and Rubble Removal	Same as construction phase.						

## 8.10 FIRE PREVENTION

**Table 8-10: Environmental Management Measures for Fire Prevention.**

Objectives	<ul style="list-style-type: none"><li>No veld fires started by the Contractor's work force.</li><li>No claims from Landowners for damages due to veld fires.</li><li>No litigation.</li></ul>							
------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	--	--	--	--	--

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Fire Prevention	The Contractor shall have fire-fighting equipment available on all vehicles working on site, especially during the winter months.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		The Contractor will document a fire reduction management plan. The plan will identify sources of fire hazard, and appropriate management measures to reduce the identified risk. The relevant authority will be notified of such potential fire hazards.	Prior to commencement of construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
Construction Phase								
1	Fire Prevention	Preferentially no fires will be lit on the site, if however required, fires must be limited to use for cooking and heating use only within a designated area. This area will be a suitable distance from fuel sources. A fire will be constantly monitored while present.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
		In terms of the Atmospheric Pollution Prevention (APPA), burning is not permitted for waste disposal.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		Suitable precautions will be taken (e.g. suitable fire extinguisher, welding curtains) when working with welding or grinding equipment near potential sources of combustion.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
		All fire control mechanisms (fire fighting equipment) will be routinely inspected by a qualified investigator for efficacy thereof and be approved by local fire services. Such mechanisms will be present and accessible at all times.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		All staff on site will be made aware of general fire prevention and control methods, and the name of the responsible person to alert to the presence of a fire.	Throughout Project	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		The Contractor will advise the relevant authority of a fire outside of a demarcated area as soon as it starts and will not wait until he	Throughout Project	When necessary	C	C SHEQO	SHEQO ECO	EM PM

		can no longer control it.						
<b>Rehabilitation Phase</b>								
1	Fire Prevention			None.				
<b>Operational Phase</b>								
1	Fire Prevention			None.				

## 8.11 DESIGNATED STORAGE AREAS

**Table 8-11: Environmental Management Measures for Designated Storage Areas.**

<b>Objective</b>	<ul style="list-style-type: none"> <li>To ensure that cognisance is taken of proper storage of dangerous goods and hazardous materials so as to avoid accidents, spillage, and impacts to the environment.</li> </ul>							

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Workshop, equipment maintenance and storage	Where possible and practical all maintenance of vehicles and equipment shall take place in the workshop area, on a paved or concrete lined surface.	During construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		All hazardous substances shall be stored in suitable containers and storage areas shall be bunded. This includes all carbon substances like fuel and oil as well as herbicides and battery acid.	During construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		A register shall be kept on all substances and be available for inspection at all times.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
Construction Phase								
1	Workshop, equipment maintenance and storage	Servicing of vehicles within Substation perimeters is strictly prohibited.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		Only emergency repairs shall be allowed on site and a drip tray shall be used to prevent oil spills.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
		In the event of a breakdown within the substation perimeter, any oil spills shall be cleaned up immediately and appropriate environmental investigations undertaken and recorded.	Throughout Project	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		The following shall apply:						
		<ul style="list-style-type: none"><li>All contaminated soil shall be removed and be placed in containers. Contaminated soil can be taken to one central</li></ul>	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		point at the Contractors campsite where bio-remediation can be done; <ul style="list-style-type: none"> <li>Smaller spills can be treated on site;</li> <li>A specialist Contractor shall be used for the bio-remediation of contaminated soil;</li> <li>The area around the fuel storage drum at the Contractor's campsite shall also be re-mediated upon completion of the contract; and</li> <li>All oil spills must be reported to ECO immediately.</li> </ul>						
		Under no circumstances shall such waste be buried on site indiscriminately.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		No maintenance or repair of construction vehicles or machinery will occur on site during the construction phase. Maintenance of equipment and vehicles will be performed off-site at a suitably designed workshop.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Movement of construction vehicles and machinery must be restricted to areas outside of sensitive areas on site.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		No washing of plant may occur on the site.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		The contractor will ensure that if emergency plant maintenance occurs on site, that there is no contamination of soil or vegetation (e.g. use of drip trays).	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Drip trays will be provided for the stationary plant and for the "parked" plant.	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		All vehicles and equipment will be kept in good working order and serviced regularly. Leaking equipment will be repaired immediately or removed from the site.	Throughout Project	Daily	C	C SHEQO	SHEQO ECO	EM PM
		The relevant contractor must ensure that facilities for the collection of hydraulic and other vehicle oils are provided within the hard park area.	Throughout Project	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		The repair of construction vehicles must be done on a paved surface to avoid leaking oils seeping into the ground.	Throughout Project	When necessary	C	C SHEQO	SHEQO ECO	EM PM
2	Materials use, handling and storage	The Contractor will ensure that delivery drivers are informed of all procedures and restrictions required by this document. Such drivers will be supervised during off-loading, by a person knowledgeable of the requirements.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Materials will be appropriately secured to ensure safe passage between destinations. Loose loads (e.g. sand, stone chip, fine	Throughout Project	Throughout	C	C SHEQO	SHEQO ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		vegetation, refuse, paper and cement) will be covered.						
		The Contractor will be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.	Throughout Project	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		All material lay-down areas and stockpiles will be subject to the Site Manager's approval.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Imported fill / soil / sand materials will be free of weeds, litter and contaminants.	Throughout Project	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		Storage areas will be roofed in an impervious material, with a suitable overhang or side cladding. Rainwater run-off will be channelled away from the storage area as required.	Throughout Project	Once-off	C	C SHEQO	SHEQO ECO	EM PM
		Hydraulic fluids are stored in concrete lined surfaces with bund walls and must be designated in such a manner that any spillages can be contained and reclaimed without any impact on the surrounding environment.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Hazardous and flammable substances must be stored and used in compliance with applicable regulations and safety instructions.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		During servicing of vehicles or equipment, a suitable drip tray shall be used to prevent spills onto the soil, especially where emergency repairs are affected outside the workshop area.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Leaking equipment shall be repaired immediately or be removed from site to facilitate repair.	Throughout Project	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		Areas shall be monitored for spills and any spills shall be contained, cleaned and rehabilitated immediately.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Any leaking containers shall be repaired or removed from site.	Throughout Project	When necessary	C	CSHEQO	SHEQO ECO	EM PM
<b>Rehabilitation Phase</b>								
1	Servicing of Vehicles	None.						
<b>Operational Phase</b>								
1	Servicing of Vehicles	None.						

