environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

The proposed construction of the Ferrum-Garona and Garona Niewehoop 4kV Lilo route and expansion of the Garona Substation for Project DAO near Groblershoop, !Kheis Local Municipality, Northern Cape Province

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

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Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
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Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	Cultural Heritage Consultant			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	0
Specialist name:	J A van Schalkwyk			
Specialist Qualifications:	D. Litt et Phil			
Professional affiliation/registration:	Association of Southern African Professional Archaeologists, No. 164			
Physical address:	62 Coetzer Avenue, Monument Park, Pretoria, 0181			
Postal address:	62 Coetzer Avenue, Monument Park, Pretoria			
Postal code:	0181	Cell:	076 790 6999	
Telephone:	-	Fax:	-	
E-mail:	jvschalkwyk@mweb.co.za			

2. DECLARATION BY THE SPECIALIST

I, J A van Schalkwyk, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

n/a

Name of Company:

5 July 2021

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, J A van Schalkwyk, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

n/a

Name of Company

5 July 2021

Date

Signature of the Commissioner of Oaths

2021/07/05

Date

SUID-AFRIKAANSE POLISIEDIENS
SAPS LYTTELTON ,
2021 -07- 05
COMMUNITY SERVICE CENTRE
SOUTH AFRICAN POLICE SERVICE

Phase 1 Cultural Heritage Impact Assessment:

THE PROPOSED CONSTRUCTION OF THE FERRUM – GARONA AND GARONA – NIEWEHOOP 400KV LILO ROUTE AND EXPANSION OF THE GARONA SUBSTATION FOR PROJECT DAO NEAR GROBLERSHOOP, !KHEIS LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

Prepared for:

ACWA Power: Ms L Mdali

- Postal Address: 7th Floor, 90 Grayston Drive, Sandton, 2196; Tel: 011 722 4100; E-mail: lmdali@acwapower.com

Prepared by:

J A van Schalkwyk (D Litt et Phil),

- Heritage Consultant: ASAPA Registration No.: 164 - Principal Investigator: Iron Age, Colonial Period, Industrial Heritage.
- Postal Address: 62 Coetzer Avenue, Monument Park, 0181; Tel: 076 790 6777; E-mail: jvschalkwyk@mweb.co.za

Report No: 2021/JvS/050

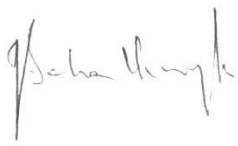
- Status: Final
- Date: June 2021
- Revision No: -
- Date: -

Submission of the report:

It remains the responsibility of the client to submit the report to the South African Heritage Resources Agency (SAHRA) or relevant Provincial Heritage Resources Agency (PHRA) by means of the online SAHRIS System.

Specialist competency:

Johan A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 40 years. Originally based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape Province, Northern Cape Province, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. Based on this work, he has curated various exhibitions at different museums and has published more than 70 papers, most in scientifically accredited journals. During this period, he has done more than 2000 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, roads, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.



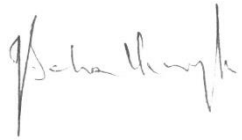
J A van Schalkwyk
Heritage Consultant
June 2021

SPECIALIST DECLARATION

I, J A van Schalkwyk, as the appointed independent specialist, in terms of the 2014 EIA Regulations (as amended), hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 (as amended) and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist



J A van Schalkwyk
June 2021

EXECUTIVE SUMMARY

Phase 1 Cultural Heritage Impact Assessment:
THE PROPOSED CONSTRUCTION OF THE FERRUM – GARONA AND GARONA – NIEWEHOOP 400KV LILO ROUTE AND EXPANSION OF THE GARONA SUBSTATION FOR PROJECT DAO NEAR GROBLERSHOOP, !KHEIS LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

Royal Haskoning DHV was appointed as independent environmental consultant to undertake the Basic Assessment Process for the construction of the Ferrum – Garona and Garona – Niewehoop 400kV loop in loop out route and expansion of the Garona Substation for Project DAO (formerly Bokpoort Solar Photovoltaic (PV) Energy Facility) near Groblershoop, !Kheis Local Municipality, Northern Cape Province.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by *ACWA Power* to conduct a cultural heritage assessment to determine if the construction of the power line and expansion of the existing Garona Substation would have an impact on any sites, features or objects of cultural heritage significance.

