

**CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME
APPENDIX TO THE APPROVED ENVIRONMENTAL MANAGEMENT
PROGRAMME (DFFE REF: 14/12/16/3/3/2/977)**

**PROPOSED DEVELOPMENT OF THE KUDU POWER STATION (PS)–
ORANJEMOND 400KV LINE, NORTHERN CAPE PROVINCES
(DFFE REF: 14/12/16/3/3/2/977)**

Prepared for:



Eskom Holdings SOC Ltd

Prepared by:



ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

CES

67 African Street, Grahamstown, 6139

Grahamstown

Also in Cape Town, Port Elizabeth, East London, Johannesburg and Maputo
(Mozambique)

www.cesnet.co.za

SEPTEMBER 2022



REVISIONS TRACKING TABLE

CES Report Revision and Tracking Schedule

Document Title:	Proposed Development of the Kudu Power Station (PS)–Oranjemond 400KV Line, within the Northern Cape Provinces	
Client Name & Address:	Eskom Holdings Soc Ltd Megawatt Park, Johannesburg P O BOX 1091 Johannesburg 2000	
Status:	Final	
Issue Date:	September 2022	
Lead Author:	Mr Alain du Plessis	
Reviewer:	Mr Gregory Shaw	
Study Leader/ Registered Environmental Assessment Practitioner – Approval:	Dr Alan Carter	

This document has been prepared in accordance with the scope of CES's appointment and contains intellectual property and proprietary information that is protected by copyright in favour of CES. The document may therefore not be reproduced, used or distributed to any third party without the prior written consent of CES. This document is prepared exclusively for use by CES's client. CES accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of CES. The document is subject to all confidentiality, copyright and trade secrets rules, intellectual property law and practices of South Africa.



Info@cesnet.co.za
www.cesnet.co.za



LIST OF ACRONYMS

AIS	Alien Invasive Species
BID	Background Information Document
BAR	Basic Assessment Report
CA	Competent Authority
CBA	Critical Biodiversity Area
CES	Coastal and Environmental Services (Pty) Ltd. (t/a CES)
DEDECT	Department of Economic Development, Environment, Conservation and Tourism
DFFE	Department of Forestry, Fisheries and the Environment
DENC	Department of Environment and Nature Conservation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GN	Government Notice
IDP	Integrated Development Plan
I&AP	Interested and Affected Party
MEC	Member of the Executive Council
NEMA	National Environmental Management Act
NEMBA	National Environmental Management Biodiversity Act
NFEPA	National Freshwater Ecosystem Priority Area
NDP	National Development Plan
OHL	Overhead Line
PPP	Public Participation Process
SACNASP	South African Council for Natural Scientific Professions
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SCC	Species of Conservation Concern
SG	Surveyor General



TABLE OF CONTENTS

1	<u>INTRODUCTION</u>	<u>1</u>
1.1	CONSTRUCTION EMPR.....	2
2	<u>CONTENTS OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR).....</u>	<u>1</u>
3	<u>BACKGROUND INFORMATION</u>	<u>1</u>
3.1	PROJECT DESCRIPTION	1
3.2	ENVIRONMENTAL OBJECTIVES AND TARGETS	2
3.3	NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)	3
3.4	DETAILS OF EAP.....	9
4	<u>IMPACT ASSESSMENT AND MITIGATION SUMMARY</u>	<u>1</u>
4.1	SUMMARY OF IMPACTS ASSOCIATED WITH THE DEVELOPMENT	2
4.2	SUMMARY OF MITIGATION MEASURES	3
5	<u>ENVIRONMENTAL MANAGEMENT SYSTEM</u>	<u>10</u>
5.1	REPORTING	10
5.1.1	<i>Administration</i>	<i>10</i>
5.1.2	<i>Record Keeping</i>	<i>10</i>
5.1.3	<i>Document Control</i>	<i>11</i>
5.2	PLANNING AND DESIGN, PRE-CONSTRUCTION AND CONSTRUCTION PHASE	11
5.2.1	<i>Environmental Training and Awareness</i>	<i>11</i>
5.2.2	<i>EMPr training and awareness before commencement of construction.....</i>	<i>12</i>
5.2.3	<i>EMPr awareness training throughout the construction phase</i>	<i>12</i>
5.2.4	<i>Construction Site</i>	<i>13</i>
5.2.5	<i>On-site Communication Procedure</i>	<i>13</i>
5.2.6	<i>Design.....</i>	<i>14</i>
5.2.7	<i>Servitude Agreements and Site Requirements</i>	<i>15</i>
5.2.8	<i>Waste Management</i>	<i>16</i>
5.2.9	<i>Ground and Surface Water</i>	<i>17</i>
5.2.10	<i>Rivers and Streams.....</i>	<i>18</i>
5.2.11	<i>Freshwater Resources</i>	<i>19</i>
5.2.12	<i>Dust Control</i>	<i>19</i>
5.2.13	<i>Fire Management.....</i>	<i>19</i>
5.2.14	<i>Emergency Management.....</i>	<i>20</i>



5.2.15	<i>Protection of Natural Features</i>	21
5.2.16	<i>Protection of Flora and Fauna</i>	21
5.2.17	<i>Avifauna</i>	22
5.2.18	<i>Protection of Heritage Features</i>	22
5.2.19	<i>Preparation of Servitude / Vegetation Clearance</i>	22
5.2.20	<i>Control of Alien Vegetation</i>	24
5.2.21	<i>Revegetation</i>	24
5.2.22	<i>Visual Impact</i>	25
5.2.23	<i>Soil Erosion</i>	25
5.2.24	<i>Community Issues (Safety, Security, Noise, Dust, Etc.)</i>	26
5.2.25	<i>Agricultural Activities</i>	26
5.2.26	<i>Cultural-Historical Component</i>	27
6	<u>ENVIRONMENTAL MANAGEMENT PROTOCOL</u>	28
6.1	ROLES AND RESPONSIBILITIES	28
6.1.1	<i>Applicant/Developer</i>	28
6.1.2	<i>Project Co-ordinator (PC)</i>	28
6.1.3	<i>Construction Supervisor and the Contractor (if utilised)</i>	28
6.1.4	<i>Environmental Control Officer (ECO)</i>	29
6.2	COMPLIANCE MONITORING AND CORRECTIVE ACTION	29
6.3	ADDITIONAL MITIGATION MEASURES	32
6.3.1	<i>Pre-Construction</i>	32
6.3.2	<i>Construction Phase</i>	32
6.4	MONITORING	33
7	<u>ENVIRONMENTAL AWARENESS</u>	34
8	<u>CONCLUSION</u>	36
9	<u>ANNEXURE 1: METHOD STATEMENTS</u>	37
10	<u>ANNEXURE 2: BASIC ENVIRONMENTAL EDUCATION COURSE OUTLINE</u>	40
11	<u>ANNEXURE 3: DETAILS AND CVS OF THE PROJECT TEAM</u>	43
12	<u>ANNEXURE 4: SITE SENSITIVITY MAP</u>	61



LIST OF TABLES

Table 2.1: Contents of an EMPr 1

Table 3.1: Relevant legislation applicable to the project 3

Table 4.1: Summary of impacts and their post mitigation significance..... 2

Table 4.2: Mitigation measures associated with each impact during design, planning and construction phase .. 3

Table 4.3: Summary of mitigation measures associated with the operational phase..... 8

Table 4.4: Summary of the mitigation measures applicable to the decommissioning phase 9

LIST OF FIGURES

Table 2.1: Contents of an EMPr 1

Table 3.1: Relevant legislation applicable to the project 3

Table 4.1: Summary of impacts and their post mitigation significance..... 2

Table 4.2: Mitigation measures associated with each impact during design, planning and construction phase .. 3

Table 4.3: Summary of mitigation measures associated with the operational phase..... 8

Table 4.4: Summary of the mitigation measures applicable to the decommissioning phase 9



1 INTRODUCTION

An Environmental Management Programme (EMPr) must consist of a set of mitigation, monitoring and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The plan also includes the actions needed to implement these measures.

An EMPr can be defined as, *“an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the project are enhanced”*. The EMPr is an important tool used to ensure the sound environmental management of projects, provided the specifications are implemented and the user understands the contents of the report and the reasons for the implementation of certain specifications.

The EMPr has the following objectives:

- To state standards and guidelines which are required to be achieved in terms of environmental legislation;
- To set out the mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts and where possible to improve the condition of the environment;
- To provide guidance regarding method statements which are required to be implemented to achieve the environmental specifications;
- To define corrective actions, this must be taken in the event of non-compliance with the specifications; and
- To prevent long-term or permanent environmental degradation.

There are four broad categories of EMPrs: Design EMPr, Construction EMPr, Operational EMPr and Decommissioning EMPr. The objectives of these EMPrs are all the same and include identifying the possible environmental impacts of the proposed activity and developing measures to minimise, mitigate and manage the negative impacts while enhancing the positive ones. The difference between these EMPrs is related to the different mitigation measures required for the different stages of the project life cycle.

This EMPr focuses solely on the Construction Phase of the proposed 400kV Line and is discussed below.

PLEASE NOTE THAT THE EMPr HAS BEEN AMENDED TO INCLUDE THE LINE ROUTE VARIATION. ALL CHANGES TO THE EMPr HAVE BEEN WRITTEN IN BOLD AND RED FOR EASE OF REFERENCE.



1.1 CONSTRUCTION EMPR

The Construction EMPr details the environmental management system/framework within which construction activities will be governed for the Construction Phase. The Construction EMPr consists of various actions, initiatives and systems (such as a Standard Operating Procedure – SOP, or a Method Statement) that the contractor will have to ensure are in place and are implemented and complied with. The Construction EMPr consists of both a management system (in so far as it explains responsibilities and lines of reporting), and environmental specifications which contain detailed specifications related to achieving specific mitigation measures that will need to be undertaken or adhered to by the contractor.

The Construction EMPr must be developed in parallel with the final design stages, and constructive input must be invited from the selected contractor. This is required not to soften the document, but rather to ensure that the requirements in the Construction EMPr are practical, cost effective and implementable. Sound environmental management is orientated around pragmatic, unambiguous but enforceable guidelines and specifications, and for this reason it is imperative that the contractor, while being bound by the EMPr, fully understands it and has had input into its final development. For this reason the final construction EMPr will need to be signed off prior to the initiation of construction activities. The contractor must tender on the existing document and that in areas of uncertainty, a precautionary approach to the environmental guidelines and specifications must be adopted (by, for example, providing Prime Cost and Provisional Sum amounts).



2 CONTENTS OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

The contents of the *Environmental Management Programme (EMPr)*, as defined the 2014 Environmental Impact Assessment (EIA) Regulations published as Government Notice (GN) No R. 982 (amended in 2021 in GN R 326) and Chapter 5 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) is presented in Table 1 below.

Table 2.1: Contents of an EMPr

EMPr REQUIREMENTS ACCORDING TO APPENDIX 4 OF THE 2014 EIA REGULATIONS (AS AMENDED IN APRIL 2017)	SECTION OF REPORT
<i>An EMPr must comply with section 24N of the Act and include-</i>	
<i>a. Details of:</i>	Section 3.5 and Annexure 3
<i>i. the EAP who prepared the EMPr; and</i>	
<i>ii. the expertise of that EAP to prepare an EMPr, including a curriculum vitae.</i>	Annexure 3
<i>b. a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;</i>	Chapter 3
<i>c. a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;</i>	Annexure 4
<i>d. a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-</i>	Chapter 4
<i>i. Planning and design</i>	
<i>ii. Pre-construction activities</i>	
<i>iii. Construction activities</i>	
<i>iv. rehabilitation of the environment after construction and where applicable post closure; and</i>	
<i>v. where relevant, operation activities;</i>	
<i>f. description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to -</i>	Section 3.2 – Section 3.4 and Chapter 5
<i>a. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;</i>	
<i>b. comply with any prescribed environmental management standards or practices;</i>	
<i>c. comply with any applicable provisions of the Act regarding closure, where applicable; and</i>	
<i>d. comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;</i>	
<i>g. the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);</i>	Chapter 5 and Chapter 6
<i>h. the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);</i>	Chapter 6
<i>i. an indication of the persons who will be responsible for the implementation of the impact management actions;</i>	
<i>j. the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;</i>	
<i>k. the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);</i>	
<i>l. a program for reporting on compliance, taking into account the requirements as prescribed</i>	



EMPr REQUIREMENTS ACCORDING TO APPENDIX 4 OF THE 2014 EIA REGULATIONS (AS AMENDED IN APRIL 2017)	SECTION OF REPORT
<i>by the Regulations;</i>	
<i>m. an environmental awareness plan describing the manner in which-</i> <i>a. the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</i> <i>b. risks must be dealt with in order to avoid pollution or the degradation of the environment; and</i>	Section 5.2.17
<i>n. any specific information that may be required by the competent authority.</i>	Nothing specified at this stage



3 BACKGROUND INFORMATION

3.1 PROJECT DESCRIPTION

Kudu Power Station is located about 40km north of Oranjemond Main Transmission Substation (MTS), in Namibia. This power station will provide power to both the NamPower and Eskom networks. The Oranjemond MTS is approximately 20km east of Alexander Bay, directly south of the Orange River in the Northern Cape Province. (see Figure 3.1)



Figure 3.1: Alignment of the towers on the southern bank of the Orange River



In 2017 there two 400 kV lines designed to exit Oranjemond substation crossing the Orange River and into Namibia. The line lengths were approximately 2 km each. Due to the environmental sensitivity of the area the Environmental Authorisation for the project was done with the specific tower positions from the conceptual design. The original design was done using the 518 series structures. In addition to this, there were three structures per line inside the highly sensitive Orange River zone. This was approved as a conceptual line profile.

The new design came about after a scope change in the then Kudu project where only a single 400 kV line was required. The design was re-evaluated and changed to make use of the newly developed 540 series structures to cross the river. The successful prototyping and implementation of the structure has provided confidence in a solution that was not available when the concept design was done for this project. Due to the larger wind span and electrical span of this structure the river could be crossed in a single span which is 975 m long. Even though the 540 series structure has a slightly larger footprint than the 518 series (17m compared to 12.5m), the total number of foundations are reduced from 20 to 8 for the towers crossing the river.

The 400 kV line was also placed further away from the existing 66 kV line ensuring there will be no flashover during blowout which correlates to a more reliable supply. The use of the 540 structure allows for a semi-delta configuration allowing for longer spans without blowout issues. It also allows for higher clearance over the river adhering to SANS 10280 requirements. This overall design improvement provides higher reliability of the line.

3.2 ENVIRONMENTAL OBJECTIVES AND TARGETS

The compilation of this Environmental Management Programme (EMPr) forms part of the requirements of the EIA Regulations 2014 (as Amended) and compliance with the contents of this report is required during the construction and operational phases of the project. The EMPr serves as an environmental management tool by providing a generic structured plan of mitigatory measures, which serves as a guide to assist in minimising the potential environmental impact of the activity that may arise during the construction phases.

The EMPr provides a set of guidelines for the environmental management of all works to be executed by the Engineer and Contractor, so as to avoid, or have a minimum impact on the environment in accordance with all relevant legislation, policies and standards.

In this context it should be viewed as a dynamic or 'living' document, which may require updating, or revision during the life-cycle of the project to address new circumstances as the need arises. It is essentially a written plan of how the environment is to be managed in practical and achievable terms.

The effectiveness of the EMPr is limited by the level of adherence to the conditions set forth in this report by the Developer and the Contractor. It is further assumed that compliance with the EMPr will be monitored on a regular basis as set out in the EMPr and contractual clauses.



The EMPr forms part of the Contract Documentation and is thus a legally binding document. An individual responsible for environmental damage must pay costs both to environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring (the Polluter Pays Principle).

Further to the above, the following objectives apply:

- To state the standards and guidelines which Eskom will be required to adhere to in terms of environmental legislation;
- To set out the mitigation measures and environmental specifications which Eskom will be required to implement for the construction phase of the project in order to minimise the extent of environmental impacts, and where possible to improve the condition of the environment;
- To provide guidance regarding the method statements which Eskom will be required to compile and implement to achieve the environmental specification;
- To define corrective actions which Eskom must take in the event of non-compliance with the specifications of this EMPr;
- To mitigate potential negative impact associated with the project and ensure optimising of positive impact;
- To prevent long-term or permanent environmental degradation;
- To ensure that the applicant, construction workers and the operational and maintenance staff are well acquainted with their responsibilities in terms of the environment;
- To ensure that communication channels to report on environment related issues are in place.