## 8.12 TOWER POSITIONS

**Table 8-12: Environmental Management Measures for Tower Positioning.**

Objectives	<ul style="list-style-type: none"><li>Minimise damage to topsoil and environment at tower positions</li><li>Successful rehabilitation of all damaged areas</li><li>Prevention of erosion and no visible erosion scars three months after completion of the contract</li></ul>								
	No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
Pre-Construction Phase									
1	Tower positioning	Refer to TRMSCAAC1 REV 3 SECTION 4.4.5 for specifications concerning tower sites on slopes.	Prior to construction	Once-off	PM C	C SHEQO	PM C	EM PM	
Construction Phase									
1	Tower Positioning	Disturbance of topsoil on tower sites with severe slopes shall be minimised at all costs.	Throughout Project	Throughout	C PM	C SHEQO	ECO	EM PM	
		At any tower sites where conventional foundations are installed, the Contractor shall remove the topsoil separately and store it for later use during rehabilitation of such tower sites.	Throughout Project	Monthly	C PM	C SHEQO	ECO	EM PM	
		During backfilling operations, the Contractor shall take care not to dump the topsoil in the bottom of the foundation and then put spoil on top of that.	Throughout Project	Monthly	C	C SHEQO	ECO	EM PM	
		In accordance with the Conservation of Agricultural Resources Act, No 43 of 1983, slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced.	Throughout Project	When necessary	C	C SHEQO	SHEQO ECO	EM PM	
		Contour banks shall be spaced according to the slope on tower sites. The type of soil shall also be taken into consideration.	Throughout Project	Monthly	C	C SHEQO	SHEQO ECO	EM PM	
Rehabilitation Phase									
1	Tower Positioning	Re-seeding shall be done on disturbed areas as directed by the Environmental Control Officer.	Post construction	When necessary	C	C SHEQO	ECO	EM PM	
		Other methods of rehabilitation of tower sites may also be used at the discretion of the Environmental Control Officer, e.g. stone pitching, logging, etc.	When necessary	When necessary	C	C SHEQO	ECO	EM PM	
		A mixture of seed can be used provided the mixture is carefully selected to ensure the following: <ul style="list-style-type: none"><li>Annual and perennial plants are chosen;</li><li>Pioneer species are included;</li><li>All the plants shall not be edible;</li></ul>	Throughout Project	When necessary	C	C SHEQO	ECO	EM PM	

		<ul style="list-style-type: none"> <li>Species chosen will grow in the area without many problems;</li> <li>Root systems must have a binding effect on the soil; and</li> <li>The final product should not cause an ecological imbalance in the area.</li> </ul>						
		To get the best results in a specific area, it is a good idea to consult with a vegetation specialist or the local extension officer of the Dept of Agriculture. Seed distributors can also give valuable advice as to the mixtures and amount of seed necessary to seed a certain area. Re-seeding, as well as fencing in of badly damaged areas, will always be at the discretion of the Environmental Control Officer, unless specifically requested by a Landowner.	Post construction	When necessary	C	SHEQO ECO	ECO SHEQO	EM PM
<b>Operational Phase</b>								
1	Tower Positioning	None.						



### 8.13 CLAIMS FROM DAMAGES

**Table 8-13: Environmental Management Measures for Claims from Damages.**

Objectives	<ul style="list-style-type: none"><li>Minimise complaints from Landowners</li><li>Prevent litigation due to outstanding claims by ensuring that claims are settled within one (1) month.</li><li>Successful completion of the contract and all Landowners signing release forms within 6 months of completion of the project.</li></ul>							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Claims from Damages	None.						
Construction Phase								
1	Claims from Damages	All damage to Eskom property shall be recorded immediately.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		The Environmental Control Officer must keep a photographic record of such damage.	When necessary	When necessary	ECO	ECO	SHEQO ECO	EM PM C
		The date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure the responsible party is held liable.	Throughout construction	When necessary	ECO	ECO	SHEQO ECO	EM PM C
		All claims for damage should be directed to the Environmental Control Officer for appraisal.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		The Contractor shall be held liable for all unnecessary damage to Eskom property.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		A register shall be kept of all complaints from Landowners.	Throughout construction	Monthly	ECO	ECO	SHEQO ECO	EM PM C
		All claims shall be handled immediately to ensure timeous rectification / payment.	Throughout construction	When necessary	ECO	ECO	SHEQO ECO	EM PM C
Rehabilitation Phase								
1	Claims from Damages	None.						
Operational Phase								
1	Claims from Damages	None.						

## 8.14 EROSION, DONGA AND RIVER CROSSINGS

**Table 8-14: Environmental Management Measures for Erosion, Donga and River Crossings.**

Objectives	<ul style="list-style-type: none"><li>Minimise erosion damage on donga crossings and embankments. There should be no visible damage caused by construction activities.</li><li>Minimise impeding the natural flow of water</li><li>Minimise initiation of erosion through donga embankments</li></ul>							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Erosion and donga Crossings	Crossing of dongas and eroded areas shall be thoroughly planned in accordance with TRMSCAAC1 REV 3 Section 4.4.1.	Prior to construction	Once-off	PM	PM EM	ECO EM	C SHEQO
		All structures shall be properly designed and drawings shall be available for reference purposes.	Prior to construction	Once-off	PM	PM EM	ECO EM	C SHEQO
2	River Crossings	Existing drifts and bridges may be used if the Landowner gives his consent. Such structures shall then be thoroughly examined for strength and durability before they are used.	Prior to construction	Once-off	C	C SHEQO	ECO EM	EM PM
		New drifts and bridges shall only be constructed with the approval of Eskom and the Landowner and at the discretion of the ECO.	Prior to construction	Monthly	C	SHEQO C	ECO	EM PM
		All structures constructed for access purposes shall be properly designed and drawings of such structures shall be available for record purposes.	Prior to construction	Once-off	C	C SHEQO	SHEQO ECO	EM PM
Construction Phase								
1	Erosion and Donga Crossings	Water diversion berms shall be installed at donga crossings to ensure runoff water does not run into dongas and cause an erosion hazard.	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Suitable erosion containment structures shall be constructed at donga crossings where required and viable.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		No unplanned / improperly planned cutting of donga embankments is allowed as this leads to erosion and degradation of the environment.	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM
2	River Crossings	No roads shall be cut through river and stream banks as this may lead to erosion causing siltation of streams and downstream dams.	Prior to construction	Throughout	C C	C SHEQO	ECO	EM PM
Rehabilitation Phase								
1	Erosion and Donga Crossings	None.						
Operational Phase								
1	Erosion	None.						