This report describes the methodology used, the limitations encountered, the heritage features that were identified and the recommendations and mitigation measures proposed relevant to this. The HIA consisted of a desktop study (archival sources, database survey, maps and aerial imagery) and a physical survey that included the interviewing of relevant people. It should be noted that the implementation of the mitigation measures is subject to SAHRA/PHRA's approval.

Identified sites

During the survey no sites, features or objects of cultural heritage significance was identified to occur in the project area.

Impact assessment and proposed mitigation measures

Impact analysis of cultural heritage resources under threat of the proposed development, is based on the present understanding of the development:

- For the current study, as no sites, features or objects of cultural significance were identified, no mitigation measures are proposed.

Legal requirements

The legal requirements related to heritage specifically are specified in Section 3 of this report.

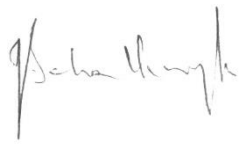
- For this proposed project, the assessment has determined that no sites, features or objects of cultural heritage significance occur in the project area, therefore no permits are required from SAHRA or the PHRA.
- If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view, it is recommended that the proposed activities be allowed to continue on acceptance of the proposed mitigation measures and the conditions proposed below.

Conditions for inclusion in the environmental authorisation:

- The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that the project area has a moderate sensitivity of fossil remains to be found and therefore a palaeontological desktop assessment is required.
- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. The appropriate steps to take are indicated in Section 9 of the report, as well as in the **Management Plan: Burial Grounds and Graves, with reference to general heritage sites**, in the Addendum, Section 12.4.



J A van Schalkwyk
Heritage Consultant
June 2021

TECHNICAL SUMMARY

Project description	
Description	Construction of a 400kV LiLo Power Line and expansions at Garona Substation
Project name	Garona 400kV LILO

Applicant

Environmental assessors
Ms L Mdali
ACWA Power

Property details						
Province	Northern Cape					
Magisterial district	Gordonia					
District municipality	!Kheis					
Topo-cadastral map	2821DB & 2822CA					
Farm name	Bokpoort					
Closest town	Groblershoop					
Coordinates	Centre point (approximate)					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	S 28,73616	E 22,00132	2		
	.kml files[1]					

Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq m	Yes
Development involving three or more existing erven or subdivisions	No
Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 sq m	No
Any other development category, public open space, squares, parks, recreation grounds	No

Land use	
Previous land use	Farming
Current land use	Farming/PV Power Plant

[1] Left click on the icon to open the file in Google Earth, if installed on the computer. Alternatively, right click on the icon. In dialog box, select "Save Embedded File to Disk" and save to folder of choice.

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GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Bioturbation: The burrowing by small mammals, insects and termites that disturb archaeological deposits.

Cumulative impacts: "Cumulative Impact", in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

Debitage: Stone chips discarded during the manufacture of stone tools.

Factory site: A specialised archaeological site where a specific set of technological activities has taken place – usually used to describe a place where stone tools were made.

Historic Period: Since the arrival of the white settlers - c. AD 1830 - in this part of the country.

Holocene: The most recent time period, which commenced c. 10 000 years ago.

Iron Age (also referred to as **Early Farming Communities**)**:** Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. As they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Later Iron Age	AD 1300 - AD 1830

Midden: The accumulated debris resulting from human occupation of a site.

Mitigation, means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

National Estate: The collective heritage assets of the Nation.

Pleistocene: Geological time period of 3 000 000 to 20 000 years ago.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 500 000 - 250 000 Before Present
Middle Stone Age	250 000 - 40 000 - 25 000 BP
Later Stone Age	40-25 000 - until c. AD 200

Tradition: As used in archaeology, it is a seriated sequence of artefact assemblages, particularly ceramics.