3.3 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

This application is done in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations published in Government Notice No. R.982, December 2014 (as amended). Environmental Authorisation is requested for the following listed activities:

Table 3.1: Relevant legislation applicable to the project

Title of legislation, policy or guideline	Applicability to the project	Project applicable
National Environmental Management Act, 1998 (Act No. 107 of 1998)	This application is done in terms of the National Environmental Management Act, 1998 (Act No	
	107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations published in Government Notice No. R.982, December 2014. Environmental Authorisation is requested for the following listed activities	
GN 983: Listing Notice 1, Activity 12:	The development of- <ul style="list-style-type: none"> i. canals exceeding 100 square metres in size; ii. channels exceeding 100 square metres in size; iii. bridges exceeding 100 square metres in size; iv. dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; v. weirs, where the weir, including infrastructure and water surface area, exceeds 100 square 	Two approximately 2km new power lines will be constructed and the footprint of the pylons will be 100m ² . Some of the pylon towers will be constructed within 32m from the Orange River.



Title of legislation, policy or guideline	Applicability to the project	Project applicable
	<p>metres in size;</p> <ul style="list-style-type: none"> vi. bulk storm water outlet structures exceeding 100 square metres in size; vii. marinas exceeding 100 square metres in size; viii. jetties exceeding 100 square metres in size; ix. slipways exceeding 100 square metres in size; x. buildings exceeding 100 square metres in size; xi. boardwalks exceeding 100 square metres in size; or xii. infrastructure or structures with a physical footprint of 100 square metres or more; xiii. where such development occurs- xiv. within a watercourse; xv. in front of a development setback; or xvi. if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; <p>where such development occurs-</p> <ul style="list-style-type: none"> a) within a watercourse; b) in front of a development setback; or c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; - <p>excluding-</p> <ul style="list-style-type: none"> (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; or (ee) where such development occurs within existing roads or road reserves. 	
GN 983: Listing Notice 1, Activity 19	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-</p> <ul style="list-style-type: none"> i. a watercourse; ii. the seashore; or iii. the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater <p>But excluding where such infilling, depositing, dredging,</p>	<p>Foundations of 136m² combined (therefore more than 5m³) will be constructed for the towers and some will occur within 32m of a watercourse (the Orange River).</p>



Title of legislation, policy or guideline	Applicability to the project	Project applicable
	excavation, removal or moving- <ul style="list-style-type: none"> a) will occur behind a development setback; b) is for maintenance purposes undertaken in accordance with a maintenance management plan; c) or falls within the ambit of activity 21 in this Notice, in which case that activity applies. 	
GN R 983: Listing Notice 1, Activity 24	The development of- <ul style="list-style-type: none"> (i) a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding- <ul style="list-style-type: none"> (a) roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or (b) roads where the entire road falls within an urban area. 	The existing R382 road will be deviated at the south-east corner of the substation extension
GN R 983: Listing Notice 1, Activity 27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- <ul style="list-style-type: none"> i. the undertaking of a linear activity; or ii. maintenance purposes undertaken in accordance with a maintenance management plan. 	The existing 2,5-hectare footprint of the substation site will be enlarged by an additional 4 hectares of land. The site contains indigenous vegetation.
GN R 983: Listing Notice 1, Activity 47	The expansion of facilities or infrastructure for the transmission and distribution of electricity where the extended capacity will exceed 275 kilovolts and the development footprint will increase.	The project components for the substation upgrade involve <ul style="list-style-type: none"> • The construction of a 400kV yard and equipment including busbar and bus coupler bay; • installing a 1x 315MVA 400/220kV transformer • creating at least 4x 400kV line bays to allow for potential development In order to achieve the above, it is required to increase the existing 2,5 hectare footprint of the substation with an additional 4 hectares is required. The final footprint will be 6,5ha.
GN R 984:	The development of facilities or infrastructure for the	Two approximately 2km



Title of legislation, policy or guideline	Applicability to the project	Project applicable
Listing Notice 2, Activity 9	transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.	400kV powerlines will be constructed. The expansion of the existing Oranjemond MTS Substation also forms part of the project components. The study area falls outside urban areas and industrial complexes
GN R 985: Listing Notice 3, Activity 4	<p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>a) In Free State, Limpopo, Mpumalanga and Northern Cape provinces:</p> <p>i. In an estuary;</p> <p>ii. Outside urban areas, in:</p> <p>aa) A protected area identified in terms of NEMPAA, excluding disturbed areas;</p> <p>bb) National Protected Area Expansion Strategy Focus areas;</p> <p>cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>dd) Sites or areas identified in terms of an International Convention;</p> <p>ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>ff) Core areas in biosphere reserves;</p> <p>gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas; or</p> <p>hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or</p> <p>iii. In urban areas</p> <p>(aa) Areas zoned for use as public open space</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or</p> <p>(cc) Seawards of the development setback line or within urban protected areas.</p>	<ul style="list-style-type: none"> • A new access road wider than 4m will be built to the existing Oranjemond Substation site. • The R382 could be deviated at the south east corner of the substation site. It is estimated to involve approximately 4 weeks during the construction phase, but it may not be required at all if the bypass could be accommodated from another turn-off from the main road. A temporary road will need to be graded next to the current road during the deviation upgrade. • The study area on the northern side of the Orange River is classified as an Ecological Support Area (ESA). • The section of the study area south of the Orange River is classified as a Critical Biodiversity Area (CBA) Type 2. • The study area is located approximately 10km upstream from the Orange River Mouth Wetlands Important Bird Area (IBA) (SA 030) This IBA



Title of legislation, policy or guideline	Applicability to the project	Project applicable
		<p>was declared a Ramsar site in 1991, as was the Namibian side of the mouth in 1995. Together they form the Orange River Mouth Transboundary Ramsar Site.</p>
<p>GN R 985: Listing Notice 3, Activity 12</p>	<p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance plan.</p> <p>(d) In Northern Cape</p> <ol style="list-style-type: none"> Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA 'or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004 Within critical biodiversity areas identified in bioregional plans Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning. 	<p>The existing 2,5 hectare footprint of the substation site will be enlarged by an additional 4 hectares of land. The site contains indigenous vegetation.</p> <p>The study area on the northern side of the Orange River is classified as an Ecological Support Area (ESA).</p> <p>The section of the study area on south of the Orange River is classified as a Critical Biodiversity Area (CBA) Type 2.</p>
<p>GN R 985: Listing Notice 3, Activity 14</p>	<p>The development of-</p> <ol style="list-style-type: none"> canals exceeding 10 square metres in size ; channels exceeding 10 square metres in size; bridges exceeding 10 square metres in size; dams, where the dam, including infrastructure and water surface area exceeds 10 square metres in size; weirs, where the weir, including infrastructure and water surface area exceeds 10 square metres in size; bulk storm water outlet structures exceeding 10m2 in size; marinas exceeding 10 square metres in size jetties exceeding 10 square metres in size; slipways exceeding 10 square metres in size; buildings exceeding 10 square metres in size; boardwalks exceeding 10 square metres in size; or infrastructure or structures with a physical footprint of 10 square metres or more; 	<p>Two approximately 2km new power lines will be constructed and the footprint of the pylons will be 100m² (will therefore exceed 10m²).</p> <p>Some towers will be constructed within 32m from a watercourse (the Orange River).</p> <p>The study area is located approximately 10km upstream from the Orange River Mouth Wetlands Important Bird Area (IBA) (SA 030) This IBA was declared a Ramsar site in 1991, as was the Namibian side of the mouth in 1995. Together they form the</p>



Title of legislation, policy or guideline	Applicability to the project	Project applicable
	<p>where such development occurs</p> <ul style="list-style-type: none"> (a) within a watercourse; (b) in front of a development setback or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <ul style="list-style-type: none"> (a) In Free State, Limpopo, Mpumalanga and Northern Cape: <ul style="list-style-type: none"> i. In an estuary; ii. Outside urban areas, in <ul style="list-style-type: none"> (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas identified in terms of an International Convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or iii. In urban areas <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or (cc) Areas seawards of the development setback line 	<p>Orange River Mouth Transboundary Ramsar Site.</p>



3.4 DETAILS OF EAP

The following undertaking must be filled out and signed by the applicant and forwarded to the Department of Forestry, Fisheries and the Environment prior to commencement of construction:

Environmental Assessment Practitioner (EAP): Dr Ted Avis

Company: Coastal and Environmental Services (CES)

Report Author: Mr Alain Du Plessis, Mr Gregory Shaw

Telephone: +27 21 045 0900

Website: www.cesnet.co.za

Email: cesct@cesnet.co.za

Please refer to Annexure 3 for the Curricula Vitae of the EAP and the project team.



4 IMPACT ASSESSMENT AND MITIGATION SUMMARY

Key impacts generally associated with Eskom construction activities which are applicable to this project are:

DIRECT (PRIMARY) IMPACTS

Planning Phase (Route selection and design of line and substation):

- Impact on natural habitat (terrestrial fauna & flora)
- Impact on avi-fauna
- Impact on the Orange River
- Cultural-heritage impact
- Visual impact
- Impact on landownership / land occupiers / land claims issue

Construction Phase:

- Impact on natural habitat (terrestrial fauna & flora)
- Disturbance to avi-fauna habitat
- Increased risk for surface and groundwater pollution
- Increased risk for erosion
- Archeological and paleontological resources
- Influx of labourers to the area with associated crime, access control, risk for habitat destruction
- Impacts associated with construction activities such as noise and dust

Cumulative Impacts:

- Visual Impact
- Reduced ability to meet conservation obligations & targets
- Impact on broad-scale ecological processes

Specifications and conditions are hereby provided to limit and/or prevent impact on these components during all the phases of project development, namely

- Specifications applicable throughout all Phases of Project Development
- Design & Pre-construction Phase
- Construction Phase



4.1 SUMMARY OF IMPACTS ASSOCIATED WITH THE DEVELOPMENT

The table below shows the significance of the impacts after mitigation is taken into account:

Table 4.1: Summary of impacts and their post mitigation significance

Impacts			Significance rating of impacts after mitigation (Low, Medium, Medium-High, High, Very High):
Planning, and design phases			
1.	Environmental policy	Legal and policy compliance	Low -
2.	Built environment	Infrastructure	Low -
3.		Stormwater management	Low -
4.		Waste management	Low -
5.	Socio-economic	Job creation	Low +
6.		Health and Safety	Low -
7.		On-site fire risk	Low -
8.		Traffic	Low -
9.	Rehabilitation and maintenance	Inadequate rehabilitation and maintenance	Low -
Construction phase			
1.	Environmental policy	Legal and policy compliance	Low -
2.	Built environment	Infrastructure	Low -
3.		Material stockpiling	Low -
4.		Stormwater management	Low -
5.		Waste management	Low -
6.	Socio-economic	Job creation	Low +
7.		Loss of agricultural job opportunities	Low -
8.		Health and safety	Low -
9.		Air quality and dust control	Low -
10.		On-site fire risk	Low -
11.	Rehabilitation and maintenance	Inadequate rehabilitation and maintenance	Low -
12.	Terrestrial biodiversity and ecology	Loss of Schmidtsdrift Thornveld	Low -
13.		Loss of Plant Species of Conservation Concern	Moderate -
14.		Impact on faunal species of conservation concern	Low -
15.		Reduced Faunal habitat	Low -
16.		Disruption of Faunal Species and Potential reduction in abundance and mortality of faunal species	Low -
17.		Disruption of ecosystem function and process	Low -
18.		Establishment of Alien Plant Species	Low -
19.	Visual impact	Visual impact of construction activity	Low -
20.	Heritage and cultural	Loss of archaeological feature	Low -



Impacts			Significance rating of impacts after mitigation (Low, Medium, Medium-High, High, Very High):
21.	resources	Loss of historically significant building and structures	Low -
22.		Alternation of cultural landscape	Low -
23.		Disturbance to graves/human burial sites	Low -

4.2 SUMMARY OF MITIGATION MEASURES

The information below provides site specific mitigation measures.

For towers 6 and 7, the following was recommended:

- Strict, daily monitoring by the ECO of Towers 6 and 7 during the construction phase to ensure that activities do not impact on these two populations of Species of Conservation Concern; and
- The implementation of the recommended mitigation measures.

It is recommended that the following conditions are included in the Environmental Authorisation (EA):

- All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities;
- The ECO must monitor construction activities at Towers 6 and 7 on a daily basis when these two towers are being constructed to ensure that no activities impact on the two populations of Species of conservation Concern;
- The population of Sensitive Species 542 must be demarcated as a no-go area. No construction activities must occur within this area; and
- All Schedule 1 and 2 species must be relocated to nearest appropriate habitat.

Table 4.2 covers best practice mitigations.

Table 4.2: Mitigation measures associated with each impact during design, planning and construction phase

THEME	POTENTIAL ISSUES	MITIGATION MEASURES
Environmental policy	Legal and policy compliance	<p><u>Design and planning phase:</u></p> <ul style="list-style-type: none"> All relevant legislation and policy must be consulted and the proponent must ensure that the project is compliant with such legislation and policy. These should include (but are not restricted to): NEMA and Local Municipal bylaws. All relevant permits and authorisations including Water Use Licenses or General Authorisations, Building Plan Approvals and plant removal permits must be in place prior to commencement of construction. <p><u>Construction phase:</u></p> <ul style="list-style-type: none"> All construction related conditions in the Environmental Authorisation, EMPr and other permits must be adhered to.



THEME	POTENTIAL ISSUES	MITIGATION MEASURES
		<ul style="list-style-type: none"> Eskom Holdings SOC must employ an independent Environmental Control Officer (ECO) for the construction phase to ensure that construction is implemented according to specifications in the EA and EMPr. Copies of all applicable licenses, permits and managements plans (EA, EMPr, etc.) must be available on-site at all times. Environmental Awareness Training must be included in site meetings/talks with all workers.
Built environment	Infrastructure	<p><u>Design and planning phase:</u></p> <ul style="list-style-type: none"> Planning for and placement of infrastructure must be done so as to avoid sensitive areas as far as possible. <p><u>Construction phase:</u></p> <ul style="list-style-type: none"> Vegetation clearance must be limited to the area within the footprint of the designated area. Vegetation disturbance outside of the development footprint should be minimized.
	Stormwater management	<p><u>Design and planning phase:</u></p> <ul style="list-style-type: none"> A method statement must be developed by the project manager or contractor prior to construction, including considerations for stormwater, erosion, waste and alien vegetation management, as well as site rehabilitation and maintenance considerations. This method statement must be approved by the appointed ECO. This method statement should include stormwater management considerations to control runoff prevent erosion of the site and its surroundings, and mitigate the unnecessary loss of soil and sedimentation of watercourses during all phases of the project. Regular monitoring of implementation of this method statement for the rehabilitation of disturbed areas must be conducted. Appropriate stormwater structures, in alignment with the method statement, must be designed to minimise erosion of the surrounding environment. <p><u>Construction planning</u></p> <ul style="list-style-type: none"> The construction site must be managed in a manner that prevents pollution to downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants. Berms and swathes must be placed in areas that may be prone to erosion. Temporary cut-off drains and berms may be required to capture storm water and promote infiltration.
	Waste Management	<p><u>Design and planning phase:</u></p> <ul style="list-style-type: none"> A method statement must be developed by the project manager or contractor prior to construction, including considerations for stormwater, erosion, waste and alien vegetation management, as well as site rehabilitation and maintenance considerations. This method statement must



THEME	POTENTIAL ISSUES	MITIGATION MEASURES
		<p>be approved by the appointed ECO.</p> <ul style="list-style-type: none"> This method statement should include waste management considerations for handling onsite general and hazardous waste during the construction and operation phases must be developed and implemented during construction. An appropriate area must be identified where waste can be stored before disposal. All hazardous substances such as paints, diesel and cement must be stored in a secure bunded area with an impermeable surface beneath them. <p><u>Construction phase:</u></p> <ul style="list-style-type: none"> All general waste must be disposed of in bins/waste skips labelled "general waste". Sufficient waste bins must be provided throughout the construction site for collecting waste. All general waste collected on site must be disposed of at a licensed general waste disposal site. All hazardous waste generated on site must be placed in a temporary impermeable bunded containment area which must be disposed of at a hazardous landfill site or be collected by the appropriate service provider. Proof of receipt of hazardous waste by a licenced service provider must be maintained on the site. Adequate sanitary facilities must be provided for construction workers and they must be properly secured to the ground. Maintenance of the chemical toilets should be done on a regular basis to prevent any leakages. Concrete and cement must take place on an impermeable surface, and dried waste concrete and cement must be disposed of with building rubble. No concrete mixing must take place within 32 m of any watercourse.
	Material stockpiling	<p><u>Construction phase</u></p> <ul style="list-style-type: none"> Material stockpiles must be located away from sensitive areas and they must be monitored for erosion and alien vegetation. Material stockpile locations must be approved by the ECO.
Socio -economic	Job creation	<p><u>Design and planning</u></p> <ul style="list-style-type: none"> N/A
	Health and safety	<p><u>Design and planning</u></p> <ul style="list-style-type: none"> A health and safety plan in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) must be drawn up by and HSE officer prior to construction to ensure workers safety. <p><u>Construction phase</u></p> <ul style="list-style-type: none"> N/A
	On-site fire risk	<p><u>Design and planning</u></p> <ul style="list-style-type: none"> Emergency preparedness must be in place for both the construction and operational phases and before these