## 8.15 FLORA MANAGEMENT (INCLUDING VEGETATION CLEARING, GENERAL, AND HERBICIDES)

**Table 8-15: Environmental Management Measures for Flora Management.**

Objective	<ul style="list-style-type: none"><li>Minimise damage to vegetation by only clearing vegetation along the centre of the servitude for access purposes.</li><li>Keep servitude as natural looking as possible.</li><li>No vegetation interfering with structures and statutory safety requirements upon completion of the contract.</li><li>Minimise possibility of erosion due to removal of vegetation by not de-stumping vegetation on river and stream embankments.</li><li>Minimise removal of plant material on river and stream embankments.</li><li>Eradication of alien invader and densifier species that cause a fire hazard.</li><li>No visible herbicide damage to the vegetation along the servitude one year after completion of the contract due to incorrect herbicide use.</li><li>No litigation due to unauthorised removal of vegetation.</li></ul>								
	No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
	Pre-Construction Phase								
	1	Vegetation Clearing	Vegetation clearing shall be done in accordance with ESKASABG3 REV 0 (Standard for bush clearance and maintenance within overhead power line servitudes) and the Vegetation Management Guideline.	Prior to construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
			The removal of all economically valuable trees or vegetation shall be negotiated with the Landowner before such vegetation is removed.	Prior to construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
			The Contractor will remove plants containing any diseases and /or pests from the site.	Prior to construction	Weekly	C	C SHEQO	SHEQO ECO	EM PM
	Construction Phase								
1	Vegetation Clearing	Only an 8m strip may be cleared to allow vehicular passage during construction.	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM	
		The removal of indigenous plant material from the site or surrounding and adjacent land will not be allowed.	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM	
		No scalping shall be allowed on any part of the servitude road unless absolutely necessary.	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM	
		All trees and vegetation cleared from the site shall be cut into manageable lengths and neatly stacked at regular intervals along the line.	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM	
		No vegetation shall be pushed into heaps or left lying all over the servitude.	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM	
		Vegetation clearing on tower sites must be kept to a minimum.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM	
		Big trees with large root systems shall be cut manually and removed, as the use of a bulldozer will cause major damage to the soil when the root	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM	