ACRONYMS and ABBREVIATIONS

AD	Anno Domini (the year 0)
ASAPA	Association of Southern African Professional Archaeologists

BC	Before the Birth of Christ (the year 0)
BCE	Before the Common Era (the year 0)
BP	Before Present (calculated from 1950 when radio-carbon dating was established)
CE	Common Era (the year 0)
CRM	Cultural Resources Management
CS-G	Chief Surveyor-General
EAP	Environmental Assessment Practitioner
EIA	Early Iron Age
ESA	Early Stone Age
HIA	Heritage Impact Assessment
I & AP's	Interested and Affected Parties
ICOMOS	International Council on Monuments and Sites
LIA	Late Iron Age
LSA	Later Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
WUL	Water Use Licence

COMPLIANCE WITH APPENDIX 6 OF THE 2014 EIA REGULATIONS (AS AMENDED)

Requirements of Appendix 6 – GN R982	**Addressed in the Specialist Report**
1. (1) A specialist report prepared in terms of these Regulations must contain-	
a) details of-	
i. the specialist who prepared the report; and	Front page
ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Page i Addendum Section 6
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1
(cA) an indication of the quality and age of base data used for the specialist report;	Section 4
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 7
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 4.2.2
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 4
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 7; Figure 13
g) an identification of any areas to be avoided, including buffers;	Section 8
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figure 13 Section 7
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 7
k) any mitigation measures for inclusion in the EMPr;	Section 8 & 10
l) any conditions for inclusion in the environmental authorisation;	Section 10
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 9
n) a reasoned opinion-	
i. whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and	Section 10
ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 8, 10
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	-
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	-
q) any other information requested by the competent authority.	-
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	-

Phase 1 Cultural Heritage Impact Assessment:
THE PROPOSED CONSTRUCTION OF THE FERRUM – GARONA AND GARONA – NIEWEHOOP 400KV LILO ROUTE AND EXPANSION OF THE GARONA SUBSTATION FOR PROJECT DAO NEAR GROBLERSHOOP, !KHEIS LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

1. INTRODUCTION

1.1 Background

Royal Haskonning DHV was appointed as independent environmental consultant to undertake the Basic Assessment Process for the construction of the Ferrum – Garona and Garona – Niewehoop 400kV loop in loop out route and expansion of the Garona Substation for Project DAO (formerly Bokpoort Solar Photovoltaic (PV) Energy Facility) near Groblershoop, !Kheis Local Municipality, Northern Cape Province.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. However, according to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by *ACWA Power* to conduct a cultural heritage assessment to determine if the construction of the power line and expansion of the existing Garona Substation would have an impact on any sites, features or objects of cultural heritage significance.

This report forms part of the Basic Assessment (BA) process as required by the EIA Regulations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and is intended for submission to the South African Heritage Resources Agency (SAHRA).

1.2 Terms and references

The aim of a full HIA investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to identify heritage resources (involving site inspections, existing heritage data and additional heritage specialists if necessary); assess their significances; assess alternatives in order to promote heritage conservation issues; and to assess the acceptability of the proposed development from a heritage perspective.

The result of this investigation is a heritage impact assessment report indicating the presence/ absence of heritage resources and how to manage them in the context of the proposed development.

Depending on SAHRA's acceptance of this report, the developer will receive permission to proceed with the proposed development, on condition of successful implementation of proposed mitigation measures.

1.2.1 *Scope of work*

The aim of this study is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where the construction of the power line and expansion of the existing Garona Substation is to take place. This included:

- Conducting a desk-top investigation of the project area;
- A visit to the proposed project area.

The project area includes the following properties:

- Remainder Extent, Portion 4, Portion 5 and Portion 9 of the Farm Bokpoort 390.

The objectives were to:

- Identify possible archaeological, cultural and historic sites within the proposed development areas.
- Identify any potential 'fatal flaws' related to the proposed development;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance;
- Provide guideline measures to manage any impacts that might occur during the construction phase as well as the implementation phase.

1.2.2 *Assumptions and Limitations*

The investigation has been influenced by the following factors:

- It is assumed that the description of the proposed project, provided by the client, is accurate.
- The unpredictability of buried archaeological remains;
- The vegetation cover encountered during a site visit can have serious limitations on ground visibility, obscuring features (artefacts, structures) that might be an indication of human settlement;
- No subsurface investigation (i.e. excavations or sampling) were undertaken, since a permit from SAHRA is required for such activities;
- It is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is sufficient and that it does not have to be repeated as part of the heritage impact assessment.