THEME	POTENTIAL ISSUES	MITIGATION MEASURES
		<p>phases commence. This should form part of the method statement.</p> <ul style="list-style-type: none"> Eskom Holdings SOC Ltd must plan for and put measures in place to prevent and deal with fires including the provision of firefighting equipment.
	Traffic	<p><u>Design and planning</u></p> <ul style="list-style-type: none"> Consultation with the local Road Traffic Unit should be done early in the planning phase and if deemed necessary, road traffic permits should be obtained for transporting parts, containers, materials and construction equipment to the site to the extent required. Make provision for traffic accommodation where construction activities impact on existing roads.
	Loss of agricultural job opportunities	<p><u>Design and planning</u></p> <ul style="list-style-type: none"> No mitigation required
	Air quality and dust control	<p><u>Construction phase</u></p> <ul style="list-style-type: none"> During windy periods un-surfaced and un-vegetated areas must be dampened down. Vegetation must be retained where possible as this will reduce dust travel Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register. Vehicles and construction plant must be serviced regularly so as to reduce excessive vehicle emissions
Rehabilitation and maintenance	Inadequate rehabilitation and maintenance	<p><u>Design and planning</u></p> <ul style="list-style-type: none"> A rehabilitation plan must be developed by the project manager or contractor as part of the method statement and implemented during construction and operation phases. This method statement must be approved by the appointed ECO.
Terrestrial environment	Reduced Faunal Habitat	<p>Mitigation Measures:</p> <ul style="list-style-type: none"> Search and clear the area prior to vegetation clearance. Any faunal species that may die as a result of construction must be recorded (photographed, GPS coordinates) and if somewhat intact, preserved and donated to SANBI. Any faunal species observed onsite must be recorded (photographed, GPS coordinates) and loaded onto iNaturalist. Staff and contractors are not permitted to capture, collect or eat any faunal species onsite. No mitigation measures are proposed for the no-go alternative.
	Disruption of Faunal Species and Potential Reduction in Abundance and Mortality of Faunal Species	<p>Mitigation Measures:</p> <ul style="list-style-type: none"> Search and clear the area prior to vegetation clearance. Any faunal species that may die as a result of construction must be recorded (photographed, GPS coordinates) and if somewhat intact, preserved and donated to SANBI. Any faunal species observed onsite must be recorded



THEME	POTENTIAL ISSUES	MITIGATION MEASURES
		<p>(photographed, GPS coordinates) and loaded onto iNaturalist.</p> <ul style="list-style-type: none"> Staff and contractors are not permitted to capture, collect or eat any faunal species onsite. No mitigation measures are proposed for the no-go alternative.
	Establishment of Alien Plant Species	<p>Mitigation Measures:</p> <ul style="list-style-type: none"> The site must be checked regularly for the presence of alien invasive species. An Alien Invasive Management Plan/ Method Statement must be compiled, implemented, and adhered to. <p>No mitigation measures are proposed for the no-go alternative</p>
	Disruption of Ecosystem Function and process	<p>Mitigation Measures:</p> <ul style="list-style-type: none"> Limit vegetation clearance to that which is strictly necessary. Use existing access roads and servitudes, where possible.
	Power line	<p>The following mitigation measures are proposed:</p> <ul style="list-style-type: none"> The construction contractor should clearly demarcate construction areas so as to minimise site disturbance. Phased, rather than indiscriminate clearing of the site to be undertaken. Vegetation clearing should be limited to species/specimens presenting a fire risk or clearance danger. The site should be kept neat and tidy. Littering should be fined, and the ECO should organise rubbish clean-ups on a regular basis. <p>Implement mitigation measures as recommended in the EMP.</p>
	Loss of high archaeological feature	<ul style="list-style-type: none"> No impact, mitigation not required.
	Loss of historically significant building and structures	<p>Mitigation not required.</p>
Visual Impact	Alternation of cultural landscape	<ul style="list-style-type: none"> Mitigation not required.
Heritage and cultural resources	Disturbance to graves/human burial sites	<ul style="list-style-type: none"> Human remains are usually observed when they are exposed through erosion. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials. If any human bones are found during the course of construction work then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed under a permit from SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be



THEME	POTENTIAL ISSUES	MITIGATION MEASURES
		disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met.

Table 4.3: Summary of mitigation measures associated with the operational phase

THEME	POTENTIAL ISSUES	MITIGATION MEASURES
Environmental policy	Legal and policy compliance	<ul style="list-style-type: none"> The proponent must ensure that operations of the 400 KV Overhead line is compliant with the relevant legislation and policy. These should include (but are not restricted to): NEMA, EA, EMP and any other permits/authorisations.
Built environment	Infrastructure	<ul style="list-style-type: none"> Regular maintenance and inspections of all infrastructure and services must be undertaken.
	Stormwater management	<ul style="list-style-type: none"> Stormwater management measures such as attenuation structures, channels, etc. must be properly maintained and monitored. If the stormwater management measures put in place are deemed insufficient, a qualified engineer must be approached to assist with additional storm water attenuation mechanisms and remediation.
	Waste Management	<ul style="list-style-type: none"> All general waste must be disposed of in bins/waste skips labelled "general waste". Sufficient waste bins must be provided throughout the construction site for collecting waste. All general waste collected on site must be disposed of at a licensed general waste disposal site. All hazardous waste generated on site must be placed in a temporary impermeable bunded containment area which must be disposed of at a hazardous landfill site or be collected by the appropriate service provider. Proof of receipt of hazardous waste by a licenced service provider must be maintained on the site. Adequate sanitary facilities must be provided for construction workers and they must be properly secured to the ground. Maintenance of the chemical toilets should be done on a regular basis to prevent any leakages.
Socio-economic	Job creation	<ul style="list-style-type: none"> N/A
	Health and safety	<ul style="list-style-type: none"> A health and safety plan in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) must be adhered to and enforced by a HSE officer to ensure workers safety. Railway safety protocols need to be implemented during construction and operational phases.
	Loss of agricultural	<ul style="list-style-type: none"> No mitigation required



THEME	POTENTIAL ISSUES	MITIGATION MEASURES
	job opportunities	
	Air quality and dust control	<ul style="list-style-type: none"> During windy periods un-surfaced and un-vegetated areas must be dampened down. Vegetation must be retained where possible as this will reduce dust travel. Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register. Vehicles and construction plant must be serviced regularly so as to reduce excessive vehicle emissions.
	On-site fire risk	<p>In order to reduce the risk of fires:</p> <ul style="list-style-type: none"> All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances. Smoking must not be permitted near flammable substances. All cooking must be done in demarcated areas that are safe in terms of runaway or uncontrolled fires. No open fires must be allowed on site. Fire extinguishers must be available onsite.
Rehabilitation and maintenance	Inadequate rehabilitation and maintenance	<ul style="list-style-type: none"> Disturbed areas will be rehabilitated/prepared to allow natural re-vegetation.
Terrestrial biodiversity and ecology	Infestation of Alien Plant Species	<p>Mitigation Measures:</p> <ul style="list-style-type: none"> The site must be checked regularly for the presence of alien invasive species. When alien invasive species are found, immediate action must be taken to remove them. An Alien Invasive Management Plan/ Method Statement must be compiled, implemented and adhered to. No mitigation measures are proposed for the no-go alternative.
Visual Impact	Impact of 400 kV OHL on visually sensitive receptors	<p>Due to the height and visibility of the 400 kV OHL, mitigation measures are limited.</p> <p>The following should be considered:</p> <ul style="list-style-type: none"> Consolidate impacts by aligning the proposed 400 kV OHL line adjacent to an existing power lines. Vegetation clearing/trimming within the servitude should be limited to species/specimens presenting a fire risk or clearance danger.

Table 4.4: Summary of the mitigation measures applicable to the decommissioning phase

THEME	POTENTIAL ISSUES	MITIGATION MEASURES
Visual impacts	Visual impact of decommissioning activity	<ul style="list-style-type: none"> The mitigation measures applicable to the construction phase will be applicable during the decommissioning phase as well.



5 ENVIRONMENTAL MANAGEMENT SYSTEM

5.1 REPORTING

5.1.1 Administration

Before the contractor begins construction in sensitive areas (e.g. river crossings and areas of indigenous vegetation), the Contractor must give the ECO and engineer a written method statement setting out the following:

- The type of construction activity;
- Locality where the activity will take place;
- Identification of impacts that might result from the activity;
- Identification of activities or aspects that may cause an impact;
- Methodology and/or specifications for impact prevention for each activity or aspect;
- Methodology and/or specific actions for impact containment for each activity or aspect;
- Emergency/disaster incident and reaction procedures; and
- Treatment and continued maintenance of impacted environment.

The contractor must provide such information in advance of any or all construction activities provided that new submissions will be given to the ECO and/or engineer whenever there is a change or variation to the original. The ECO and/or engineer must provide comment on the methodology and procedures proposed by the Contractor but he must not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor must demonstrate at inception and at least once during the contract that the approved measures and procedures function properly. An example of a Method Statement is provided in Annexure 1.

5.1.2 Record Keeping

The engineer and the ECO will monitor the contractor's adherence to the approved impact prevention procedures and the engineer must issue to the contractor a notice of non-compliance whenever transgressions are observed. The ECO must document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance must be documented and reported to the engineer in the monthly report. These reports must be made available to the authorities when requested.

The Contractor must ensure that an electronic filing system identifying all documentation related to the EMPr is established. A list of reports likely to be generated during all phases of the project is provided below, and all applicable documentation must be included in the environmental filing system catalogue or document retrieval index:

- Environmental Management Programme;
- Final design documents and diagrams issued to and by the Contractor;
- All communications detailing changes of design/scope that may have environmental implications;
- Complaints register;



- Medical reports;
- Incident and accident reports;
- Emergency preparedness and response plans;
- Copies of all relevant environmental legislation;
- All relevant permits; and
- All method statements from the Contractor for all phases of the project.

5.1.3 Document Control

The Contractor and resident engineer must be responsible for establishing a procedure for electronic or hard copy document control. The document control procedure must comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person;
- Every document must identify the personnel and their positions, who drafted and compiled the document, who reviewed and recommended approval, and who finally approved the document for distribution; and
- All documents must be dated, provided with a revision number and reference number, filed systematically, and retained for a five year period.

The Contractor must ensure that documents are periodically reviewed and revised, where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMP are performed.

5.2 PLANNING AND DESIGN, PRE-CONSTRUCTION AND CONSTRUCTION PHASE

5.2.1 Environmental Training and Awareness

The purpose of the environmental training is to communicate potential environmental impacts relating to construction activities to contractors to ensure that precautionary measures are undertaken to avoid and/or mitigate the impacts. Environmental awareness training sessions should be undertaken prior to any work commencing by any contractor or sub-contractor on site as well as throughout the construction phase. The ECO shall give initial EMP training prior to any work starting on site. The training record must be kept on the project file for each training session.

Where possible the presentation will be conducted in the language of the employees. The environmental training could, as a minimum, include the following:

- The importance of conforming with all environmental policies, procedures, plans and systems;
- The significant environmental impacts, actual or potential, which could result from their work activities;
- The environmental benefits of improved personal performance;
- The roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures
- The mitigation measures to be implemented when carrying out their work activities;
- The importance of not littering;



- The need to use water sparingly;
- Details of, and encouragement to, minimising the production of waste and re-use, recover and recycle waste where possible;
- Details regarding palaeontological, archaeological and historical sites which may be unearthed during construction, and the procedures to be followed should these be encountered;
- The procedures which should be followed should a grave or any other archaeological and/or palaeontological finds be encountered or unearthed during the construction phase;
- Details regarding flora and fauna of special concern, including protected/endangered plant and animal species, and the procedures to be followed should these be encountered during construction.

5.2.2 EMPr training and awareness before commencement of construction

- Eskom will provide an Environmental Management Plan and Awareness Training for all employees of the Contractor, sub-contractor, consultants, agents, visitors and suppliers. The initial training workshop will be held prior to any work commencing on site. The Contractors shall ensure that all construction personnel, including senior route staff, sub-contractors and suppliers etc., attend the environmental awareness-training prior to commencing any work i.e., camp establishment, clearing and installations. Additional staff, sub-contractors and suppliers coming on to the route must attend an environmental awareness workshop prior to the commencing their duties. Subsequent training and awareness sessions will be arranged at a mutually agreed time and venue.
- The main contractor must provide the ECO with (a) a list of all sub-contractors and their scope of work for the contract and (b) a time schedule of works before the initial environmental training awareness session is scheduled. This will assist the ECO to schedule subsequent EMPr awareness training sessions as and when required.
- No construction work may take place on site unless under the supervision of a person who has attended an Environmental Awareness session.
- The PC shall inform the environmental practitioner prior to starting construction, so that training can be given.

5.2.3 EMPr awareness training throughout the construction phase

- EMPr awareness training must be given to new contractors and sub-contractors that start to work on site throughout the construction phase at various stages.
- All contractor and sub-contractor teams involved in work on site must be briefed on their obligations towards environmental controls and methodologies in terms of this EMPr prior to commencement of any construction and construction related activities on an on-going basis throughout the construction phase.
- In the case of new workers coming on site throughout the construction programme, the site contractor is responsible to ensure all new labour arriving on site is made aware of the contents of the EMPr and is briefed on the Environmental Awareness Training session.
- A register must be kept of all training given to contractors and sub-contractors, indicating the date, time, venue, attendees, name of trainer, name of contractor, signatures and unique numbers / identity numbers of attendees.
- If the construction is phased and the activities are different, a training session must be conducted before the commencement of each phase. The environmental issues, construction



impacts and mitigation measures for each phase must be discussed in detail at this training session.

5.2.4 Construction Site

- Accommodation for labourers must either be limited to guarding personnel on the construction site (with labourers transported daily to and from the site) or a separate fenced and controlled area where proper accommodation and relevant ablution and washing facilities are provided.
- The location of the construction site must be negotiated with the relevant landowner and specifications of the landowner must be adhered to.
- The construction site office and storage areas for material and equipment must be fenced in to prevent impacts and human interference to spread further than the site.
- Storage facilities for construction equipment must be provided for.
- Encourage the construction contractor to employ local people as far as is reasonably practical and encourage the contractor to transport them daily to and from the site. This would reduce solid and liquid waste production and water demand at the site camps.
- Contractors should develop a comprehensive site camp management plan. This should apply even in the case of the limited accommodation camps as discussed above.
- Plan site campsites an appropriate distance from any facility where it can cause a nuisance and could cause a safety hazard (in terms of mining activities such as blasting).
- Minimise on-site storage of petroleum products.
- Ensure proper maintenance procedures in place for vehicles and equipment.
- Servicing of vehicles to be in designated areas with appropriate spill management procedures in place.
- Ensure measures to contain spills readily available on site (spill kits).
- Sufficient ablution and proper cooking facilities must be provided at the site camp.
- Deposit solid domestic waste in containers and dispose at municipal waste disposal sites regularly.
- Dispose of liquid waste (grey water) with sewerage.
- Install appropriate facilities at the campsite. Preferably utilise municipal systems (conservancy tanks with periodic removal) or chemical toilets.
- Ensure compliance with stringent daily clean up requirements of site camp inert waste (waste concrete, reinforcing rods, waste bags, wire, timber etc) and dispose at municipal waste disposal sites.

5.2.5 On-site Communication Procedure

On site start-up / kick-off meeting

- The mandatory on-site start-up meeting that is conducted preferably 14 days but not less than 5 working days prior to commencement of any site/camp establishment, earthworks and/or construction activities and will relate to additional discussed information that must be complied with during the entire construction phase.
- All site-specific issues and arrangements as discussed and agreed on at the site start-up meeting.
- Information pertaining to specific site construction agreements that was discussed at the kick-off meeting on site by all the relevant parties and agreed on and must be recorded and included as part of the EMPr.



- Any changes made to the EMPr as per the agreements between all parties on site must still fall within the conditions of the Environmental Authorisation.
- At the site start-up meeting, the following issues must be discussed:
 - The Construction EMPr & other relevant site documents
 - Project to be discussed and all uncertainties are cleared
 - Method statement/s to be discussed
 - Access routes
 - Road and construction area to be demarcated
 - Materials stockpile and lay down areas to be demarcated
 - Method of stockpiling to be discussed
 - Firefighting procedures
 - Mandatory firefighting equipment & fire preventative measures
 - Mandatory site equipment and facilities
 - Solid waste facilities and removal intentions
 - Placement, type and service of toilets to be agreed on
 - Placement and type of rubbish bins and removal of rubbish to be agreed on
 - Environmental Education and awareness training session to all contractors & onsite staff/labour.
 - Location & establishment of concrete batching plant facility.