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		systems are removed.						
		Stumps shall be treated with herbicide.	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Smaller vegetation can be flattened with a machine, but the blade should be kept above ground level to prevent scalping.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		Any vegetation cleared on a tower site shall be removed or flattened and not be pushed to form an embankment around the tower.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		No vegetation clearing in the form of de-stumping, scalping or uprooting shall be allowed on river and stream banks.	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		Vegetation shall only be cut to allow for the passage of the pilot-cables and headboard.	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		No vegetation clearing shall be allowed across ravines and gullies, as this vegetation will very rarely interfere with the clearance to the strung conductor.	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		Trees and vegetation not interfering with the statutory clearance to the conductors can be left under the line.	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		Dense vegetation under the line which could cause a fire hazard, particularly in the middle third of the span in the vicinity of the lowest point of the conductors, will be considered as a separate case.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		With permission of the landowner, the total servitude under the line and up to 5m outside the outer phases can be cleared.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		Protected or endangered species of plants shall not be removed unless they are interfering with a structure.	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		Where such species have to be removed due to interference with a structure, the necessary permission and permits shall be obtained from Provincial Nature Conservation.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		All protected species not to be removed must be clearly marked and such areas fenced off if required.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		The use of herbicides shall only be allowed after a proper investigation into the necessity, the type to be used, the long-term effects and the effectiveness of the agent. Eskom's approval for the use of herbicides is mandatory (Contact Dr. Eugene van Rensburg—Vegetation Management).	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		Application shall be under the direct supervision of a qualified technician. All surplus herbicide shall be disposed of in accordance with the supplier's specifications.	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM
		Upon completion of the stringing operations and before handover, the servitude must be inspected and all vegetation interfering with the safe	Throughout construction	Monthly	C	C SHEQO	SHEQO ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		operation of the line shall be removed / cut down.						
		<p>All alien vegetation in the total servitude and densifiers creating a fire hazard shall be cleared and treated with herbicides. (Refer to the Vegetation Management Guideline attached).</p> <ul style="list-style-type: none"> <li>The application shall be according to set specifications and under supervision of a qualified technician.</li> <li>The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used.</li> </ul>	Throughout construction	Weekly	C	C SHEQO	SHEQO ECO	EM PM
		<p>It is recommended that a contractor for vegetation clearing should comply with the following parameters:</p> <ul style="list-style-type: none"> <li>The contractor must have the necessary knowledge to be able to identify protected species as well as species not to be interfering with;</li> <li>The operation of the line due to their height and growth rate;</li> <li>The contractor must also be able to identify declared weeds and alien species that can be totally eradicated; and</li> <li>The contractor must be in possession of a valid herbicide applicators license.</li> </ul>	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM
		The removal of protected vegetation and medicinal plants during construction must be done in consultation with the provincial environmental authorities, and the appropriate post-construction rehabilitation measures must be implemented in cooperation with the provincial environmental authorities.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
2	Harvesting of Medicinal Plants	The removal of protected vegetation and medicinal plants during construction must be done in consultation with the provincial environmental authorities, and the appropriate post-construction rehabilitation measures must be implemented in cooperation with the provincial environmental authorities.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		Should Medicinal Plants be found on site, these plants will be demarcated and cordoned off.	Throughout construction	When necessary	C	C SHEQO	SHEQO ECO	EM PM
		Once demarcated, they will be removed and translocated to an established nursery. The plants shall be removed by a certified Nursery with experience in the handling and translocation of plants. The South African National Biodiversity Institute (SANBI) shall be contacted for assistance should a certified nursery not be available.	Throughout construction	When necessary				
3	Protection of	Removal of indigenous plant material from the site or surrounding and	Throughout	Throughout	C	C	SHEQO	EM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
	Indigenous Vegetation	adjacent land will not be allowed;	construction			SHEQO	ECO	PM
		Only indigenous vegetation is to be used in any landscaping which may be undertaken;	Throughout construction	Throughout	C	C SHEQO	SHEQO ECO	EM PM
4	Search and Rescue of Endangered Plant Species	Should Protected or Endangered Plant Species be found on site they will be demarcated and cordoned off. An Ecological Management Plan will be compiled and submitted to DEAT for approval. The Ecological Management Plan will include the following: <ul style="list-style-type: none"> <li>• Ensure the persistence of the plant species;</li> <li>• Include a monitoring programme that monitors the size, stage structure and vigour of the plant species population and threats to the population;</li> <li>• Facilitate/augment natural ecological processes such as fire and herbivory;</li> <li>• Provide for the habitat and life history needs of important pollinators;</li> <li>• Minimise artificial edge effects (e.g. water runoff from developed areas and application of chemicals);</li> <li>• Include an ongoing monitoring and eradication programme for non-indigenous/alien invasive species;</li> <li>• Result in a Report to be submitted to the relevant authority (GDACE, DEAT, etc)</li> <li>• Where feasible, appropriate genetic material such as seeds or propagules of the plant species shall be collected and stored at a licensed facility.</li> </ul>	Throughout construction	When necessary	PM	EM ECO	ECO SHEQO	C
		• In situ conservation of Protected and Endangered Plant Species is preferable to ex situ conservation. Thus, should the plant species not “interfere” with the construction of a structure, the area surrounding the plant species shall be declared a “no-go” area as outlined in the Ecological Management Plan; and	Throughout construction	Throughout	PM	EM ECO	ECO SHEQO	C
		• The area surrounding the plant species shall be declared a “No-go” area and a buffer zone will be applied as outlined in the Ecological Management Plan;			PM	EM ECO	ECO SHEQO	C
5	Alien Plant Control and Monitoring	The Developer will be responsible for controlling all alien invasive species, as per the requirements of the Conservation of Agricultural Resources Act (CARA), during the contract and vegetation establishment period;	Throughout construction	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		All exotic trees will be identified and marked;	Throughout construction	When necessary	PM	C SHEQO	SHEQO ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		Alien invasive plant material will be preferentially removed in entirety through mechanical means (e.g. chainsaw, bulldozer, hand-pulling of smaller specimens);	Throughout construction	When necessary	PM	C SHEQO	SHEQO ECO	EM PM
		The exotic trees must be cut down leaving the stumps behind to ensure that soil erosion is prevented; The trees can be chipped on site and the chips seeded with indigenous vegetation and spread over the site to allow for re-growth and to reduce erosion potential;	Throughout construction	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		Immediately after being cut, a herbicide solution must be applied to the exotic trees to ensure no further growth. The person applying the herbicide must have read and understood the instructions. Care must be taken that there is no spillage of solution in the wetland and that the correct protective equipment must be used;	After being cut – immediately	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		If plants are not removed in entirety but cut-back and systematically treated with approved herbicides, then remaining plant will be monitored for re-growth / re-establishment;	Throughout construction	Monthly	PM	C SHEQO	SHEQO ECO	EM PM
		Herbicides used must be approved by authorities and as per the supplier's specifications;	When necessary	Once-off	PM	C SHEQO	SHEQO ECO	EM PM
		Alien invasive plant material will not be stockpiled. All such material removed will be removed from the site and dumped at an approved disposal site;	Throughout construction	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		If during the establishment period any noxious or excessive weed growth occurs, such vegetation will be removed; and	Throughout construction	When necessary	PM	C SHEQO	SHEQO ECO	EM PM
		It is the developer's responsibility to implement a monitoring programme that will be instituted to ensure that re-growth of alien invasive plants species does not occur, or that such re-growth is controlled.	Throughout construction	Monthly	PM	C SHEQO	SHEQO ECO	EM PM
Rehabilitation Phase								
1	Traffic on rehabilitated areas.	If disturbed areas are left to rehabilitate naturally, they must be frequently monitored and interventions put in place immediately should it become necessary. Special attention must be given to the potential for soil erosion and the associated environmental degradation. It is also essential to undertake alien vegetation control and management.	Post construction	Monthly	PM	C SHEQO	SHEQO ECO	EM PM
		No construction equipment, vehicles or unauthorised personnel will be allowed onto areas that have been re-vegetated	Throughout construction	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		Only persons / equipment required for maintenance thereof will be allowed to operate on such areas.	Throughout construction	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
2	Plant Material	All plant material used on site will be obtained from an approved nursery;	Post	Throughout	PM	C	SHEQO	EM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
			construction			SHEQO	ECO	PM
		The Contractor will remove plants containing any diseases and/or pests from the site;	Throughout construction	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		Propagation of suitable indigenous vegetation that is quick to establish such as grasses, should be encouraged in areas where vegetation has been removed	Throughout construction	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		On planting, there will be sufficient topsoil around each plant to prevent desiccation of the root system. Where plants are stored on site prior to planting they will be maintained to ensure that the root systems remain moist; and	Throughout construction	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		Each plant brought onto site will be handled and packed in an approved manner for that species or variety, and that all necessary precautions are taken to ensure that the plants arrive on the site in a proper condition for successful growth (e.g. good plant specimens chosen, disease and/or pest free, potting material weed free, plants covered during transportation, containers in good condition);	Throughout construction	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
3	Reseeding of Disturbed Areas	All reseeding activities will be undertaken at the end of the dry season (middle to end September) to ensure optimal conditions for germination and rapid vegetation establishment;	Throughout construction	Wet Season	PM	C SHEQO	SHEQO ECO	EM PM
		The seed mix will be approved by the ECO prior to seeding;	Throughout construction	Wet Season once-off	PM	C SHEQO	SHEQO ECO	EM PM
		Seeds should be covered by use of an agricultural roller or similar mechanism;	Throughout construction	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		Inspect rehabilitated area at three monthly intervals during the first and second growing season to determine the efficacy of rehabilitation measures; and	Throughout construction		PM	C SHEQO	SHEQO ECO	EM PM
		Take appropriate remedial action where vegetation establishment has not been successful or erosion is evident within the first two growing seasons.	Throughout construction		PM	C SHEQO	SHEQO ECO	EM PM
4	Alien Plant Control and Monitoring	Alien plant control will be conducted as described in Section 5.14, for a period of two years after the rehabilitation phase is completed.	Throughout construction		PM	C SHEQO	SHEQO ECO	EM PM
5	Soil and Land Capability	All excess building material and rubble must be collected and disposed of at a suitably registered landfill site.	Throughout construction		PM	C SHEQO	SHEQO ECO	EM PM
		Soils must be ripped to refusal or a minimum of 300mm prior to seeding.	Throughout construction		PM	C SHEQO	SHEQO ECO	EM PM
		All areas must be profiled to tie in with adjacent terrain. Where necessary	Throughout		PM	C	SHEQO	EM