2. LEGISLATIVE FRAMEWORK

2.1 Background

Heritage Impact Assessments are governed by national legislation and standards and International Best Practise. These include:

- South African Legislation
  - National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA);
  - Mineral and Petroleum Resources Development Act, 2002 (Act No. 22 of 2002) (MPRDA);
  - National Environmental Management Act 1998 (Act No. 107 of 1998) (NEMA); and
  - National Water Act, 1998 (Act No. 36 of 1998) (NWA).
- Standards and Regulations
  - South African Heritage Resources Agency (SAHRA) Minimum Standards;
  - Association of Southern African Professional Archaeologists (ASAPA) Constitution and Code of Ethics;
  - Anthropological Association of Southern Africa Constitution and Code of Ethics.
- International Best Practise and Guidelines
  - ICOMOS Standards (Guidance on Heritage Impact Assessments for Cultural World Heritage Properties); and
  - The UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage (1972).

2.2 Heritage Impact Assessment Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, Section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority.

The National Heritage Resources Act (Act No. 25 of 1999, Section 38) provides guidelines for Cultural Resources Management and prospective developments:

"38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as:

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50m in length;
(c) any development or other activity which will change the character of a site:
(i) exceeding 5 000 m^2 in extent; or
(ii) involving three or more existing erven or subdivisions thereof; or
(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or
(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development."

And:

"38 (3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

(a) The identification and mapping of all heritage resources in the area affected;
(b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;
(c) an assessment of the impact of the development on such heritage resources;
(d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
(e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
(f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
(g) plans for mitigation of any adverse effects during and after the completion of the proposed development."

3. HERITAGE RESOURCES

3.1 The National Estate

The National Heritage Resources Act (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- places, buildings, structures and equipment of cultural significance;

- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, including-
    - ancestral graves;
    - royal graves and graves of traditional leaders;
    - graves of victims of conflict;
    - graves of individuals designated by the Minister by notice in the Gazette;
    - historical graves and cemeteries; and
    - other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to the history of slavery in South Africa;
- movable objects, including-
    - objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
    - objects to which oral traditions are attached or which are associated with living heritage;
    - ethnographic art and objects;
    - military objects;
    - objects of decorative or fine art;
    - objects of scientific or technological interest; and
    - books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

3.2 Cultural significance

In the NHRA, Section 2 (vi), it is stated that ‘‘cultural significance’’ means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature’s uniqueness, condition of preservation and research potential.

According to Section 3(3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of

- its importance in the community, or pattern of South Africa's history;
- its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- sites of significance relating to the history of slavery in South Africa.

A matrix (see Section 2 of Addendum) was developed whereby the above criteria were applied for the determination of the significance of each identified site. This allowed some form of control over the application of similar values for similar identified sites.

4. PROJECT DESCRIPTION

4.1 Site location

The proposed development is located on the Farm Bokpoort 390, which is 20 km north-north-west of the town of Groblershoop within the !Kheis Local municipality in the ZF Mgcawu District Municipality, Northern Cape Province (Fig. 1). For more information, see the Technical Summary on p. V above.