Monthly construction progress meetings

- Environmental matters pertaining to the construction of the project must be included as an agenda item on the monthly project construction progress meeting.
- The ECO must be invited to monthly construction progress meetings to discuss findings of site audits, mitigation measures and other issues arising pertaining to the implementation of the EMPr conditions.

Minutes of meetings

- Environmental issues, action items, complaints, incidents and mitigation measures must be recorded in minutes of monthly construction project meetings.
- The ECO must be included in the circulation of minutes of meetings in order to stay informed of construction progress and construction issues as they relate to the receiving environment.

5.2.6 Design

- The engineering drawings must adhere to any site-specific mitigation measures (if applicable) supplied by a geotechnical engineer for the project in order to accommodate the geotechnical and earth-scientific constraints in terms of founding and construction methods, construction materials, excavation, etc.
- The engineers must ensure that all new light fixtures associated with the substation provide precisely directed illumination to reduce light spillage beyond the immediate surrounds of the substation site (if applicable).
- A surface runoff management plan indicating the management of all surface runoff generated as a result of the development (during construction and operation) must be compiled. This is specifically relevant to the substation site (if applicable). It should indicate how water velocities will be reduced before stormwater enters natural channels and how natural processes for water



infiltration of the affected landscape will be accommodated. This study is to be commissioned by Eskom Engineering or done by an internal Engineer, and to be included in the substation's design specification Terms of Reference.

- The design should incorporate storm water management during and post construction.
- The Engineers must integrate the requirements specified by the ecologists for the project as supplied in the EIA Report. The risk maps providing details in terms of the vegetation, rivers and streams, specifically the buffer zones, are supplied in Appendix A of the EIA Report and must be implemented.
- All construction activities (including temporary construction camp site, ablution facilities, etc.) must be limited to sites outside the proposed buffer zones.
- The engineers must take note that no development may take place in any watercourses as described in the National Water Act in the absence of authorisation from the Department of Water and Sanitation. Water Use authorisation, or else if applicable General Authorisation, must be received from the Department prior to commencement of construction.

5.2.7 Servitude Agreements and Site Requirements

Independent evaluators must be appointed by Eskom in the process of negotiation in terms of compensation with the relevant landowners. During this process site-specific issues must be addressed that include the following:

- Specific placement of pylons so as not to interfere with farming activities; infrastructure and sensitive environmental features;
- Access and control requirements (i.e. gates, fencing; access roads; etc.);
- Communication channels during ongoing maintenance and inspection of the power line (relevant personnel with contact details; etc.);
- Communication channels emergency situations (i.e. power failures; veld fires; etc.);
- Clearing of vegetation (i.e. selective clearing; what to do with the cuttings (removal or place in heaps for the landowner for firewood; etc.).

Planning and development with regards to agricultural activities

- The time of construction activities planned on agricultural land must be negotiated with the farmer to ensure that construction activities do not unnecessarily interfere with agricultural activities such as harvest time.

Eskom representatives must liaise personally with every directly affected landowner prior to any construction activities taking place. A detailed schedule (inclusive of postal addresses and/or fax and e-mail numbers) of affected landowners and other key stakeholders are included as the Register of Interested & Affected Parties in Appendix E of the Environmental Impact Report. The objectives of this liaison will be the following:

- To identify the most effective time schedule for construction activities to take place on the applicable properties;
- To confirm access routes and Eskom gate localities;
- To confirm site-specific requirements as identified during the EIA process;
- To identify any additional site-specific issues with reasonable mitigatory measures that had not been identified and documented during the Public Participation Procedures of the Environmental Impact Assessment process undertaken for this project;



- To update the contact details of affected landowners in case access to properties are required for both maintenance and emergency situations;
- To confirm the contact details of the contractor and Eskom representatives to ensure effective communication during the construction and operational phases of the project.

Construction workers should wear clearly identifiable clothing that allows for easy recognition of contract workers on private property.

A copy of this EMPr must be submitted to relevant landowners should they request it. They can assist Eskom in assuring that the contractor adheres to rules as stipulated and that mitigation measures are applied. They can also assist with measures to ensure that farming activities (if required) can continue under the power line. The exact placement of pylons and the height thereof must be designed to accommodate any spill points, if relevant.

Access roads

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

5.2.8 Waste Management

General Waste

- Expected constructed waste (unused steel, conductor cables, cement or concrete) and general waste around the construction site (plastic, tins and paper) may degrade the environment if not disposed in the correct manner.
- Littering or illegal dumping of any waste material is prohibited.
- No waste disposal holes may be made on site.
- Under no circumstances should waste be burnt on site.
- Waste separation should be encouraged for recycling purposes.
- Provision must be made for the collection of all general waste materials. Rubbish bags and bins with lids must be provided at various points within the construction corridor and must be emptied on a regular basis.
- Deposit solid domestic waste in containers and dispose at registered municipal waste disposal sites regularly.
- For all waste that is disposed of, Eskom shall obtain waste manifests and disposal certificates, which shall be recorded and reported to the ECO on a monthly basis.
- Liquid waste (grey water) must be disposed with sewerage

Construction Waste

- Ensure compliance with stringent daily clean up requirements of site camp inert waste (waste concrete, reinforcing rods, waste bags, wire, timber etc) and dispose at municipal waste disposal sites.
- Construction waste must be collected and sold for recycling purposes as far as possible.



Sewage

- Portable ablution facilities must be placed within the construction servitude and must be serviced by registered companies only and on a regular basis. There should be one toilet for every fifteen workers.
- No effluent to be dumped in the veld or any watercourse.
- The use of the open veld for ablution is prohibited

Hazardous Waste

- Oil contaminated waste (soil, cloths used to clean small spills, spill kits, content of drip trays, etc.) must be disposed of at a facility that is registered as a hazardous landfill facility.
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled. All these hazardous substances should be disposed of at a H:H registered waste disposal facility.
- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- Persons who remove hazardous waste must be appropriately qualified and authorised.
- If diesel/petrol refuelling is to take place on the site a special area must be demarcated for this purpose. This area should be paved with an underlying layer that will prevent leakages or spills from reaching the subsurface soil or underground water table.
- No refuelling of any vehicle is allowed within the power line corridor or in the adjacent natural areas.

5.2.9 Ground and Surface Water

- In all cases, abstraction of water from watercourses for construction purposes will not be allowed. Arrangements must be made prior to construction with the landowners or municipal water must be carted in.
- Under no circumstances must surface or groundwater be polluted.
- Adequate oil containment precautions must be taken.
- If a spill from a construction vehicle occurs it must be reported to ECO with immediate effect. A bio-remediation contractor must be appointed to rehabilitate large oil spills. Small oil spills must be cleaned immediately with an oil spill kit. Spills must be immediately stopped and a drip tray be used to catch any leaks until the risk can be eliminated and mitigation/ rehabilitation measures applied
- Minimise on-site storage of petroleum products.
- Ensure proper maintenance procedures are in place for vehicles and equipment.
- Servicing of vehicles to be done in designated areas with appropriate spill management procedures in place.
- Ensure that measures to contain spills are readily available on site (spill kits).
- All hazardous substance spills must be reported, recorded and investigated.
- All stormwater runoff must be managed efficiently so as to avoid stormwater damage and erosion to adjacent properties.
- During and after construction, stormwater control measures should be implemented especially around stockpiled soil, excavated areas, trenches etc. to avoid the export of soil into any watercourse.



- Stormwater should not be discharged into the working areas and it should be ensured that stormwater leaving the footprint of the proposed development areas is not contaminated by any substance, whether that substance is solid, liquid, vapor or any combination thereof.
- Stockpiling of construction material and soils should be such that pollution of water resources is prevented and that the materials will be retained in a storm event.
- Drinking water and water for ablution facilities must be provided to all construction workers on the construction site.

5.2.10 Rivers and Streams

All conditions of the Department of Water and Sanitation in the Water Use License or General Authorisation (whichever is applicable) must be implemented and adhered to.

Direct modification or loss of aquatic habitat

- As far as possible existing access roads should be utilised to minimise the extent of disturbance in the area. Access roads should be contoured along any steep slope. Run-off over the exposed areas and within the drainage lines should be mitigated to reduce the rate and volume of run-off and prevent erosion.
- Any of the cleared areas that are not hardened surfaces should be rehabilitated after construction is completed by re-vegetating the areas disturbed by the construction activities with suitable indigenous plants.

Potential flow impact

- Invasive alien plant growth occurring within the immediate area of the construction activities should be removed and any regrowth prevented.
- As far as possible existing access roads should be utilised to minimise the extent of disturbance in the area. New access roads should be contoured along any steep slope. Run-off over the exposed areas and within the drainage lines should be mitigated to reduce the rate and volume of run-off and prevent erosion.
- Any of the cleared areas that are not hardened surfaces should be rehabilitated after construction is completed by re-vegetating the areas disturbed by the construction activities with suitable indigenous plants. Invasive alien plant growth occurring within the immediate area of the construction activities should be removed and any regrowth prevented.

Water quality impact

- Contaminated runoff from construction should be prevented from entering the river. All materials on the construction site should be properly stored and contained. Disposal of waste from the site should also be properly managed. Construction workers should be given ablution facilities at the construction site that are located outside of the recommended buffer for the river and regularly serviced.
- Contaminated runoff from construction should be prevented from entering the river. All materials on the construction site should be properly stored and contained. Disposal of waste from the site should also be properly managed. Construction workers should be given ablution facilities at the construction site that are located outside of the recommended buffer for the river and regularly serviced. These measures should be addressed, implemented and monitored in terms of the Environmental Management Plan for the construction phase.



- Maintenance of infrastructure related to the project should only take place via the designated access routes. Disturbed areas along the access routes should be monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth.

5.2.11 Freshwater Resources

- The pylons may be constructed within the recommend buffer but not within any of the mapped riparian zone (refer to Addendum A of this EMPr). The overhead powerlines may however cross over the riparian zones and the river.
- Small drainage features also drain the hillside south of the river. These features do not drain into the river and do not provide any aquatic habitat of significance but simply provide a conduit for water draining the steep bank south of the Orange River. These drainage lines should preferably be avoided.

5.2.12 Dust Control

- Speed limits must be strictly adhered to in order to limit the levels of dust pollution.
- Should any complaints from landowners be received (i.e. dust on crops), Eskom should attend to it immediately and appropriate dust control measures should be discussed with the landowners and implemented (i.e. speed calming measures).

5.2.13 Fire Management

Eskom will manage the fire risk within the servitude from a fire risk point of view and the field service office will be in close communication with the fire protection agency in the area. Reducing the vegetation load and managing the alien vegetation will also contribute to the prevention and the spreading of fires. The servitude itself can in many cases act as fire break within the landscape.

The following are applicable to both the construction and operational phases:

- No fires may be made for the burning of vegetation and waste, neither as source of heat or cooking.
- No open fires are to be made on site – cooking facilities must be provided, particularly for security staff.
- Branches and other debris resulting from pruning processes should not be left in areas where it will pose a risk to infrastructure.
- Fires shall not be made for the purpose of chasing or disturbing any fauna.
- The adjacent landowners must be informed and/or involved in case of any fire that may pose a threat to their properties.
- It must be ensured that the basic firefighting equipment is supplied to all living quarters, site offices, kitchen areas, workshop areas and stores and be kept available during construction phase.
- Welding gas cutting or cutting of metal will only be allowed inside the working/demarcated areas and with appropriate firefighting equipment at hand.



5.2.14 Emergency Management

All emergency incidents should be investigated in terms of Eskom's EPC 32-95: Safety, Health & Environmental Incident Management Procedure, in addition to any ELC requirement. This procedure describes the high-level intention for the effective incident management of work-related incidents as well as environmental damage. The aim of this procedure is to ensure and facilitate the effective and efficient management of incidents from the moment that one occurs, until it can be audited that corrective and preventive measures were developed and taken. This procedure is supported by annexes which set out the detailed rules, requirements and action steps as well as useful examples and templates. These two have to be read and applied together to ensure that the aim of this procedure and its supporting annexes is met.

An **Emergency Incident** can be defined as an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed. It is also an accident involving the spilling of a harmful substance that finds or may find its way into a water resource.

An **Environmental Incident** can be defined as pollution, erosion, cutting of protected and/or indigenous trees, hazardous substance spillages, wildlife interactions, public complaints and loss of biodiversity caused by Eskom Distribution's activities, as well as non-compliance to legislation such as Environmental Authorisations, Record of Decisions, permits and licences

Fire

- The adjacent landowners will be informed and/or involved in case of any fire that poses a threat to landowners.
- It must be ensured that the basic firefighting equipment is supplied to all living quarters, site offices, kitchen areas, workshop areas and stores.
- Welding gas cutting or cutting of metal will only be allowed inside the working/demarcated areas and with appropriate firefighting equipment at hand.

Accidental leaks and spillages

- Streams, rivers, underground water and dams will be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, wash water, organic materials and bituminous products.
- In the event of a spillage during the construction phase, the responsibility for spill treatment will be with Eskom and Eskom will be liable to arrange for competent assistance to clear the affected area.
- Eskom will compile and maintain environmental emergency procedure, to ensure that there will be an appropriate rapid response to unexpected or accidental environmental related incidents throughout the life cycle of the project.
- Incidents must be reported in line with OU Oil Spill Management Instruction and the Eskom's Incident Management Procedure. The incident must be reported within 24 hours via a flash report.
- The Environmental Control Officer (ECO) will assess the situation and act as required in all cases; the immediate response will be to contain the spill. The exact treatment of soil/water pollution will be determined by the ECO.



- Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice must be sought for appropriate treatment and remedial procedures to be followed. The costs of containment and rehabilitation will be for Eskom's account, including the costs of specialist input.
- Hazardous substance spillages
- Hazardous substance spillages can be defined as any hazardous liquids or substances spilt that have the potential to pollute aquatic or terrestrial ecosystems or present a health hazard to other living organisms.
- The Eskom construction team shall have an oil spill kit on site and where working with hazardous substances, also drip trays on trucks.
- Vegetated areas cleared of hazardous waste will be re-vegetated.

5.2.15 Protection of Natural Features

- The Contractor must not deface, paint, damage or mark any natural features (e.g. rock formations) situated in or around the site for survey or other purposes unless agreed beforehand with the ECO. Any features affected by the Contractor in contravention of this clause must be restored / rehabilitated to the satisfaction of the ECO.
- The Contractor must not permit his employees to make use of any natural water sources for the purposes of swimming, personal washing and the washing of **construction equipment** or clothes.

5.2.16 Protection of Flora and Fauna

Protected trees

It is important to take into consideration during the planning phase of the project the fact that the total width of the servitude may not be cleared of protected trees. The Department of Agriculture, Forestry & Fisheries, together with Eskom developed a document in 2012 titled: "Basic Guidelines for the handling of EIAs and License Applications for Eskom SOC Holdings Linear Infrastructure affecting Natural Forests, Protected Trees or State Forests". According to this document and in relation to new planned Eskom linear infrastructure, "protected trees do not need to be removed from the whole servitude, only from under the lines (this is not necessary for smaller tree species) and trees in the way of towers to be erected". The Northern Cape is a semi- arid region and unnecessary clearance of vegetation may expose soil, subjecting it to wind erosion that may take many years to recover after disturbance.

Protected plant species to the east of the existing substation

The substation will be expanded to the east of the existing substation and a Plant Rescue & Protection Management Plan must be compiled and implemented prior to construction to relocate the protected plant species to other suitable areas. The permitting requirements of the Northern Cape Department of Environment and Nature Conservation will then be confirmed to ensure compliance with the Northern Cape Provincial Act (Act 9 of 2009).

Fauna

Educational programmes for the contractor's staff must be implemented to ensure that project workers are alerted to the possibility of snakes being found during vegetation clearance. The construction team must be briefed about the management of snakes in such instances. In particular,



construction workers are to go through ongoing refresher courses to ensure that threatened snakes, such as Southern African Python, are not killed or persecuted when found.

5.2.17 Avifauna

Nocturnal light emitting diode (LED) mitigation device diverters must be installed on the full span length on the earthwire of each of the spans crossing the Orange River according to Eskom guidelines. These devices are a combination of the basic bird flapper and bird flight diverter concepts, but are equipped with a solar panel which powers flashing LED lights throughout the night to prevent mortalities of bird species flying at night and in thick mist.

For the restriction and/or prevention of disturbance to birds and destruction of their habitat, the following will apply:

- Disturbance to and killing of birds must be prevented.
- Unnecessary habitat destruction must be avoided.
- The removal of large trees should be avoided if at all possible.
- Construction activity should be restricted to the immediate footprint of the infrastructure. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.
- Measures to control noise should be applied according to current best practice in the industry.
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
- The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.
- All dismantling, construction and maintenance activities must be carried out according to best environmental practice principles so as to minimise habitat destruction (see in this respect the Eskom Environmental Procedure, EPC 32-96). The unnecessary removal of large trees is not allowed (see also in this respect the Procedure for Vegetation Clearance and Maintenance within Eskom owned land, EPC 32-247).