No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		suitable soil must be imported obtain a suitable profile.	construction			SHEQO	ECO	PM
		Suitable erosion control measures must be installed in areas where erosion may occur;	Throughout construction		PM	C SHEQO	SHEQO ECO	EM PM
		Apply a suitable mixture of N:P:K fertiliser prior to seeding;	Throughout construction		PM	C SHEQO	SHEQO ECO	EM PM
		Harrow the disturbed areas after spreading the topsoil and fertilizer uniformly;	Throughout construction		PM	C SHEQO	SHEQO ECO	EM PM
		Rehabilitated and profiled areas must be inspected for erosion every three months for the first two years. Additional measures must be implemented to remediate erosion where it is observed.	Throughout construction		PM	C SHEQO	SHEQO ECO	EM PM
Operational Phase								
1	Vegetation Clearing	None						

## 8.16 FAUNA MANAGEMENT

**Table 8-16: Environmental Management Measures for Fauna Management.**

Objectives	<ul style="list-style-type: none"> <li>Minimise disruption of farming activities (No stock losses where construction is underway);</li> <li>Minimise disturbance of animals;</li> <li>Minimise interruption of breeding patterns of birds; and</li> <li>No litigation concerning stock losses and animal deaths.</li> </ul>							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
<b>Pre-Construction Phase</b>								
1	Planning	Construction planning must be undertaken prior to construction to ensure that it does not conflict with breeding seasons.	One week	Once off	PM	C SHEQO	SHEQO ECO	EM PM
		The breeding sites of raptors and other wild bird species shall be taken into consideration during the planning of the construction programme.	One week	Once off	PM	C SHEQO	SHEQO ECO	EM PM
		<i>There are many instances where protected and endangered species of birds are nesting on our transmission towers without causing any problems to the flow of electricity or network stability. These birds are highly territorial and some have been using the same nests for many years, i.e. Martial Eagle. They are guarded jealously by the landowners and are monitored by many groups involved with ensuring their continued existence, including Nature Conservation officials at National and Provincial level. It is therefore imperative that the breeding sites of these birds are kept intact and that the breeding pairs are not disturbed especially where there are young nestlings.</i> The Contractor shall take all the necessary precautions and it is recommended that sites on parallel existing lines be noted, i.e. tower numbers. This information must then be given to the avian specialist via the Environmental Advisor so that the necessary action can be taken timeously.	When necessary	When necessary	PM	C SHEQO	SHEQO ECO	EM PM
2	Fencing	Ensure that suitable fencing is erected prior to the commencement of construction to ensure that livestock does not wonder into dangerous areas.	Throughout the project	Weekly inspections.	PM	C SHEQO	SHEQO ECO	EM PM
<b>Construction Phase</b>								
1	Construction	The Contractor's workforce will have to be very careful not to disturb the animals as this may lead to fatalities which will give rise to claims from the Landowners.	Throughout the project	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		The Contractor shall under no circumstances interfere with livestock without the Landowner being present. This includes the moving of livestock where they interfere with construction activities.	Throughout the project	Throughout	PM	C SHEQO	SHEQO ECO	EM PM

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
		Should the Contractors workforce obtain any livestock for eating purposes, they must be in possession of a written note from the Landowner.	Throughout the project	When necessary	PM	C SHEQO	SHEQO ECO	EM PM
		Should any new sites or nests be found, during the construction process, that was not known or have been noted before, each site shall be assessed for merit and the necessary precautions be taken to ensure the least disturbance.	Throughout the project	When necessary	PM	C SHEQO	SHEQO ECO	EM PM
<b>Rehabilitation Phase</b>								
1	Construction	Same as construction phase.						
<b>Operational Phase</b>								
1	Construction	Same as construction phase.						

## 8.17 INTERACTION WITH LANDOWNERS

**Table 8-17: Environmental Management Measures for Interaction with Adjacent Land Owners**

Objectives	<ul style="list-style-type: none"><li>• Maintain good relations with Landowners;</li><li>• No delays in the project due to Landowner interference; and</li><li>• Landowner signs final release form.</li></ul>							
------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	--	--	--	--	--

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Interaction with Land Owners	All negotiations for any reason shall be between Eskom, the landowners and the Contractor.	When necessary	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		No verbal agreements shall be made. All agreements shall be recorded properly and all parties shall co-sign the documentation. It is proposed that a photographic record of access roads be kept.	Throughout the project	When necessary	PM	C SHEQO	SHEQO ECO	EM PM
		It is required that the Contractor will supply one person to be the liaison officer (CECO) for the entire contract, and that this person shall be available to investigate all problems arising on the work sites concerning adjacent landowners (TRMSCAAC1 REV 3).	Throughout project	Ongoing.	PM	C SHEQO	SHEQO ECO	EM PM
Construction Phase								
1	Interaction with Land Owners	The construction process will use the services of the Eskom CSP Environmental Monitoring / Management Committee (EMC) for communication with the land owners.	Throughout the project	Monthly	PM	PM	EM ECO	C SHEQO
		Any claims instituted by the Landowners shall be investigated and treated promptly. Unnecessary delays should be avoided at all costs.	Throughout the project	When necessary	PM	PM	EM ECO	C SHEQO
		Landowners shall always be kept informed about any changes to the construction programme should they be involved. If Eskom's Environmental Control Officer is not on site the Contractor's Environmental Control Officer should keep the Landowners informed.	Throughout the project	Monthly	PM	C SHEQO	SHEQO ECO	EM PM
		The contact numbers of the Contractor's ECO officer and the Eskom ECO shall be made available to the Landowners.	Throughout the project	Once-off	PM	C SHEQO	SHEQO ECO	EM PM
		All contact with the Landowners shall be courteous at all times.	Throughout the project	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		The rights of the Landowners shall be respected at all times and all staff shall be sensitised to the effect that we are working on private property.	Throughout the project	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
Rehabilitation Phase								