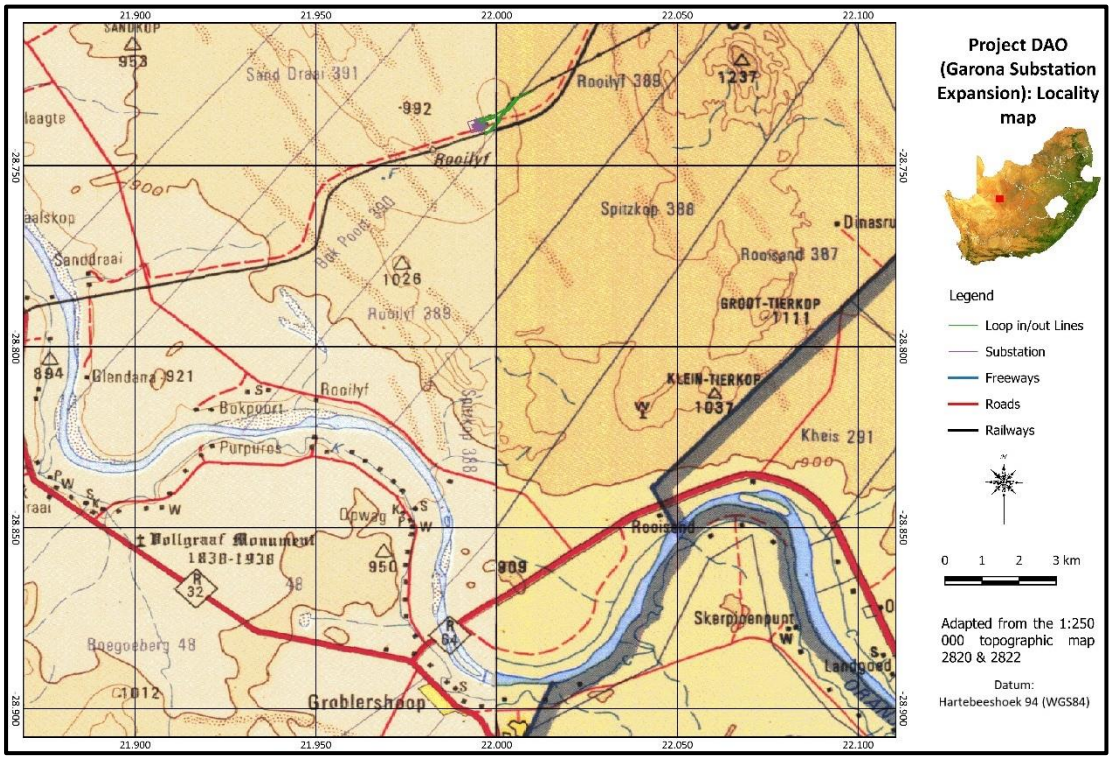


Figure 1. Location of the project area in regional context

4.2 Development proposal

It is proposed to construct a 400kV loop-in loop-out power line as well as expand the existing Garona Substation. The scope of work, as supplied by ACWA Power, include (Fig. 2):

Option 1 (preferred)

Upstream scope of work at Garona Substation:
- Establish a 400 kV busbar at Garona Substation,
- Establish and equip 2 x 400 kV feeder bays.
- Loop in and out of Ferrum – Nieuwehoop 400 kV lines (approx. 2 x 5 km) into Garona Substation.

Shared scope of work at Garona Substation:
- Extend the 132 kV busbar at Garona Substation (to accommodate the 400/132 kV transformer),
- Install a 500 MVA 400/132kV transformer with associated transformer bays, and
- Provide space for 1 future 400/132 kV transformer.

Dedicated scope of work at Garona Substation:
- Equip and commission the 1x 132 kV feeder bay.

Option 2 (alternative)

This option will only require the project to build a substation on the Project site with a 400kV loop in and loop out toward the Ferum-Niewenhoop line (which runs adjacent to the project site). It will not require any pylons/towers to be constructed in any unauthorised areas. The exact same scope will be facilitated within the project site boundary as option 1.

Work at Project DAO Substation:
- Establish a 400 kV busbar at DAO Substation,
- Establish and equip 2 x 400 kV feeder bays.
- Loop in and out of Ferrum – Nieuwehoop 400 kV line (existing).
- Install a 500 MVA 400/132kV transformer with associated transformer bays
- Equip and commission the 1 x 132kV feeder bay.
- Provide space for 1 future 400/132 kV transformer.