5.2.18 Protection of Heritage Features

- No sites of cultural heritage significance are located in the surveyed area, but many stone tools have however been noted.
- It should always be realised that the subterranean presence of archaeological and/or historical sites, features or artefacts is a distinct possibility and it could be found during the course of construction work. Care should therefore be taken, when development work commences, that if any of these are accidentally discovered, a qualified archaeologist be called in to investigate. The results of such an investigation should be submitted to SAHRA.

5.2.19 Preparation of Servitude / Vegetation Clearance

- The procedures for vegetation clearance and maintenance within overhead power line servitudes and on Eskom owned land, updated September 2009 or latest approved revision thereafter, must be implemented (EPC 32-247).
- Vegetation clearance is often one of the very first activities of construction. The Project Coordinator shall inform the ECO before the vegetation clearance contract is issued. Vegetation



clearance is considered commencement of construction. Eskom needs to notify the DEA of its intention to commence with construction before vegetation clearance can commence.

- The object of vegetation clearing is to trim, cut or clear the minimum number of trees and vegetation necessary for the safe mechanical construction and electrical operation of the transmission line.
- Indigenous vegetation which does not interfere with the safe operation of the power line should be left undisturbed.
- Clearing for pylon positions must be done to the minimum required for that specific pylon.
- Vegetation clearing during construction must be restricted to the footprint of the substation infrastructure only and the power line servitude.
- No scalping shall be allowed on any part of the servitude road unless absolutely necessary.
- Any alien invasive trees with large root systems shall be cut manually and removed, as the use of a bulldozer will cause major damage to the soil when the root systems are removed. Stumps shall be treated with herbicide. Smaller vegetation can be flattened with a machine, but the blade should be kept above ground level to prevent scalping.
- Any vegetation cleared on a tower site shall be removed or flattened and not be pushed to form an embankment around the tower.
- Disturbed areas of natural vegetation as well as cut and fills must be rehabilitated immediately to prevent soil erosion as well as alien invasive vegetation invasion. This is especially relevant adjacent to the non-perennial drainage lines and seasonally inundated depressions.

➤ **Herbicides**

- The use of herbicides shall only be allowed after a proper investigation into the necessity, the type to be used, Eskom's approval for the use of herbicides is mandatory. Application shall be under the direct supervision of a qualified technician. All surplus herbicide shall be disposed of in accordance with the supplier's specifications. All alien vegetation in the total servitude and densifiers creating a fire hazard shall be cleared and treated with herbicides.
- It is recommended that a contractor for vegetation clearing should comply with the following parameters:
 - The contractor must have the necessary knowledge to be able to identify protected species Camel Thorn (*Vachelia* (*Acacia*) *erioloba*); as well indigenous species not interfering with the operation of the line due to their height and growth rate.
 - The contractor must also be able to identify declared weeds and alien species (*Prosopis glandulosa**, *Nicotiana* spp.) that can be totally eradicated.
 - The contractor must be in possession of a valid herbicide applicators license.

➤ **Access roads**

- Existing access roads must be used as far as possible and the creation of new access tracks for power line construction should be minimised.
- Unnecessary impacts (such as driving off road) on surrounding natural vegetation must be avoided.
- The Contractor shall properly mark all access roads. Markers shall show the direction of travel as well as tower numbers to which the road leads.



- Unnecessary traversing of adjacent open areas is discouraged especially within the open woodlands, open grasslands, non-perennial drainage lines and seasonal wetlands including Kalahari Salt Pans.
- Where required, speed limits shall be indicated on the roads. All speed limits shall be strictly adhered to at all time.
- Vehicle access to the power line servitude must as far as possible be limited to existing roads. If a new access road need to be constructed it should follow cleared areas such as livestock pathways where possible.

5.2.20 Control of Alien Vegetation

- Alien vegetation in servitudes shall be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. In terms of these regulations, Eskom shall “control” i.e. to combat Category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by Eskom
- The use of herbicides shall be in compliance with the terms and conditions of The Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947).
- All alien vegetation should be eradicated along the servitude. Invasive species (*Prosopis glandulosa*; *Nicotiana spp.*) should be given the highest priority.
- No dumping of any materials in undeveloped open areas and neighbouring properties.
- Activities in the surrounding open undeveloped areas (especially the rocky hills and koppies must be strictly regulated and managed.
- It is imperative that the construction activities as well as vegetation clearance are restricted to the power line servitude. The limitation of the disturbance of vegetation cover within the servitude will ameliorate this impact.

5.2.21 Revegetation

- All areas disturbed during construction must be reinstated to a state that approximates or better the state that they were in before construction.
- Cut and fill areas must be restored and reshaped.
- Areas compacted by vehicles during construction must be scarified to allow penetration of plant roots and the regrowth of natural vegetation.
- The revegetation programme must take cognisance of the climatic and seasonal conditions with the most favourable period being in spring and early summer.
- The rehabilitated areas will be weeded by the nominated rehabilitation contractor for a period of 1 year.
- Species indigenous and or endemic to the area, and suitable for rehabilitation, must be identified and used in preference to exotic species.
- Where possible, indigenous species cleared for construction, must be used to revegetate disturbed areas.
- It is also advised that the Environmental Control Officer, to be appointed during the construction phase, must have a good understanding of the local flora. The ECO must be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas, using species selected by an appropriate botanist. All alien plant re-growth must be monitored



and should it occur these plants must be eradicated.

5.2.22 Visual Impact

- Mitigation during the construction phase is possible but it revolves mainly around 'good housekeeping' i.e. suppression of dust at the substation site and along access roads during construction.
- It is proposed that as little vegetation as possible be removed during the construction phase.
- Ensure, wherever possible, all existing natural vegetation is retained and incorporated into the project site rehabilitation (bosque of trees to the south of the site).
- Dust suppression techniques should be in place always during the construction, operational, the decommissioning / closure phases.
- Only the footprint and a small 'construction buffer zone' around the proposed project should be exposed. In all other areas, the natural vegetation should be retained.
- It is suggested that trees should be planted along the eastern side of the substation. The trees will partially shield / screen the view of people living east of the project site.
- During construction, operation, rehabilitation and closure of the Project, access roads will require an effective dust suppression management programme, such as the use of non-polluting chemicals that will retain moisture in the road surface.

5.2.23 Soil Erosion

- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969.) Access roads and site surfaces must be monitored for deterioration and possible erosion. Pro-active measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil erosion.
- All cleared areas must be ripped and rehabilitated after construction. The top 200mm layer of topsoil must be removed and stockpiled in heaps not higher than 2m and replaced on the construction areas once the activities have been completed. The affected areas should be replanted with a grass mixture indigenous to the area.
- All vehicle movement must be along existing roads or tracks as far as possible.
- All storm-water runoff must be managed efficiently so as to avoid storm-water damage and erosion to adjacent properties.
- The viability of undertaking construction during the dry months of the year should be investigated in order to overcome possible problems caused by excessive moisture.
- Should any new temporary access roads be required, the following should apply in areas which are prone to erosion:
 - Where a cutting is made, subsoil drains should be installed wherever a perched water table occurs within 900m of the formation in all cuttings and below fills in the alluvial zones.
 - It is further critical to manage surface water. Drains should be provided along the top and bottom of all deep cuttings. This is to minimise the flow of surface water and erosion to the exposed cut faces and erosion along the toe of the cuttings.



- Steep sections of the service road must be supplied of sufficient drainage areas to reduce flow velocity of run-off water.
- Any eroded sections must be rehabilitated and part of the management plan must include regular inspections of the water run-off areas
- If any erosion occurs, rehabilitation must immediately be done.

5.2.24 Community Issues (Safety, Security, Noise, Dust, Etc.)

- Farm gates and fences must be left in the state it was found.
- Under no circumstances shall access be gained by cutting or “dropping” of fences. All gates shall be left closed and the Eskom servitude gates shall be securely locked at all times.
- Construction workers must be extremely careful not to damage any property along the proposed route. Should any damage occur it should be reported to the ECO and repaired and to a state prior to the damage to the written satisfaction of the landowner and ECO.
- Removal of agricultural products is prohibited.
- No firewood may be collected.
- No open fires are to be made on private property.
- In order to prevent and/or minimise crime, it is required that all construction workers be supplied with controlled serviced accommodation or be supplied with daily transport to and from the site.
- No wandering on adjacent properties is allowed, unless written consent has been obtained from the relevant landowners.
- All adjacent landowners have to be informed of the blasting programme (if applicable) prior to any blasting taking place. Contractors must liaise personally with adjacent landowners. All communication in this regard must be documented. Blasting may only be undertaken by specialists in the field and should be limited to small, localised areas. All relevant legislation must be adhered to.
- All construction workers will be allowed only for specified day light hours. Transport should be made available by the contractor to remove labourers from the site after working hours.
- Secure accommodation facilities must be provided for guarding personnel.
- Supervision of labourers must at all times take place.
- Construction hours will be restricted to specific periods that exclude Sundays and public holidays.
- Sweeping of construction sites, clearing of building rubble and debris and watering of construction sites (storage areas, roads, etc.) must take place on a regular basis.
- All excavated areas must be clearly marked and barrier tape must be placed around them to prevent humans and animals from falling into them.

5.2.25 Agricultural Activities

Domestic Livestock

- 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.
- 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.



- Should the Contractors workforce obtain any livestock for eating purposes, they must be in possession of a written note from the Landowner.
- 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.
- 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.
- Should the Contractors workforce obtain any livestock for eating purposes, they must be in possession of a written note from the Landowner.

5.2.26 Cultural-Historical Component

Should any evidence of archaeological sites or remains not previously identified (e.g. remnants or stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal/ash concentrations), unmarked human burials or other categories of heritage resources are found during construction activities, SAHRA APM Unit (Mr Philip Hine or Mrs Colette Scheermeyer, tel 021 462 4502) must immediately be alerted and an accredited professional archaeologist must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological significance, a Phase 2 rescue operation might be necessary.



6 ENVIRONMENTAL MANAGEMENT PROTOCOL

6.1 ROLES AND RESPONSIBILITIES

6.1.1 Applicant/Developer

The Applicant is the Developer and has overall responsibility for compliance with the EMPr as it is a fundamental component of the authorisation requirements for the project.

This means that the Developer must:

- Ensure that the professional team and the Contractors are appropriately briefed and that their appointment includes environmental requirements as relevant;
- Ensure that he/she is kept fully informed of the performance of the project against the requirements of the EMPr;
- Ensure that appropriate action is taken where consistent incidents of non-compliance are taking place;
- Ensure that any corrective action required by the authorities is implemented.

6.1.2 Project Co-ordinator (PC)

The primary responsibility of the Project Co-ordinator (PC) is to ensure that the Contractor complies with the environmental specifications in this document. In addition the PC shall:

- Assume overall responsibility for the effective implementation and administration of the EMPr;
- Ensure that the EMPr is included in the Contractors' contract (including all subcontractors);
- Ensure that the EMPr and any other relevant documentation are provided to the applicable contractors;
- Inform Environmental Practitioner of the date of construction at least 2 months in advance.

6.1.3 Construction Supervisor and the Contractor (if utilised)

- Undertake regular inspections of the Contractor's site (in conjunction with the Clerk of Works, where relevant) as well as the power line servitude in order to check for compliance with the EMPr in terms of the specifications outlined in this document.
- Keep a register of major incidents (spills, injuries, complaints, legal transgressions, etc.) and any other relevant issues related to the EMPr;
- Report any problems (or complaints) concerning the environment arising out of the construction phase to the appointed Environmental Control Officer;
- To ensure Contractor staff are trained in accordance with the EMPr;
- To implement recommendations of possible audits.
- The contractor environmental site representative to have the following training, from a recognised or accredited institution:
 - Oil Spill Management Training
 - Integrated Waste Management
 - Environmental Awareness /Induction
 - Tree Identification (vegetation management)
 - Environmental Law Training



- A minimum of 3-year Diploma/Degree in Environmental Management / Sciences or any related field
- Environmental Authorisation Environmental Management Plan (EA_EMPr) Training
- ▲ The environmental site representative to be permanently on site during construction.
- ▲ The environmental site representative should have an appointment letter stipulating roles and responsibilities.

6.1.4 Environmental Control Officer (ECO)

The key responsibility of the ECO is to ensure that all the conditions stipulated in the Environmental Authorisation are being adhered to and should monitor project compliance with the conditions of the Environmental Authorisation, environmental legislation and the recommendations of the EMPr:

- ▲ Ensuring the necessary environmental authorisations and permits, if any, has been obtained;
- ▲ Advising the Contractor on environmental issues within defined construction areas;
- ▲ Undertaking once-per-month site visits, or more if required to ensure compliance with this EMPr;
- ▲ Completing environmental checklists during site visits and keeping a photographic record of progress on site from an environmental perspective;
- ▲ Reporting back on any environmental issues/incidents to the DFFE as reported to by the Contractor; and ensure that DFFE is informed of work progress on site;
- ▲ Preparing an environmental audit report at the conclusion of the construction phase.
- ▲ Attending site meetings where applicable and where necessary inspect the construction site on a regular basis to ensure that the mitigation and rehabilitation measures are applied.
- ▲ Make reasonable amendments to the EMPr in co-operation with the contractor. Penalties for non-compliance must be enforced.
- ▲ 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.
- ▲ Any conservation authority/institution as listed in the List of Interested and Affected Parties for the project should be allowed reasonable access to the construction site on request and arrangement with the ECO and the contractor

6.2 COMPLIANCE MONITORING AND CORRECTIVE ACTION

Non-compliance with the specifications of the EMPr constitutes a Breach of Contract for which Eskom must be immediately notified accordingly. Eskom will be deemed not to have complied with the EMPr if:

- ▲ There is evidence of contravention of the EMPr specifications within the boundaries of the construction site, site extensions and access roads;
- ▲ There is contravention of the EMPr specifications which relate to activities outside the boundaries of the construction sites;
- ▲ Environmental damage ensues due to negligence;
- ▲ Construction activities take place outside the defined boundaries of the site;
- ▲ Eskom fails to comply with corrective or other instruction.

Non-compliance will be dealt with in terms of the contract documentations signed by the various parties.



Non – compliance	Penalty for non-compliance
PRE-CONSTRUCTION	
Failure to demarcate Construction area/working areas off before construction starts.	R10 000-R15 000
Failure to maintain demarcated area(s) throughout the construction phase	
Failure to demarcate stock piling area of building materials	R1 000
Fencing off the construction site with mesh fencing of 1.8m, where necessary or other suitable material as agreed on by ECO and contract specifications	R5 000
Sitting of access road/s to be approved by ECO & demarcated with stakes before any construction starts (if applicable)	R5 000
Temporary route used for construction must be determined on site with ECO (if applicable)	R1 000 - R5 000
Sensitive features that may be harmed/removed/harvested must be clearly marked or demarcated and all construction team must be made aware of this.	R2 500 - R5 000
Failure to give environmental awareness to Construction team and all sub-contractors of all environmental aspects that could lead to imposition of environmental penalties/fines and keep the proof on file.	R5 000 - R10 000
All appointed contractors must attend Environmental Training contractor to assure that all subcontractors be informed and signed DOU	
Method statements must be provided on request by the ECO. No work may commence until the Method Statement is accepted by the ECO/Project Coordinator and Clerk of Works and contractor representative.	R2 500 - R5 000
CONSTRUCTION	
Failure to keep a copy of the EMPr & Environmental Authorisation/Record of Decision (ROD) with all the conditions of approval and the relevant Method Statements must be kept on at site at all times.	R500 - R5 000
Construction team behaviour	R200 - R2 500
Construction team may not overnight on site.	
All noise and sound generated during all phases of the projects must comply with the relevant SANS codes and standards.	
Eating of meals only allowed in demarcated area	
No pets permitted on site	R5 000 - R10 000
Construction crew must stay within the demarcated construction area. (Applicable in sensitive sites)	
Failure to park all construction vehicle on the demarcated area and provision of any oil leaks must be made for example Drip trays	R1 000 - R5 000
Driving, parking and storing of construction equipment vehicles are only allowed inside demarcated areas and existing roads.	