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
1	Interaction with Land Owners	Same as for construction phase above.						
<b>Operational Phase</b>								
1	Interaction with Land Owners	The rights of the Landowners shall be respected at all times and all staff shall be sensitised to the effect that we are working on private property.	Throughout the project	Throughout	PM	PM	EM ECO	C SHEQO

## 8.18 NOISE / WORKING HOURS

**Table 8-18: Environmental Management Measures for Noise Management.**

<b>Objective</b>	<ul style="list-style-type: none"> <li>To ensure that noise is managed in such a manner that no complaints are received.</li> </ul>
------------------	-------------------------------------------------------------------------------------------------------------------------------------

No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
Pre-Construction Phase								
None								
Construction Phase								
1	Noise	In order to prevent noise impacts resulting from construction activities, working hours are to be limited to weekdays between 7h00 to 17h00.	Throughout the project	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		If certain construction requires work outside of these hours, all adjacent landowners have to be informed prior to any construction outside of the specified hours commencing.	When necessary	Once – off, if necessary	PM	C SHEQO	SHEQO ECO	EM PM
		If there are complaints about low frequency noise after the refurbishment, Eskom would have to get a noise expert to do measurements and recommend mitigation.	When necessary	If necessary	PM	C SHEQO	SHEQO ECO	EM PM
Rehabilitation Phase								
1	Noise	Same as Construction Phase.						
Operational Phase								
1	Noise	Same as Construction Phase						

## 8.19 INFRASTRUCTURE PLANNING AND MANAGEMENT

**Table 8-19: Environmental Management Measures for Infrastructure.**

Objectives	<ul style="list-style-type: none"><li>• Ensure that existing infrastructure is taken into account during planning and project execution to eliminate impacts to existing infrastructure; and</li><li>• To avoid claims and litigation.</li></ul>							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Planning	Demarcate all existing infrastructure on site layout plans. Document condition of existing infrastructure prior to construction.	One day	Monthly Inspections	PM	C SHEQO	SHEQO ECO	EM PM
Construction Phase								
1	Construction activities	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.	Throughout Project	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
		Speed limits shall be enforced in such areas and all drivers shall be sensitised to this effect.	Throughout Project	Throughout	PM	C SHEQO	SHEQO ECO	EM PM
Rehabilitation Phase								
1	Re-instate all roads and infrastructure	Upon completion of the project all roads and infrastructure shall be repaired to their original state.	Post construction	Once-off	PM	C SHEQO	SHEQO ECO	EM PM
Operational Phase								
1	Re-instate all roads and infrastructure	Same as rehabilitation phase.						

## 8.20 HERITAGE RESOURCES

**Table 8-20: Environmental Management Measures for Heritage Resources.**

Objective	<ul style="list-style-type: none"><li>Protection of archaeological sites and land considered to be of cultural value;</li><li>Protection of known sites against vandalism, destruction and theft; and</li><li>The preservation and appropriate management of new archaeological finds should these be discovered during construction.</li></ul>								
No.	Activity	Mitigation Measures	Duration	Frequency	Responsible	Accountable	Contacted	Informed	
Pre-Construction Phase									
1	Planning	Ensure all known sites of cultural, archaeological, and historical significance are demarcated on the site layout plan, and marked as no-go areas.	Throughout Project	Weekly Inspection	PM	C SHEQO	SHEQO ECO	EM PM	
Construction Phase									
1	Emergency Response	Should any heritage resources be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped.	When necessary	Throughout	PM	C SHEQO	SHEQO ECO	EM PM	
		Should any heritage resources be exposed during excavation or be found on site, a registered heritage specialist must be called to site for inspection.	When necessary	Throughout	PM	C SHEQO	SHEQO ECO	EM PM	
		Should any heritage resources be exposed during excavation or be found on site, the relevant heritage resource agency must be informed about the finding;	When necessary	Throughout	PM	C SHEQO	SHEQO ECO	EM PM	
		Under no circumstances may any heritage material be destroyed or removed from site;	Throughout Project	Throughout	PM	C SHEQO	SHEQO ECO	EM PM	
		Should remains and/or artefacts be discovered on the site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Construction Manager.	Throughout Project	When necessary	PM	C SHEQO	SHEQO ECO	EM PM	
		Should any remains be found on site that is potentially human remains, the South African Police Service should also be contacted.	Throughout Project	When necessary	PM	C SHEQO	SHEQO ECO	EM PM	
Rehabilitation Phase									
		Same as construction phase.							
Operational Phase									
		Same as construction phase.							

## 8.21 RESIDENTIAL PROPERTY

**Table 8-21: Environmental Management Measures for Management of residential property**

Objectives	<ul style="list-style-type: none"><li>Control actions and activities in close proximity to inhabited areas;</li><li>No complaints from Landowners;</li><li>No damage to private property.</li></ul>							

No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Planning	All private residences will be demarcated on a site layout plan prior to construction phase commencing.	One day	Weekly Inspections	PM	C SHEQO	SHEQO ECO	EM PM
Construction Phase								
1	Construction execution	The Contractor shall under no circumstances interfere with the property of adjacent landowners.	Throughout project	Weekly Inspections	PM	C SHEQO	SHEQO ECO	EM PM
		If water is required, the Contractor shall negotiate with the relevant Landowner and a written agreement shall be drawn up (TRMSCAAC1 REV 3 section 4.8).	Throughout Project	Weekly Inspections	PM	C SHEQO	SHEQO ECO	EM PM
Rehabilitation Phase								
1	Rehabilitation execution	Same as construction phase.						
Operational Phase								
1	Maintenance of the power line	Same as construction phase.						