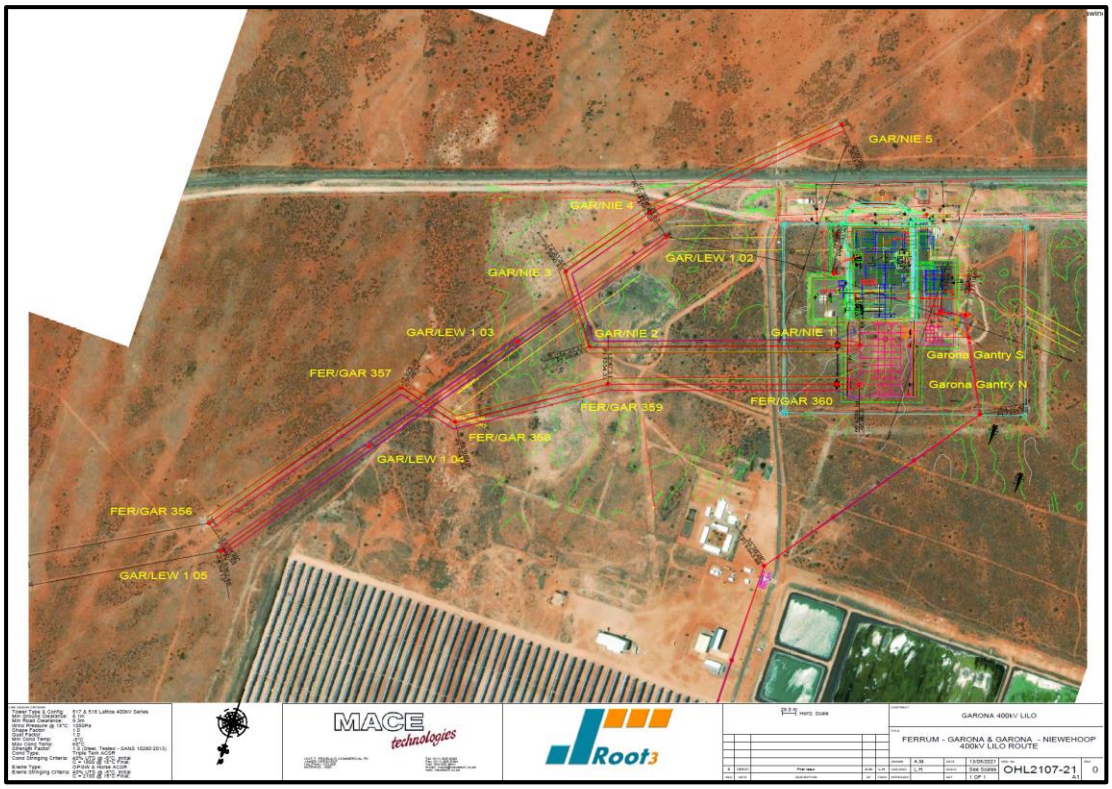


Figure 2. The location of the project area on the relevant property
(Map supplied by ACWA Power)(Please note that North is located to the bottom of the map)

5. STUDY APPROACH AND METHODOLOGY

5.1 Extent of the Study

This survey and impact assessment cover all facets of cultural heritage located in the project area as presented in Section 4 above and illustrated in Figures 1 & 2.

5.2 Methodology

5.2.1 Pre-feasibility assessment

The objectives of this review were to:

- Gain an understanding of the cultural landscape within which the project is located;
- Inform the field survey.

5.2.1.1 Survey of the literature
A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological and historical sources were consulted – see list of references in Section 11.

- Information on events, sites and features in the larger region were obtained from these sources.

5.2.1.2 Survey of heritage impact assessments (HIAs)
A survey of HIAs done for projects in the region by various heritage consultants was conducted with the aim of determining the heritage potential of the area – see list of references in Section 11.

- Information on sites and features in the larger region were obtained from these sources.

5.2.1.3 Data bases
The *Heritage Atlas Database,* various SAHRA databases, the *Environmental Potential Atlas*, the *Chief Surveyor General* and the *National Archives of South Africa* were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed prospecting activities.

5.2.1.4 Other sources
Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Information on sites and features in the larger region were obtained from these sources.

The results of the above investigation are presented in Figure 3 below – see list of references in Section 11 – and can be summarised as follows:

- Stone tools, mostly dating to the Middle Stone Age (MSA), occur sporadically across the larger region and is mostly located on hills, outcrops and along drainage channels;
- Historic structures, inclusive of buildings and bridges, occur in a sporadic manner across the larger landscape as well as in urban centres;
- Formal and informal burial sites occur in a number of places in towns and across the countryside.