Non – compliance	Penalty for non-compliance
Construction equipment may only be used on the road and may not disturb the vegetation on the sides of the road except if cleared by ECO. Construction equipment used must be carefully considered to limit environmental damage	R500 - R5 000
Failure to conduct bush clearing according to Eskom procedure for vegetation clearance and maintenance within the Overhead Power line Servitude and on Eskom owned land (refer to EPC 32-247)	R5 000 - R10 000
Failure to undertake herbicide spraying under the supervision of registered Pest Control Officer.	R5 000 - R10 000
Excavations	
No topsoil may be removed or altered outside the demarcated area and/or which was not specified. Storage of topsoil outside demarcated area to obtain permission from the landowner.	R5 000 - R10 000
Toilets	
Failure to put ablution facilities on site for the construction worker during the construction phase. These facilities must be used by the construction workers and be removed when the project is completed.	R2 500 - R5 000
Failure serviced the toilets regularly, (according to the manufacturer's instructions) and kept clean.	R1 000
Fire Prevention	
Failure to keep fire equipment on site at all times	R500 - R4 000
Failure to keep firefighting equipment to be in good working order and serviced.	R500 - R2 500
Keeping of open fire on site, this pose a risk of fire.	R1 000 - R5 000
Dust pollution control	
Failure to suppress dust through regular water spraying the emitted during the construction phase (Site specific/weather Dependent)	R500 - R5 000
Water run-off	
No contamination of water bodies, rivers, dams or wetlands is permitted	R5 000 - R15 000
Failure to take special care where the power line will cross river, streams or wetlands.	R2 500 - R10 000
Waste Management	
Failure to provide dust bins/skip on site in order to handle all waste litter generated during construction phase of the project.	R500 - R5 000
General litter / building refuse must be cleaned up on a regular basis from the site	R300 - R5 000
Cement-contaminated water, paint, oil, cement slurries, etc. must be stored in watertight containers or as agreed with ECO	R500 - R5 000
Failure to report oil spillage to ECO via flash report within 24 hours of the spill occurring	R2 500 - R5 000
Any cement / concrete spillage to be cleaned up immediately.	R500 - R5 000
Ready-mix delivery trucks must not carry out the wash down of their trucks on or around the site unless arranged with ECO.	
Waste must be disposed of at an official waste deposit site on a regular basis. Keep the proof on file, waste manifest.	R5 000 - R10 000



Non – compliance	Penalty for non-compliance
The absence of or inadequate drip trays or binding facilities for onsite oil leakage	R200 - R5 000
Failure to clean up oil/fuel leaks from on-site construction equipment	
Failure to keep oil spill remediation chemicals on site.	
Soil erosion	
Failure to prevent degradation and soil erosion on the construction site.	R500 - R5 000
Failure to notify property owners of the construction before commencement and obtain the permission in writing and keep on file.	R2 500 - R5 000
Rehabilitation	
Failure to remove rocks and stones/stock pile in area recommended by ECO	R500 - R5 000
Failure to remove all old concrete and alien materials from site	R500 - R5 000
Failure to clear all waste and building material on site before commissioning of the project	R500 - R5 000
General	
Failure to comply with the Environmental Conditions of the approved Environmental Authorisation	R5 000 - R20 000

6.3 ADDITIONAL MITIGATION MEASURES

As part of the implementation and monitoring requirements, the employees involved in the proposed development must be trained in implementing and monitoring compliance with the EMPr and EA and to undertake the necessary monitoring and implementation of the prescribed mitigation measures detailed here.

6.3.1 Pre-Construction

- ⬆ Notice must be given to surrounding landowners and businesses informing them of the intended date of commencement of construction.
- ⬆ The necessary management plans need to be compiled. These include Traffic, Waste, Alien Vegetation and Archaeological Site Management Plans.

6.3.2 Construction Phase

- ⬆ An ECO must be appointed to ensure that the construction activities remain within the designated area and that no unauthorised activities occur;
- ⬆ The ECO must submit site monitoring reports detailing the applicant's compliance with the EMPr;
- ⬆ An independent auditor must be appointed to undertake site audits that are in compliance with Regulation 34 of the NEMA EIA Regulations, 2014 (as amended);
- ⬆ An efficient storm water management system must be implemented during construction; and
- ⬆ Workers must be educated on environmental management aspects.



6.4 MONITORING

Construction activities have the potential to impact on a range of biophysical habitats as well as neighbouring communities. The monitoring programme which requires development by the Applicant, ECO and Contractor must, inter alia, allow for analysis of:

- 1) Air quality (such as dust);
- 2) Hydrocarbon pollution;
- 3) Success of local labour employment;
- 4) Success of local procurement policies;
- 5) Ambient and workplace noise;
- 6) Health and safety incidents;
- 7) Success of traffic management measures; and
- 8) Contamination and soil erosion.

Monitoring must continue into the operational phase and will require development with the applicant and an external environmental auditor. This monitoring must allow for the analysis of:

- 1) Hydrocarbon pollution;
- 2) Ambient and workplace noise;
- 3) Health and safety incidents;
- 4) Success of traffic management measures; and
- 5) Contamination and soil erosion.



7 ENVIRONMENTAL AWARENESS

Contractors must ensure that its employees and any third party who carries out all or part of the Contractor's obligations are adequately trained with regard to the implementation of the EMPr, as well as regarding environmental legal requirements and obligations. Training must be conducted by an independent person where necessary. Environment and health awareness training programmes must be targeted at two distinct levels of employment, i.e. management and labour. Environmental awareness training programmes must contain the following information:

- The names, positions and responsibilities of personnel to be trained;
- The framework for appropriate training plans;
- The summarised content of each training course; and
- A schedule for the presentation of the training courses.

The person conducting training must ensure that records of all training interventions are kept in accordance with the record keeping and documentation control requirements as set out in this EMPr. The training records must verify each of the targeted personnel's training experience.

The Developer must ensure that adequate environmental training takes place. All employees must have been given an induction presentation on environmental awareness and the content of the EMPr. The presentation needs to be conducted in the language of the employees to ensure it is understood. The environmental training must, as a minimum, include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities;
- Environmental legal requirements and obligations;
- Details regarding floral/faunal species of special concern and protected species, and the procedures to be followed should these be encountered during the construction of the bridge, main access roads, approach roads or construction camps;
- The importance of not littering;
- The importance of using supplied toilet facilities;
- The need to use water sparingly;
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible; and
- Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered.

The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed. If necessary, a translator must be called to the site to further explain aspects of environmental or



social behaviour that are unclear. An environmental training and awareness course has been provided in Annexure 2.



8 CONCLUSION

Although all foreseeable actions and potential mitigations or management actions are contained in this document, the EMPr must be seen as a day-to-day management document. The EMPr thus sets out the environmental standards that are required to minimise the negative impacts and maximise the positive benefits of the proposed construction of radio antennae and associated infrastructure, as detailed in the Basic Assessment Report (BAR). The EMPr is a “live document”, and if continuously reviewed and managed correctly can result in successful construction and operation of the proposed development.

All attempts must be made to have this EMPr available, as part of any tender documentation, so that the contractors are made aware of the potential cost and timing implications needed to fulfil the implementation of the EMPr, thus adequately costing for these. Further guidance must also be taken on any conditions contained in the EA, if the project is granted approval, and that these conditions must be incorporated into the final EMPr.



9 ANNEXURE 1: METHOD STATEMENTS

Method statements need to be compiled by the Contractor for approval by the ECO. For the purposes of the environmental specification, a method statement is defined as a written submission by the Contractor to the ECO setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, in such detail that the ECO is enabled to assess whether the Contractor's proposal is in accordance with the EMPr and / or will produce results in accordance with the EMPr and assist in enhancing performance against the conditions stipulated in the Environmental Authorisations..

The method statement must cover applicable details with regard to:

- Construction procedures,
- Materials and equipment to be used,
- Transporting 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 Specifications, and
- Any other information deemed necessary by the Engineer.

The Contractor must abide by these approved method statements, and any activity covered by a method statement must not commence until the ECO has approved the method statement. The method statement must be submitted to the ECO not less than 20 days prior to the intended date of commencement of the activity, or as directed by the ECO.



METHOD STATEMENT

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

PROPOSED ACTIVITY (give title of method statement):

--

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

--

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

Start Date:	End Date:

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

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated sketches and plans where possible):

--

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

**DECLARATIONS****1) ENVIRONMENTAL CONTROL OFFICER**

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(Signed)

(Print name)

Dated: _____

2) PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____








10 ANNEXURE 2: BASIC ENVIRONMENTAL EDUCATION COURSE OUTLINE







<http://www.webweaver.nu/clipart/environmental.shtml>

Reasons why should we look after the environment
















-  We have a right to a clean environment
-  A clean environment is essential to healthy living
-  All our basic needs come from the environment
-  A contract has been signed – development vs the environment
-  Penalties / fines could be issued

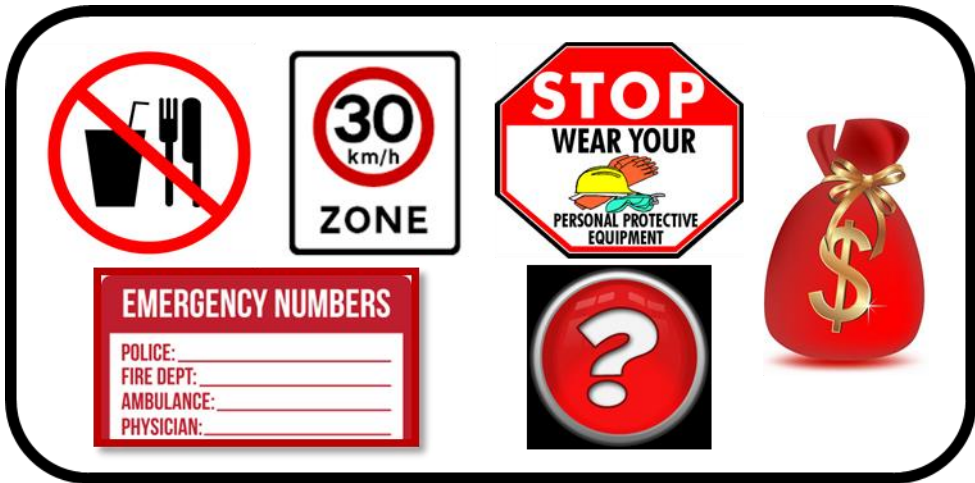


How to look after the environment

-  Report issues
-  Teamwork
-  Follow the set rules and guidelines (EA, EMPr, Method statements etc.)
-  Conserve, reuse and recycle

Tips and Guidelines

-  Workers and equipment should not be allowed outside demarcated areas
-  No swimming or polluting of water bodies allowed
-  No damage / disturbance to vegetation or water bodies without consent / permits
-  No disturbance allowed in no-go areas
-  No hunting of animals
-  Report all fires
-  No burning or burying of waste
-  No smoking near hazardous materials
-  Training on fire fighting equipment
-  Hazardous materials to be stored in designated and bunded areas
-  Spill kits and drip trays a must
-  Report all spills
-  Control dust and Noise
-  Maintain construction vehicles
-  Availability and maintenance of sanitation facilities





11 ANNEXURE 3: DETAILS AND CVS OF THE PROJECT TEAM

ALAN ROBERT CARTER *Curriculum Vitae*



CONTACT DETAILS

Name of Company	CES – Environmental and Social Advisory Services
Designation	Executive - East London and Port Elizabeth branches of CES
Profession	Environmental consultant and financial accountant
Years with firm	20 (twenty) + years
E-mail	a.carter@cesnet.co.za
Office number	+27 (0) 43 726-7809
Mobile	+27 (0) 83 379-9861
Nationality	South African
Professional Body	<ul style="list-style-type: none"> ➤ SACNASP: South African Council for Natural Scientific Profession ➤ EAPASA: Environmental Assessment Practitioners Association of South Africa ➤ IWMSA: Institute Waste Management Southern Africa ➤ TSBCPA: Texas State Board of Certified Public Accountants (USA) ➤ AICPA: American Institute of Certified Public Accountants (USA) ➤ Exemplar Global: Environmental Management Systems Auditor
Key areas of expertise	<ul style="list-style-type: none"> ➤ Environmental Impact Assessment ➤ Marine Ecology ➤ Environmental and coastal management ➤ Waste management ➤ Climate change and emissions inventories ➤ Financial accounting and project feasibility studies ➤ Environmental management systems, auditing and due-diligence

PROFILE

Alan has extensive training and experience in both financial accounting and environmental science disciplines with CES over the past 20 years and prior to that, with international accounting firms in South Africa and the USA. He holds a PhD in marine ecology and BCom Honours degree in financial accounting and auditing. He is also a member of the American Institute of Certified Public Accountants (licensed in Texas) and is a certified ISO14001 EMS auditor with Exemplar Global (formerly the American National Standards Institute). Alan has been responsible for leading and managing numerous and varied environmental and financial consulting projects over the past 30 years.



ALAN ROBERT CARTER

Curriculum Vitae



EMPLOYMENT EXPERIENCE

- January 2001 – Present: Executive (Coastal & Environmental Services, East London, South Africa)
- January 1999 – December 2001: Manager (Arthur Andersen LLP, Public Accounting Firm, Chicago, Illinois USA)
- December 1996 – December 1998: Senior Accountant/Auditor (Ernst & Young LLP, Public Accounting Firm, Austin, Texas, USA.)
- January 1994 – December 1996: Senior Accountant/Auditor (Ernst & Young, Charteris & Barnes, Chartered Accountants, East London, South Africa)
- July 1991 – December 1994: Associate Consultant (Coastal & Environmental Services, East London, South Africa)
- March 1989 – June 1990: Data Investigator (London Stock Exchange, London, England, United Kingdom)

ACADEMIC QUALIFICATIONS

- Ph.D. Plant Science (Marine) - Rhodes University 1987
- B. Compt. Hons. Accounting Science - University of South Africa 1997
- B. Com. Financial Accounting - Rhodes University 1995
- B.Sc. Hons. Plant Science - Rhodes University 1983
- B.Sc. Plant Science & Zoology - Rhodes University 1982

COURSES

- Environmental Management Systems Lead Auditor Training Course - American National Standards Institute and British Standards Institute (2000)
- ISO 14001:2015 Implementing Changes - British Standards Institute (2015)
- Numerous other workshops and training courses.

CONSULTING EXPERIENCE

Environmental Impact Assessment

- Managed numerous environmental impact assessment (EIA) projects (estimated at over 200 EIAs) and prepared EIA reports in terms of relevant EIA legislation and regulations (including World Bank and IFC Standards) for development proposals including: bulk water and waste water, roads, electrical, mining, ports, aquaculture, renewable energy (over 20 solar facilities and over 20 wind farms), industrial processes, housing developments, golf estates and resorts, etc. (2002 – present).
- Projects have also included preparation of applications in terms of other statutory requirements, such as water-use and mining licence /permit applications.
- Assisted City of Johannesburg in the process to proclaim four nature reserves in terms of relevant legislation (2015-2016).

Feasibility and Pre-feasibility Assessments

- Managed projects to develop pre-feasibility and feasibility assessments for various projects, including various tourism developments, aquaculture, infrastructure projects, etc.
- Managed project for the East London Industrial Development Zone (ELIDZ) to develop a Conceptual Framework for a Mariculture Zone within the ELIDZ (2009).
- Managed the following aquaculture feasibility studies:
 - Mariculture Zone at Qoloha on the South African Wild Coast (2013).
 - Mariculture Zone within the Coega Industrial Development Zone (2014).
 - Aquaponics Zone within the Coega Industrial Development Zone (2017).
 - Finfish cage farming within the Port of Richards Bay (2019).



ALAN ROBERT CARTER

Curriculum Vitae



- Multispecies aquaculture hatchery and demonstration facility in the Eastern Cape Province (2019).
- Managed project to determine the financial feasibility of various proposed tourism developments for the Kouga Development Agency in the Eastern Cape Province (2006)
- Contributed significantly to a study to determine the financial and environmental feasibility of three proposed tourism development projects at Coffee Bay on the Wild Coast (2004).

Strategic Environmental Assessment

- Managed Strategic Environmental Assessment (SEA) project toward the development of a Biofuel Industry in the Eastern Cape Province of South Africa (2014-2016)
- Managed Strategic Environmental Assessment (SEA) projects for two South African ports (2006 – 2007).
- Managed Strategic Environmental Assessment (SEA) projects for five (5) local municipalities in the Eastern Cape as part of the municipal Spatial Development Framework plans (2004 – 2005).
- Involved in the financial assessment of various land-use options and carbon credit potential as part of a larger Strategic Environmental Assessment (SEA) for assessing forestry potential in Water Catchment Area 12 in the Eastern Cape of South Africa (2006).