## **8.22 GENERAL REQUIREMENTS DURING CONSTRUCTION**

- Proper and continuous liaison between Eskom, the contractor and Landowners to ensure everyone is informed at all times.
- A physical access plan shall be compiled and the contractor shall adhere to this plan at all times. Proper planning when the physical access plan is drawn up by the Environmental Control Officer in conjunction with the Contractor shall be necessary to ensure access to all construction areas within the route corridor parameter.
- The adjacent landowners shall be informed of the starting date of construction as well as the phases in which the construction shall take place.
- The Contractor must adhere to all conditions of contract, including the Environmental Management Programme.
- Proper planning of the construction process to allow for disruptions due to rain and very wet conditions.
- Where existing private roads are in a bad state of repair, such roads' condition shall be documented before they are used for construction purposes. If necessary, some repairs should be done to prevent damage to equipment and plant.
- All manmade structures shall be protected against damage at all times and any damage shall be rectified immediately.
- Proper site management and regular monitoring of site works.
- Proper documentation and record keeping of all complaints and actions taken.
- Regular site inspections and good control over the construction process throughout the construction period.
- Appointment of an Environmental Control Officer on behalf of the Contractor to implement this EMP as well as deal with all Landowner related matters.
- Environmental Audits to be carried out during and upon completion of construction (at least three for the project).
- The Contractor shall not be released from site until all Landowners have signed off the release documentation to the satisfaction of the Eskom Environmental Control Officer.

## **8.23 SCHEDULING OF MANAGEMENT MEASURES**

The majority of the management measures are incident and control based. Therefore they will not occur in a management schedule but will rather occur in day to day operations. Where such measures occur these will be inspected during the audit activities provided for in the schedule.

### 8.23.1 SITE DOCUMENTATION / MONITORING / REPORTING

The standard Eskom site documentation shall be used to keep records on site, in addition all non-compliances to the environmental authorisation will be reported to the Director: Environmental Impact Evaluation within 48 hours. All documents shall be kept on site and be available for monitoring and auditing purposes. Site inspections by an Environmental Audit Team may require access to this documentation for auditing purposes. The documentation shall be signed by all parties to ensure that such documents are legitimate. Regular monitoring of all site works by the Environmental Control Officer is imperative to ensure that all problems encountered are solved punctually and amicably. When the Environmental Control Officer is not available, the Contract Manager/Site Supervisor shall keep abreast of all works to ensure no problems arise. The following checklist shall be used as an environmental performance monitoring tool.

**Table 8-22: Checklist for monitoring environmental performance on site.**

Person responsible for this line construction is:	
Name:	
Designation:	
Reporting of environmental performance, problems and priorities are as follows:	
Environmental monitoring of the construction is according to the following schedule:	
The following negative environmental impacts have been identified at the site:	
Environmental Problem	Location



- Emergency procedures are in place and effectively communicated to personnel.

The audit programme shall consist of the following at a minimum:

- First audit no later than 1 month after construction commences;
- Thereafter audits at monthly intervals, at a minimum;
- An audit one week prior to practical completion of the project is granted; and
- A post construction audit within 1 week after the contractor has moved off site.

#### **8.24.2 Compliance with the EMPr**

The Contractor and/or his agents are deemed not to have complied with the EMPr and remedial action if:

- There is evidence of contravention of the EMP clauses within the boundaries of the site or extensions.
- Environmental damage ensues due to negligence.
- The Contractor fails to comply with corrective or other instructions issued by the PM, within a time period specified by the PM.

---

**9      EMERGENCY NUMBERS**

---

- Police: 10111
- Ambulance 10177
- Netcare 911 082 911
- ER24 084 124
- Emergency 107
- Crimestop 08600 10 111

**ZITHOLELE CONSULTING (PTY) LTD**

Mathys Vosloo  
**Project Manager**

Sharon Meyer-Douglas  
**Project Associate**

Z:\PROJECTS\15042 - SOLAR PARK WULA\4 REPORTS\46 ENVIRONMENTAL\SITE SPECIFIC EMPR\15042-46-REP-002-EMPR SOLAR TO NIEUWEHOOP-REV0 DRAFT1.DOCX

## **APPENDIX A**

## **APPENDIX B**

## **APPENDIX C**



## APPENDIX 1: METHOD STATEMENTS

To be prepared by the contractor prior to commencement of the activity. The method statements are **not required** to be submitted to the CA.

## CURRICULUM VITAE: LLOYD MALATJI

### PERSONAL DETAILS

<b>Name and Surname</b>	Lloyd Malatji
<b>Proposed Project role:</b>	Environmental Scientist
<b>Contact Number:</b>	0658043521
<b>Email:</b>	Lloydmalatji@gmail.com
<b>Nationality:</b>	South African
<b>Home Language:</b>	Tsonga
<b>Other Languages:</b>	English, Sepedi, IsiZulu
<b>Driver's License:</b>	Code C1
<b>Years of Experience</b>	4 Years

### QUALIFICATIONS

<b>Name of Institution</b>	<b>Degree Obtained</b>
Tshwane University of Technology	Advanced Diploma in Environmental Sciences
Tshwane University of Technology	National Diploma in Environmental Science

### OTHER CERTIFICATION

SACNASP REGISTERED AS CANDIDATE NATURAL SCIENTIST
Introductory Course in Marine Protected Area Management from Nelson Mandela University
Certified ISO 45001:2018 Safety Management System Lead Implementer Professional

### PROFESSIONAL REGISTRATION AND MEMBERSHIPS

<b>Professional body</b>	<b>Level of registration</b>	<b>Registration No.</b>
SA Council of Natural Scientific Professions (SACNASP)	Candidate Natural Scientist	161345
Environmental Assessment Practitioners Association of South Africa (EAPASA)	Registered EAP	2023/6885