Based on the above assessment, the probability of cultural heritage sites, features and objects occurring in the study area is deemed to be **very low**.

Table 1: Pre-Feasibility Assessment

Category	Period	Probability	Reference
Natural			
Landscapes		None	Old maps and aerial photographs
Early hominin	Pliocene – Lower Pleistocene		
	Early hominin	None	
Stone Age	Lower Pleistocene – Holocene		
	Early Stone Age	None	
	Middle Stone Age	Low	Dreyer (2014, 2015); Morris (2012, 2014); van der Walt (2015a, 2015b); van Ryneveld (2007); van Schalkwyk (2011, 2019)
	Later Stone Age	Low	
	Rock Art	None	
Iron age	Holocene		
	Early Iron Age	None	
	Middle Iron Age	None	
	Late Iron Age	None	
Colonial period	Holocene		
	Contact period/Early historic	Possible	Dreyer (2014)
	Recent history	Possible	Van der Walt (2015a); van Schalkwyk (2019, 2020)
	Industrial heritage	None	

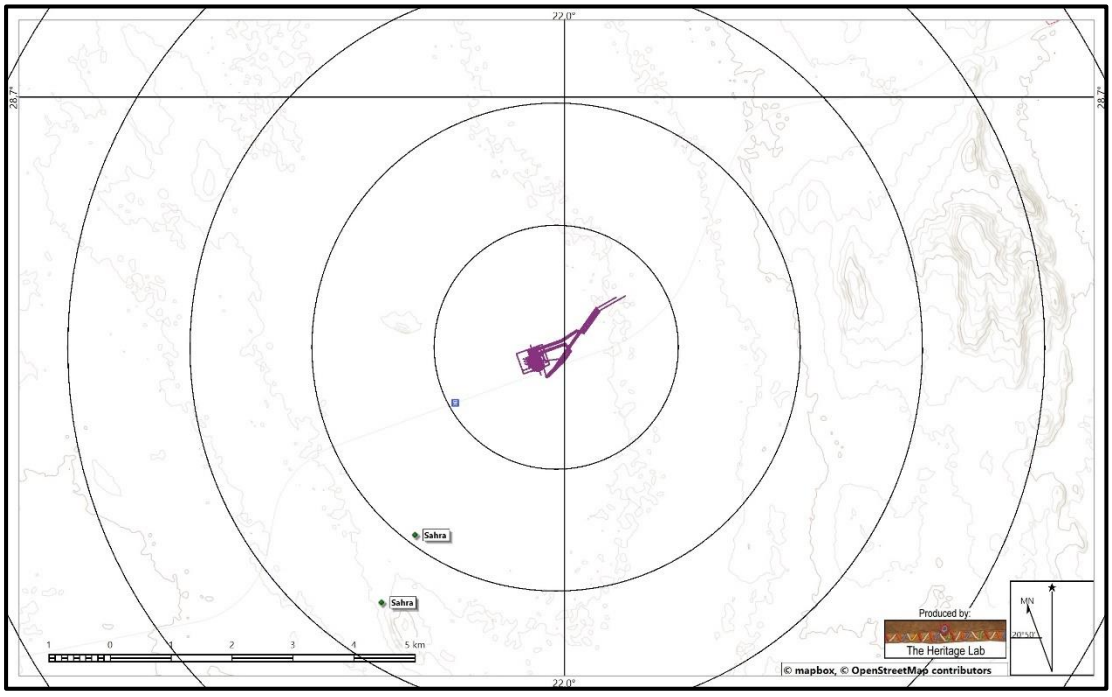


Figure 3. Location of known heritage sites and features in relation to the project area
(Circles spaced at 2km: heritage sites = coded green dots)

5.2.2 *Field survey*

The field survey was done according to generally accepted archaeological practices, and was aimed at locating all possible sites, objects and structures. The area that had to be investigated was identified by

the *ACWA Power* by means of maps and .k*ml* files indicating the project area. This was loaded onto a Samsung digital device and used in Google Earth during the field survey to access the area.