Climate change, emissions trading and renewable energy

- Provided specialist peer review services for National Department of Environmental Affairs relating to climate change impact assessments for large infrastructure projects (2017-2018).
- Conducted climate change impact assessment for a proposed coal-fired power station in Africa (2017-2018).
- Participated in the development of a web-based Monitoring & Evaluation (M&E) system for climate change Mitigation and Adaptation in South Africa for National Department of Environmental Affairs (DEA) (2015-2016).
- Managed project to develop a Climate Change Strategy for Buffalo City Metro Municipality (2013).
- Managed projects to develop climate change strategies for two district municipalities in the Eastern Cape Province (2011).
- Conducted specialist carbon stock and greenhouse gas emissions impact and life cycle assessment as part of the Environmental, Social and Health Impact Assessment for a proposed sugarcane to ethanol project in Sierra Leone (2009 - 2010) and a proposed Jatropha bio-diesel project in Mozambique (2009 - 2010).
- Managed project to develop the Eastern Cape Province Climate Change Strategy (2010).
- Managed project to develop a Transnet National Ports Authority Climate Change Risk Strategy (2009).
- Participated in a project to develop a Renewable Energy roadmap for the East London Industrial Development Zone (ELIDZ) (2013).
- Participated in a project for the East London Industrial Development Zone (ELIDZ) and Eastern Cape Government to prepare a Renewable Energy Strategy (2009).
- Contributed to the development of Arthur Andersen LLP's International Climate Change and Emissions Trading Services (2001).
- Conducted carbon credit (Clean Development Mechanism - CDM) feasibility assessment for a variety of renewable energy projects ranging from biogas to solar PV.



ALAN ROBERT CARTER

Curriculum Vitae



- Participated in the preparation of CDM applications for two solar PV projects in the Eastern Cape.

Waste Management

- Managed project to develop Integrated Waste Management Plans for six local municipalities on behalf of the Sarah Baartman District Municipality in the Eastern Cape Province (2016).
- Managed project to develop Integrated Waste Management Plans for four local municipalities on behalf of Alfred Nzo District Municipality in the Eastern Cape Province (2015).
- Managed project to develop Integrated Waste Management Plans for eight local municipalities on behalf of Chris Hani District Municipality in the Eastern Cape Province (2011).
- Managed a project to develop a zero-waste strategy for a community development in the Eastern Cape Province (2010).
- Managed waste management status quo analysis for a District Municipality in the Eastern Cape Province (2003).
- For three consecutive years, managed elements of the evaluation of the environmental financial reserves of the three largest solid waste companies (Waste Management, Inc., Republic Services, Inc., Allied Waste, Inc.) and number of smaller waste companies in the USA as part of the annual financial audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.
- Managed elements of the evaluation of the environmental financial reserves of the largest hazardous waste company in the USA (Safety-Kleen, Inc.), as part of the audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.

Environmental auditing and compliance

- Conducted environmental legal compliance audit for various large Transnet Freight Rail facilities (2018).
- Lead auditor for numerous Environmental Control Officer (ECO) projects, including construction of wind and solar farms, road infrastructure, bulk water and sewage infrastructure, port infrastructure, cemeteries, etc.
- Participated in numerous ISO14001 Environmental Management System (EMS) audits for large South African corporations including SAPPI, BHP Billiton, SAB Miller, Western Platinum Refinery, Dorbyl Group and others (2002 – present).
- Reviewed the SHE data reporting system of International Paper, Inc. (IP) for three successive years as part of the verification of the IP SHE Annual Report, which included environmental assessments of 12 IP pulp and paper mills located throughout the USA.

Environmental Due Diligence and Business Risk

- Participated in project on behalf of the CDC Group (UK) to conduct a due diligence on the ESG systems and mechanisms in place for an agro-industry investment entity with considerable agricultural investments throughout Africa (2021).
- Conducted environmental due diligence projects on behalf of the German Development Bank for a forestry pulp and paper operation in Swaziland (2010) and for a large diversified South African agricultural/agro-processing company (2011).
- Managed project for the Transnet National Ports Authority to identify the environmental risks and liabilities associated with the operations of the Port of Durban



ALAN ROBERT CARTER

Curriculum Vitae



as part of a broader National initiative to assess business and financial risks relating to environmental management (2006).

- Conducted sustainability and cost/benefit analysis of various waste water treatment options (including a marine pipeline at Hood Point) for the West Bank of East London (2004).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).
- Involved in the determination of the historical cost element of environmental remediation insurance claims for a number of multinational companies, including Dow Chemicals, Inc. and International Paper, Inc.
- Evaluated the environmental budgeting process of the US Army and provided best practice guidance for improving the process.

Policy and Guidelines

- Managed project to develop an Estuarine Management Plan for the Quinera Estuary for the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (2021).
- Development of Administration / Application Fee Structure for the Reclamation of Land, Coastal Use Permits, Coastal Waters Discharge Permits, Dumping of Waste at Sea, Off-Road Vehicle Regulations Promulgated in Terms of the National Environmental Management Act: Integrated Coastal Management Act (Act No. 24 Of 2008) (2017).
- Managed project to develop an Estuarine Management Plan for the Buffalo River Estuary for the National Department of Environmental Affairs (2017).
- Managed project to develop a Coastal Management Programme for Amathole District Municipality, Eastern Cape (2015 – 2016).
- Managed project to develop a sustainability diagnostic report as part of the development of the Eastern Cape Development Plan and Vision 2030 (2013).
- Managed project for the Department of Environmental Affairs and Tourism, Marine & Coastal Management to determine the cost implications associated with the implementation of the Integrated Coastal Management Act (2007).
- Managed project to develop a Conservation Plan and Municipal Open Space System (MOSS) for Buffalo City Municipality (2007).
- Managed project to develop a Sanitation Policy and Strategy for Buffalo City Municipality, Eastern Cape (2004 – 2006).
- Managed project to develop an Integrated Environmental Management Plan and Integrated Coastal Zone Management Plan for Buffalo City Municipality, Eastern Cape (2004 – 2005).
- Managed projects to develop and implement an Environmental Management System (EMS) for the Chris Hani and Joe Gqabi (formerly Ukhahlamba) District Municipalities in the Eastern Cape generally in line with ISO14001 EMS standards (2004 – 2005).
- Managed project to develop a State of the Environment Report and Environmental Implementation Plans for Amathole, Chris Hani, OR Tambo and Joe Gqabi District Municipalities in the Eastern Cape Province (2005 – 20010).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).

Environmental & Social Management Systems



ALAN ROBERT CARTER

Curriculum Vitae



PUBLICATIONS

- Managed project to develop Environmental & Social Management Systems (ESMS) in line with IFC Performance Standards for an agricultural equipment supplier in Malawi on behalf of Norfund (2021).
- Managed projects to develop Environmental Management Systems (EMS) in line with ISO14001 EMS Standard for a South African water utility (2019).
- Managed projects to develop Environmental & Social Management Systems (ESMS) in line with IFC Performance Standards for four (4) wind farms in South Africa (2015-2018).
- Managed project to develop an Environmental & Social Management System (ESMS) in line with IFC Performance Standards for a telecoms company in Zimbabwe on behalf of the German Development Bank (2013).
- Conducted Environmental Management System (EMS) reviews for a number of large US corporations, including Gulfstream Aerospace Corporation.

Public financial accounting

- While with Ernst & Young LLP, (USA), functioned as lead financial auditor for various public and private companies, mostly in the technology business segment of up to \$200 million in annual sales. Client experience included assistance in a \$100 million debt offering, a \$100 million IPO and SEC annual and quarterly reporting requirements.
- Completed three years of articles (training contract) in fulfilment of the certification requirements of the South African Institute of Chartered Accountants which included auditing, accounting and preparation of tax returns for many small to medium sized commercial entities.

Refereed Publications

- Carter, A.R. 1985. Reproductive morphology and phenology, and culture studies of *Gelidium pristoides* (Rhodophyta) from Port Alfred in South Africa. *Botanica Marina* 28: 303-311.
- Carter, A.R. 1993. Chromosome observations relating to bipore production in *Gelidium pristoides* (Gelidiales, Rhodophyta). *Botanica Marina* 36: 253-256.
- Carter, A.R. and R.J. Anderson. 1985. Regrowth after experimental harvesting of the agarophyte *Gelidium pristoides* (Gelidiales: Rhodophyta) in the eastern Cape Province. *South African Journal of Marine Science* 3: 111-118.
- Carter, A.R. and R.J. Anderson. 1986. Seasonal growth and agar contents in *Gelidium pristoides* (Gelidiales, Rhodophyta) from Port Alfred, South Africa. *Botanica Marina* 29: 117-123.
- Carter, A.R. and R.H. Simons. 1987. Regrowth and production capacity of *Gelidium pristoides* (Gelidiales, Rhodophyta) under various harvesting regimes at Port Alfred, South Africa. *Botanica Marina* 30: 227-231.
- Carter, A.R. and R.J. Anderson. 1991. Biological and physical factors controlling the spatial distribution of the intertidal alga *Gelidium pristoides* in the eastern Cape Province, South Africa. *Journal of the Marine Biological Association of the United Kingdom* 71: 555-568.

Published reports

- Water Research Commission. 2006. Profiling Estuary Management in Integrated Development Planning in South Africa with Particular Reference to the Eastern Cape. Project No. K5/1485.
- Turpie J., N. Sihlophe, A. Carter, T. Maswime and S. Hosking. 2006. Maximising the socio-economic benefits of estuaries through integrated planning and management: A



ALAN ROBERT CARTER

Curriculum Vitae



rationale and protocol for incorporating and enhancing estuary values in planning and management. Un-published Water Research Commission Report No. K5/1485

Conference Proceedings

- Carter, A.R. 2002. Climate change and emission inventories in South Africa. Invited plenary paper at the 5th International System Auditors Convention, Pretoria. Held under the auspices of the South African Auditor & Training Certification Association Conference (SAATCA).
- Carter, A.R. 2003. Accounting for environmental closure costs and remediation liabilities in the South African mining industry. Proceedings of the Mining and Sustainable Development Conference. Chamber of Mines of South Africa, Vol. 2: 6B1-5
- Carter, A.R. and S. Fergus. 2004. Sustainability analysis of wastewater treatment options on the West Bank of East London, Buffalo City. Proceedings of the Annual National Conference of the International Association for Impact Assessment, South African Affiliate: Pages 295-301.
- Carter, A., L. Greyling, M. Parramon and K. Whittington-Jones. 2007. A methodology for assessing the risk of incurring environmental costs associated with port activities. Proceedings of the 1st Global Conference of the Environmental Management Accounting Network.
- Hawley, GL, AR McMaster and AR Carter. 2009. Carbon, carbon stock and life-cycle assessment in assessing cumulative climate change impacts in the environmental impact process. Proceedings of the Annual National Conference of the International Association for Impact Assessment, South African Affiliate.
- Hawley, GL, AR McMaster and AR Carter. 2010. The Environmental and Social Impact Assessment and associated issues and challenges. African, Caribbean and Pacific Group of States (ACP), Science and Technology Programme, Sustainable Crop Biofuels in Africa.
- Carter, AR. 2011. A case study in the use of Life Cycle Assessment (LCA) in the assessment of greenhouse gas impacts and emissions in biofuel projects. 2nd Environmental Management Accounting Network- Africa Conference on Sustainability Accounting for Emerging Economies. Abstracts: Pages 69-70.

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

ALAN ROBERT CARTER

Date: March 2022



GREGORY SHAW

Curriculum Vitae



CONTACT DETAILS

Name of Company	CES
Designation	Grahamstown Branch
Profession	Principal Environmental Consultant
Years with firm	3 Years
E-mail	g.shaw@csetnet.co.za
Office number	+27 (0)46 622 2364
Nationality	South African
Professional Body	SACNASP, South African Council for Natural Scientific Profession, Professional (Pending)
Key areas of expertise	<ul style="list-style-type: none"> ➤ Marine Ecology ➤ Environmental and Social Impact Assessment (ESIA) ➤ Environmental Management and Monitoring ➤ Project Management

PROFILE

Mr Gregory Shaw

Greg is a principal environmental consultant with more than 10 years' experience, who has carried out ESIA's for a variety of infrastructure developments in Africa and Europe. His experience is with development projects where there is creation or modification of infrastructure, via capital works and complex logistics.

He is able to engage with the full portfolio of diverse stakeholder groups and regulators via meetings, written material, face-to-face workshops, presentation events, negotiation and discussion to achieve mutually agreeable mitigation measures and solutions. As part of many of the ESIA's he has been involved in or managed he has been responsible for the development and execution of environmental surveys (and subsequent monitoring programmes), sub-contractor management (including contracting), report writing and project management. In addition, he has been responsible for developing and auditing plans associated with managing large infrastructure projects e.g. Environmental Management Plans (EMP).

Greg forms strong relationships and ensure that the team works together in an integrated way towards the clear common goal, making effective use of time and resources.



GREGORY SHAW

Curriculum Vitae



EMPLOYMENT EXPERIENCE

November 2016 - Present:
Principal Consultant (EOH Coastal & Environmental Services)
Grahamstown, South Africa

January 2008 – October 2016:
Senior Consultant (Royal HaskoningDHV)
Peterborough, United Kingdom

January 2004 – January 2007:
Part-time consultant (Public Process Consultants)
Port Elizabeth, South Africa

ACADEMIC QUALIFICATIONS

Nelson Mandela Metropolitan University, Port Elizabeth
MSc (Botany)
2005 – 2007

Nelson Mandela Metropolitan University, Port Elizabeth
BSc (Hons) (Environmental Management)
2004

University of Port Elizabeth, Port Elizabeth
BSc (Natural Sciences)
2000 - 2003

COURSES

- 2013 Royal HaskoningDHV Accelerated Development Programme
- 2012 First Aid
- 2012 Handling Conflict
- 2011 Client Relationships
- 2011 Financial Management
- 2010 Report Writing
- 2010 Project Management
- 2010 Effective Communication
- 2010 Knowing Your Business
- 2010 Phase I Ecological Surveying Techniques and Taxonomy
- 2009 CIWEM Structured Training
- 2009 Project Management
- 2008 Sustainable Construction
- 2006 South African Association of Botanists - Annual Seminar
- 2005 Resource Directed Measures
- 2005 Training in Integrated Environmental Management
- 2005 Integrated Water Resource Management Workshop

CONSULTING EXPERIENCE

Environmental consulting experience as project manager or team member is broad and covers a number of key industry sectors (ports, nuclear, renewable energy). The majority of the international ESIs were conducted in accordance with international standards including the IFC Performance Standards and have been reviewed by international Development Finance Institutions.



GREGORY SHAW

Curriculum Vitae



South Africa

- Nirove Paint Stripping Facility [Project manager]
- Wison Coal to Urea EIA [Project manager]
- St Francis Bay EIA [Project Manager, Marine specialist]
- EOH Powerstation Feasibility Assessment [Project manager]
- Richard's Bay breakwater refurbishment [Marine specialist]
- KBK Engineers (Sanral) Basic Assessment [Project manager]
- Bayview Wind Energy Facility [Project director]
- Rushmere Noach Attorneys [Project manager and marine specialist]
- TNPA East London Quay 3 Assessment [Environmental specialist]
- TNPA Ballast Water Management Plan [Environmental specialist]
- Fairwood Estate Environmental Authorisation [ESMP author]
- Environmental Scoping Report cc. Erf 2387, Port Elizabeth. Baobab Agencies. [Environmental specialist].
- Proposed Hybrid Residential Development Scoping Report, Port Elizabeth. [Environmental specialist].
- Ingleside Development, Port Elizabeth. [Specialist Review].
- Port of Ngqura Marine Biomonitoring Programme. Coega Development Corporation. [Surveyor / research assistant].
- Construction and Operation of the Deepwater Port of Ngqura EIA. Coega Development Corporation. [Specialist review].