## EMPLOYMENT HISTORY

<b>1. Name of Company</b>	Green Gold Group (Pty) Ltd
<b>Position</b>	Environmental Scientist
<b>Duration</b>	June 2024 – Current
<b>Responsibilities</b>	<ul style="list-style-type: none"><li>• Planning and execution of project-related work, ensuring responsible and efficient allocation and use of resources.</li><li>• Engagement with clients to ensure that their needs are known and met Offer support to management and other team members, attend meetings as required.</li><li>• Execute all roles associated with environmental applications and audits.</li><li>• Looking for tender opportunities Relationship-building- Acquiring new clients- Registration in potential customer's databases. Social media marketing.</li><li>• Ensure company SHE documents are up to date.</li><li>• Supervision of junior staff members, making sure that they deliver their tasks on time.</li><li>• Quality check and approval of reports produced by Junior Staff.</li><li>• Approval of weekly plans and timesheets for Junior Staff.</li><li>• Managing workload of Junior Staff</li><li>• Training of Interns as in when required.</li><li>• Planning and execution of project-related work.</li><li>• Ensuring responsible and efficient allocation and use of resources</li><li>• Continuous engagement with clients to ensure that their needs are known and met.</li></ul>

<b>2. Name of Company</b>	JM Enviro Consultants
<b>Position</b>	Environmental Practitioner
<b>Duration</b>	May 2022-May 2024
<b>Responsibilities</b>	<ul style="list-style-type: none"><li>• Manage EIA projects, including the preparation and submission of Water Use License applicants</li></ul>

	<ul style="list-style-type: none"> <li>• Navigate the EIA, WULA, and WML process, ensuring compliance with regulatory requirements</li> <li>• Conduct compliance audits to assess adherence to environmental standards and regulations</li> <li>• Prepare Environmental Management Programmed to minimize the environmental footprint of projects and ensure sustainable outcomes</li> <li>• Conduct scoping and prepare EIA reports</li> <li>• Manage Water Use License applications ensuring compliance with water resource regulations and sustainable water management practices</li> <li>• Coordinate and facilitate public participation process</li> <li>• Prepare public participation reports</li> <li>• Prepare environmental screening reports</li> <li>• Prepare EIA proposals and quotations, detailing the scope of work, methodology, and resource requirements for environmental assessments</li> </ul>
<b>Relevant projects completed</b>	<p>Upgrade of dams, weapon handling area, pump station, and construction of the above ground reservoir on portion 68 of the farm Roodeplaat 293 JR at Roodeplaat Dog School, City of Tshwane Metropolitan Municipality.</p> <p>Phase 2 upgrade of Trotsville primary school buildings located in Trotsville ect. 13, Maquassi Hills Local Municipality within Dr Kenneth Kaunda District Municipality, North West province</p> <p>Construction of Rysmierbult Mega farm School in ward 28, portion 3 and 4 IQ, and the remainder of Rysmierbult 88IQ within the jurisdiction of the JB Marks Local Municipality.</p> <p>Upgrade of Soweto P2241/1 main road, beginning at the intersection with road D524/K15 south of Protea Glen mall and ending at Road P45/1/K11 in Gauteng province</p>
<b>3. Name of Company</b>	Department of Forestry, Fisheries and Environment
<b>Position</b>	Environmental Officer
<b>Duration</b>	01 September-March 2022

<b>Responsibilities</b>	<ul style="list-style-type: none"> <li>Regulate and manage the marine ecosystem, protected species and protected areas to ensure conservation and sustainable use of marine resources</li> <li>Promote compliance with the environmental legislation</li> </ul>
	<ul style="list-style-type: none"> <li>Permitted and managed marine species tourism to ensure sustainable tourism practices, minimize impacts on marine species and habitats</li> <li>Conduct site visits and compliance monitoring to assess the impact of TOPS permitted activities on threatened or protected species and ensure compliance with environmental regulations</li> <li>Collaborate with stakeholders, including tourism operators, researchers, to promote sustainable management of marine resources and achieve conservation goals</li> <li>Maintain up to date knowledge of marine conservation best practices, regulations and trends to inform decision making and ensure effective management of protected species</li> </ul>

<b>4. Name of Company</b>	Enkanyini Consultants
<b>Position</b>	Junior Environmental Practitioner
<b>Duration</b>	January 2020- July 2021
<b>Responsibilities</b>	<ul style="list-style-type: none"> <li>Compiling Basic Assessment Reports</li> <li>Administrative duties</li> <li>Conducting Environmental Audits and compiling monthly audit reports</li> <li>Undertaking of Environmental Audits</li> <li>Completing Water Use License Applications</li> <li>Public Participation Process coordination and facilitation (Conducting public meetings, compiling I&amp;AP database, communicating with I&amp;APs)</li> <li>Liaison with clients, authorities and stakeholders</li> <li>Co-ordination and facilitation of the public participation process</li> <li>Compilation of Environmental Impact Assessments (EIA's), Basic Assessment Reports and Environmental Management Plans (EMPs) etc.</li> </ul>
<b>Relevant projects completed</b>	Construction of 1km road in Hebron within Madibeng Local Municipality in North West Province

	Upgrading of bulb pipeline and refurbishment of Van Heerden reservoir in Goven Mbeki municipality in Mpumalanga Province
	Rehabilitation of 6.74 km of Road D2940 from Phiva to Mdladla in Ehlanzeni region of Mpumalanga Province within the Jurisdiction of the Nkomazi Local Municipality
	Rehabilitation of 8.94 km of road P26/5 between Breyten and Carolina in Msukaligwa Local Municipality in Gert Sibande region of Mpumalanga Province.
	Upgrade of SAPS intervention unit on portion 145 of the farm Onderstepoort 300 JR in Gauteng Province.



**Environmental Assessment  
Practitioners Association  
of South Africa**



Registration No. 2023/6585

***Herewith certifies that***

**Lloyd Malatji**

***is registered as an***

**Environmental Assessment Practitioner**

***Registered in accordance with the prescribed criteria of Regulation 15. (1)  
of the Section 24H Registration Authority Regulations  
(Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the  
National Environmental Management Act (NEMA), Act No. 107 of 1998, as  
amended).***

Effective: 01 March 2024

Expires: 28 February 2025

Chairperson

Registrar







**herewith certifies that**

**Lloyd Malatji**

Registration Number: 161345

**is a registered scientist**

in terms of section 20(3) of the Natural Scientific Professions Act, 2003  
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Candidate Natural Scientist)

Effective    **18 January 2024**

Expires      **31 March 2025**



A handwritten signature in black ink, appearing to be 'S. Neph', is written over a horizontal line.

Chairperson

A handwritten signature in black ink, appearing to be 'N. Maseko', is written over a horizontal line.

Chief Executive Officer