Africa

- Kenmare Mangrove Baseline Assessment (Mozambique) [Lead surveyor]
- Sphinx Energy Solar PV Facilities in Guider & Maroua (Cameroon) [Project manager]
- Olam Cocoa Plantation ESIA (Tanzania) [Project manager, ESIA manager]
- MCA-Malawi RAP Audit [Project Manager, Lead Auditor]
- JCM Power ESMS [Project manager]
- JCM Power Solar Power Station ESIA [Project Manager, Report Author]
- Suni Resources Traffic Impact Assessment [Report author]
- NCCL Isanye Dam EPB (Zambia) [Project manager]
- NCCL Ngoli Dam EPB (Zambia) [Project manager]
- NCCL Kasama Dam ESIA (Zambia) [ESIA manager]
- JCM Power Solar PV ESIA (Cameroon) [ESIA manager]
- Tete Iron Ore Project ESIA (Mozambique) [ESMP]
- Triton Ancuabe ESIA (Mozambique) [Specialist coordination, ESMP]
- Badagry Greenfield Port Development ESIA including management plans (Nigeria) [ESIA and marine specialist]
- Saly Coastal Protection Project ESIA (Senegal) [Marine specialist]
- Port Mole Waterfront Development ESIA including management plans (Gabon) [ESIA manager and marine specialist]
- Bulk Handling Facility ESIA including management plans (Conakry Guinea) [ESIA manager and marine specialist]
- Kamsar Container Terminal ESIA including management plans (Conakry Guinea) [ESIA manager and marine specialist]



GREGORY SHAW

Curriculum Vitae



- Port of Ziguinchor ESIA including management plans (Senegal) [Marine specialist / Reviewer]
- Eko Atlantic Shoreline Protection ESIA including management plans (Nigeria) [Marine specialist]
- Eko Atlantic Topside Infrastructure ESIA (Nigeria) [ESIA manager]
- Construction of a Jetty Facilitating Transfer of Petroleum Products from Ship to Shore (Eritrea) [Environmental Clerk of Works]

United Kingdom

- Thamesport Phase IV Quay Extension EIA [Reviewer]
- East Lane, Bawdsey Coast Defence Works [Environmental Clerk of Works]
- Kilkeel Offshore Wind Farm Feasibility and Scoping Report [Project manager]
- Wells Channel Deepening and Jetty Construction EIA [EIA and marine specialist]
- Wells Channel Deepening and Jetty Construction Environmental Monitoring Programme (2010-2016) [Project manager and marine specialist]
- Trinity III Enhancement Monitoring Programme (2008 – 2011) [Marine specialist]
- Trimley Ecological Monitoring Programme (2008 – 2011) [Marine specialist]
- SEAs for the Eastern England Shoreline, required for Shoreline Management Plans [Marine specialist]
- River Habitat Survey, Tributary of Car Dyke [Field work and report writing]
- Hinkley Point C Environmental Impact Assessment [EIA coordinator and marine specialist]
- Harwich Haven Annual Environmental Reporting (2009 – 2011) [Project manager and marine specialist]
- Environmental Monitoring and Mitigation Plan / Habitat Regulations Assessment East Lane [Project manager and marine specialist]
- Thanet Offshore Wind Farm [Environment Manager]
- The Wash Tide Gauge [Consent advisor and marine specialist]
- Dogger Bank Croyke Beck A&B, Teesside A&B EIA [Marine specialist]
- Kentish Flats Offshore Wind Farm Extension [Consent advisor / environment manager]
- Royal National Lifeboat Institute (RNLI) Feasibility [Project manager and marine specialist]
- Bacton Gas Terminal Coast Protection Works and Offshore Borrow Area EIA [Consent and marine specialist]
- Newhaven East Quay and Port Expansion Area EIA [Marine specialist]
- Sizewell C New Nuclear Build Habitats Regulations Assessment [Project manager]
- DNV Subsea Cable Installation Guidelines [Marine and Consenting expert]



GREGORY SHAW
Curriculum Vitae



CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

GREGORY SHAW

Date: January 2020



Alain du Plessis

Curriculum Vitae

CONTACT DETAILS

Name of Current Company	Coastal and Environmental Services (Pty) Ltd trading as CES
Designation	Port Elizabeth Branch
Profession	Environmental Consultant
Years of Experience	8 years (2014-Present)
Years with current firm	2
E-mail	a.duplessis@cesnet.co.za
Office number	+27 (0)41 045 0496
Nationality	South African
Drivers Licence	Valid South African Drivers Licence Code B
Key areas of expertise	<ul style="list-style-type: none"> ➤ Environmental Auditing/Compliance Monitoring ➤ Environmental Management Plans ➤ Environmental Impact Assessments ➤ Aquatic Ecology and Waste Management

PROFILE

Mr Alain du Plessis

Alain holds a BSc (Honours) post graduate degree in Environmental Sciences from Rhodes University and a BSc degree in Environmental and Geographical Science and Oceanography and Atmospheric Sciences from the University of Cape Town (UCT). He is also a registered member of the International Association for Impact Assessment South Africa (IAIASa). Alain has five (5) years' experience in environmental consulting, including environmental compliance monitoring, and was appointed by CES in 2020. Among the various local projects Alain has been appointed as Environmental Control Officer (ECO) for was the re-graveling and maintenance of gravels roads in the Central Karoo and Eden District Municipalities. The project also entailed the rehabilitation and active seeding of borrow pits DR1721/16.15/0.02R (Klaarstroom), DR1445/17.15/0.01R (Laingsburg), and MR374/24.5/0.05R (Laingsburg).

EMPLOYMENT EXPERIENCE

CES, Environmental Consultant (2020-Current)

Legacy (EMC) Environmental Management Consulting (2018 – 2020)

Aurecon, Environmental Scientist (2015-2017)

Sea-Harvest, Environmental Intern (2014/2015)

Aurecon, Junior Consultant (2014)



Alain du Plessis

Curriculum Vitae

ACADEMIC QUALIFICATIONS

Rhodes University, Grahamstown
BSc Honours (Post Graduate Degree) in Environmental Sciences
2013

University of Cape Town (UCT), Cape Town
BSc Environmental and Geographical Science
2009 – 2012
BSc Oceanography and Atmospheric Science
2009-2012

CONSULTING EXPERIENCE

Sea Harvest Factory Saldanha Bay (Western Cape, South Africa) – Environmental Intern
08/2014 - 01/2015

The projects involved daily monitoring of water use and waste productions throughout the production factory. The water consumption information was then used to reduce water consumption through maintenance and repair of leaking pipes and taps on the factory floor. All these precautions decreased water use while maintaining a good level of production. Furthermore, waste production was to be monitored in order to decrease the carbon footprint for the plant. Waste was separated in the scrap yard where specialized waste could be resold or reused which not only contributed to a smaller carbon footprint but also provided an additional revenue for the company.

Ysterburg pumping station site closure report (Western Cape Province, South Africa) – ECO
02/2015 - 02/2015

The project entailed conducting a site audit and compiling an audit report form as part of the environmental management plan (EMP) required for the Ysterburg pump station upgrades in Paarl, Western Cape. Responsible for site closure inspections, conducting site audits and compiling an audit report. Involved for 0.5 person-months (Drakenstein Local Municipality).

Klipdam Environmental Management Plan (EMPr) HDPE pipeline in Paarl (Western Cape Province, South Africa) - Project Member
02/2015 - 11/2015.

The project involved the replacement of existing asbestos water pipes with high-density polyethylene (HDPE) pipeline to help meet the increasing demand for water in the region. Responsible for compiling an environmental management plan. Involved for 0.75 person-months (Drakenstein Local Municipality).

Working for Wetlands plan 2014 - 2017 (Western Cape Province, South Africa) - Project Member
06/2013 - 12/2015



Alain du Plessis

Curriculum Vitae

Aurecon was appointed in 2010 for a three-year cycle for the design, planning, environmental, project and risk management of the South African Government's Working for Wetlands Programme, which is a nationally run initiative by the South African National Biodiversity Institute (SANBI). Responsible for liaising with relevant authorities as part of the public participation process (PPP) printing and compiling of reports. Involved for 0.5 person-months (South African National Biodiversity Institute (SANBI)).

Western Cape Provincial road materials supply strategy (Western Cape Province, South Africa) - Project Member
06/2008 - 03/2015

The Western Cape Province initiated a proactive approach to identifying and legalising a network of approved pits. Aurecon was responsible for prospecting suitable road making materials, sampling, testing, and identifying technically suitable sources to be used for both identified projects and as strategic pits. Also responsible for getting all the required approvals. Responsible for the public participation process (PPP), liaising and briefing authorities, libraries and municipalities about project details as well as the proposed pits in the area. Also responsible for the compilation of environmental management programmes (EMPrs) and for the MR&PDA process, and basic assessment reports (BARs) for the NEMA process (Western Cape Provincial Government Department of Transport and Public Works).

Materials supply for gravel roads (Western Cape Province, South Africa) - Project Member, Junior ECO
02/2015 - 02/2020

Aurecon has been appointed to assist with the material supply and planning, design and control aspects for the maintenance of gravel roads in the Central Karoo and Eden District Municipalities. The contract primarily entails locating and proving suitable material sources for the re-gravelling of 300 km and maintenance activities of 45 000 km of all gravel roads in the two identified district municipalities. Aurecon was also tasked to oversee the rehabilitation and conducting active seeding of borrow pits DR1721/16.15/0.02R (Klaarstroom), DR1445/17.15/0.01R (Laingsburg) and MR374/24.5/0.05R (Laingsburg). Responsible for conducting monthly site visits and compilation of environmental control officer (ECO) reports. Also responsible for compilation of training programme for site personnel. Also responsible for rehabilitation auditing and reseedling of the three mentioned borrow pits, as recommended by botanical specialist. Involved for 10 person-months. (Provincial Government of the Western Cape (PGWC): Department of Transport and Public Works (DTPW)). Other pits include MR374/29.9/0.05R, MR374/2.4/0.03R, OP7042/3.5/0.05R, and MR318/16.3/1.3L.

Nettleton House: environmental control officer (ECO) (Western Cape Province, South Africa) – ECO
01/2012 - 04/2017

The project involved ensuring adherence to the provisions of the Nettleton House environmental management plan (EMP) as well as relevant conditions of approval. Responsible for conducting monthly site visits and compilation ECO reports.



Alain du Plessis

Curriculum Vitae

Woolworths distribution centre in Montague Gardens (Western Cape Province, South Africa) – ECO
11/2014 - 10/2017

Woolworths bought a 16 ha Telkom site in Montague Gardens with the aim of constructing a new distribution centre on the site. Aurecon was engaged to provide consulting engineering services on the project, including civil, structural, traffic engineering and environmental management services. Demolition works of the existing infrastructure commenced in February 2016 and construction commenced in August 2016. Responsible for conducting monthly site visits and compilation of ECO reports environmental advisory services for the duration of the site preparation and construction of the distribution centre. (Woolworths (Pty) Ltd).

ECO services for Greenville housing development project (Western Cape Province, South Africa) – ECO
02/2014 - 12/2015

Aurecon was appointed to undertake the role of ECO during the construction phase, compile a conservation management plan and provide education programme services for the Greenville housing development project in Fisantekraal. Responsible for ECO report write ups and site inspections and acting as environmental advisory. (Garden City).

ECO services for the construction of a treated effluent HDPE-lined reservoir in Parow (Western Cape) – ECO
03/2016-9/2016

Responsible for environmental monitoring and audit reporting for the construction of a treated effluent HDPE-lined reservoir in Parow (City of Cape Town).

ECO services for the reconstruction & maintenance management plan for flood damaged road – ECO
09/2016-11/2018

Responsible for environmental monitoring and audit reporting for the reconstruction & maintenance management plan for flood damaged road infrastructure (Laingsburg local municipality).

ECO services for the capacity extension and associated infrastructure refurbishment of Zandvliet wastewater treatment works (Western Cape) – ECO
12/2015-2018

Responsible for environmental monitoring and audit reporting for the capacity upgrade of the Black-mac effluent pipeline and refurbishment of the Macassar pump station (City of Cape Town).

ECO services for the development of Ngcobo wastewater treatment works (WWTW) and associated infrastructure (Eastern Cape) – ECO
10/2020-Current



Alain du Plessis

Curriculum Vitae

Responsible for environmental monitoring and audit reporting development of Ngcobo (WWTW).

ECO services for the development of the upgrade and construct approximately 48 km of roads of from Thornhill to the R344, via the Tsolwana Nature Reserve– ECO 10/2020-Current

Responsible for environmental monitoring and audit reporting development of the proposing to upgrade and construct the of roads of from Thornhill to the R344, via the Tsolwana Nature Reserve near Tarkastad in the Eastern Cape Province.

ECO services for independent Environmental Management Services (EMS) for the proposed Nxuba Wind Farm located near Cookhouse in the Eastern Cape Province. – ECO

11/2020-05/2021

permanent onsite position and responsible for day-to-day monitoring of construction activities in order to ensure compliance with EMP, relevant permits and environmental authorisations.

ECO services for the access road upgrade from R61 to Hluleka Nature Reserve, Nyandeni Local Municipality Eastern Cape. – ECO 03/2021-Current

Responsible for environmental monitoring and audit reporting development of the proposing to upgrade and construct the of roads of from Hluleka Road to the R61 in the Eastern Cape Province.

ECO services for Kentani Road off the N2 to Kentani from Butterworth, Mnguma Local Municipality Eastern Cape. 05/2021-Current

Responsible for environmental monitoring and audit reporting development of the proposing to upgrade and construct the of roads of from the N2 approaching Butterworth to Centani via Kentani Road in the Eastern Cape Province.

ECO and ISO14001 Services to Tsitsikamma Community Wind Energy Facility and Amakhala Emoyeni Wind Energy Facility, Eastern Cape. 03/2021 - Current

Responsible for conduction Environmental Audit inspection to ISO14001 standards, to monitor compliance and report on the maintenance and operation of said facilities.

ECO services for the access road upgrade from R63 to Alice from Fort Beaufort, Raymond Mhlaba Local Municipality Eastern Cape. – ECO

Responsible for environmental monitoring and audit reporting development of the proposing to upgrade and construct the of roads of from Fort Beaufort to Alice along the R63 in the Eastern Cape Province.



Alain du Plessis

Curriculum Vitae

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

Alain du Plessis

Date: March 2022



12 ANNEXURE 4: SITE SENSITIVITY MAP

Tower 1 (GRO/ORa 270) is where the line will deviate from the existing line and has already been constructed. The sensitivity at this site was determined to be high. Since this tower already exists, there will be no anticipated impacts at this site and no further assessment was undertaken.

Towers 2 (GRO/ORa 271), 3 (400kV Gantry 2) and 4 (Obib 1 Gantry) all occur within degraded areas that are mostly transformed. The sensitivity at these sites was determined to be low. Impacts associated with the location of these towers were of moderate to low significance.

Tower 5 (Border/ORa 005) was determined to be of moderate sensitivity based on species assemblages and some degradation that has already occurred at this site. Impacts associated with the location of this tower were predominantly of moderate to low significance.

Tower 6 (Border/ORa 004) has been assigned a high sensitivity due to it having a low receptor resilience, good habitat connectivity with limited disturbance and its likelihood to support SCC. It must be noted that although not recorded at the tower itself, Sensitive Species 542 was recorded within 50-100m of the tower position. This species is Critically Endangered with an Extent of Occupancy of <10km². The area where this population is located is considered to be of very high sensitivity and as such must be cordoned off and managed as a no-go area.

Tower 7 (Border/ORa 003) has been assigned a Very High sensitivity due to the presence of a vulnerable species (*Astridia velutina*), the high diversity of species present on the rocky outcrop, the low rehabilitation potential of this habitat and the low likelihood of the current species returning to the site after the disturbance. The tower is shifted 30m west to the alternative site that was surveyed, this now has a lower sensitivity from very high to high which is preferable (Figure 2). The alternative site is a better option as the conservation importance is lower than at the current site and the receptor resilience is slightly higher.

Tower 8 (Border/ORa 002) It should be noted that the proposed OHPL traverses the Orange River in the same portion as that assessed by BlueScience (2016): Construction activities should as far as possible occur outside of the delineated aquatic features and the proposed buffer zones. These areas should be marked as no-go areas prior to construction. The recommended buffers for the Orange River at the proposed crossing vary between 30m and more than 100m depending on the slope and sensitivity of the banks within the study area.

Neither the pylons, their anchors, nor the access roads to the pylons should be placed within the river channel, riparian zone or the recommended buffer zones. The overhead powerlines may however cross over the buffer zones and the river. Therefore it is of the opinion of the freshwater specialist that the proposed OHPL layout will not pose a direct negative impact on the Orange River.

Tower 9 (Border/ORa 001) based on the understanding of the area and the nature of the installation it is anticipated that the sensitivity, based on species assemblages and some degradation, will be predominantly of moderate to low significance.







Signed with Impression - Chain of Custody



Signature Request

Signature Request ID:	59642ad5-25f5-4dc8-b5a2-a65a1971cb6d	Timestamp:	2022-11-14 15:11:32 GMT
Signee Name:	Dr. Alan Carter	Sender Name:	Lynn Smit
Request Type:	WebSigning	Request Status:	WEBVIEWER SIGNED

Original Document

Document Name:	APPENDIX 4_CEMPr.pdf	Document Size:	2.9 MB
----------------	----------------------	----------------	--------

Email Evidence

Signee Email:	a.carter@cesnet.co.za	Email Subject:	A document from Lynn Smit is ready for signature
Email Sent Timestamp:	2022-11-14T14:33:28.863337	Email Opened Timestamp:	Not available in Silent Mode

Web Evidence

Signee IP Address:	92.158.242.91	Request Timestamp:	2022-11-14 15:05:40 GMT
Signee GPS (if shared):	FR: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/107.0.0.0 Safari/537.36	Terms Accepted Timestamp:	2022-11-14 15:05:46 GMT

Annotations and Modifications

Signature Count:	1	Form Fields Filled Count:	0
Text Annotation Count:	0	Initial All Pages Count:	0
Single Initial Count:	0		

Signing Evidence

Signee Mobile:	+27833799861	Sign Type:	WebSigning
Security Challenge:	NONE	Part of Workflow:	0ee66464-c579-4cec-a5f3-13c20e7f45ee

Chain Of Custody Generation

Attached Document Name:	20221114T151132.435962Z APPENDIX 4_CEMPr.pdf	Attached Timestamp:	2022-11-14 15:11:32 GMT
-------------------------	--	---------------------	-------------------------