The project area was visited on 8 June 2021. During the site visit, archaeological visibility was good as there is little vegetation cover, the result of a long period of regional drought.

The project area was investigated by walking the route of the proposed power line, specifically inspecting animal burrows and outcrops (Fig. 4).

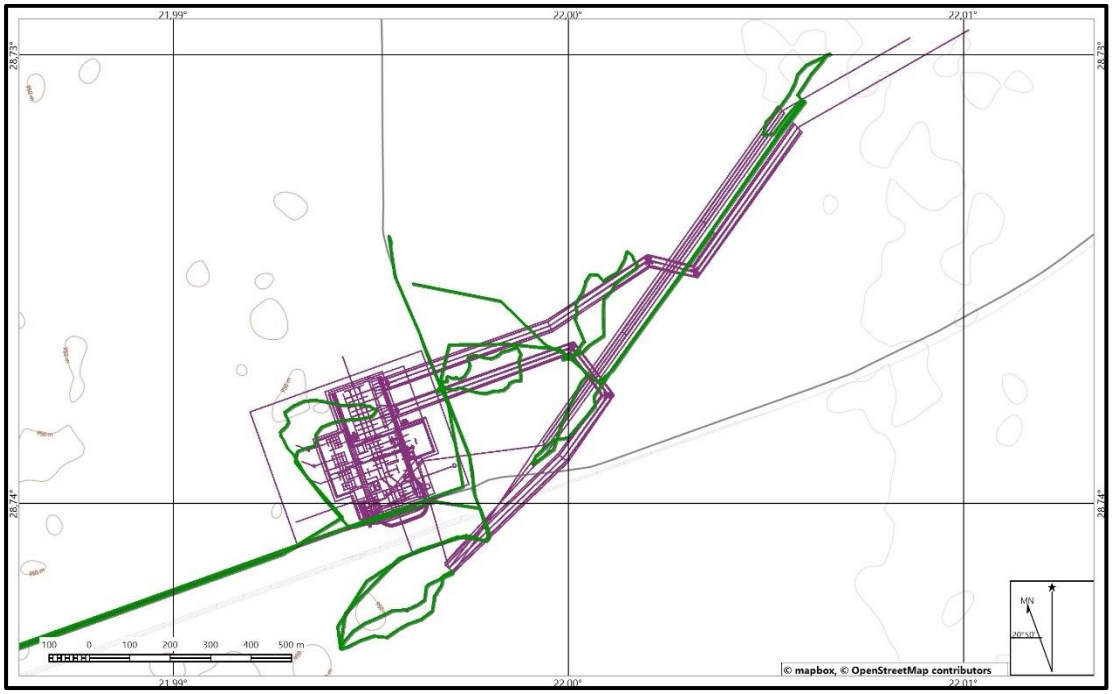


Figure 4. Map indicating the track log of the field survey
(Project area = purple polygon; tracklog = green)

5.2.3 *Documentation*

All sites, objects and structures that are identified are documented according to the general minimum standards accepted by the archaeological profession. Coordinates of individual localities are determined by means of the *Global Positioning System* (GPS) and plotted on a map. This information is added to the description in order to facilitate the identification of each locality. Map datum used: Hartebeeshoek 94 (WGS84).

The track log and identified sites were recorded by means of a Garmin Oregon 550 handheld GPS device. Photographic recording was done by means of a Canon EOS 550D digital camera. Geo-rectifying of the aerial photographs and historic maps was done by means of a professional software package: ExpertGPS.

6. DESCRIPTION OF THE AFFECTED ENVIRONMENT

6.1 Natural Environment

The geology of the study area is made up of superficial deposits comprising gravels, clays, sandstone, silcrete, calcrete and aeolian sand. The topography is described as plains and no rivers, outcrops or hills occur in the study area or its immediate vicinity (Fig. 5).

The original vegetation in the study area is classified as Kalahari Karroid Shrubland, part of the Nama-Karoo Biome, which is part of the Bushmanland Bioregion (Muncina & Rutherford 2006) (Fig. 6).

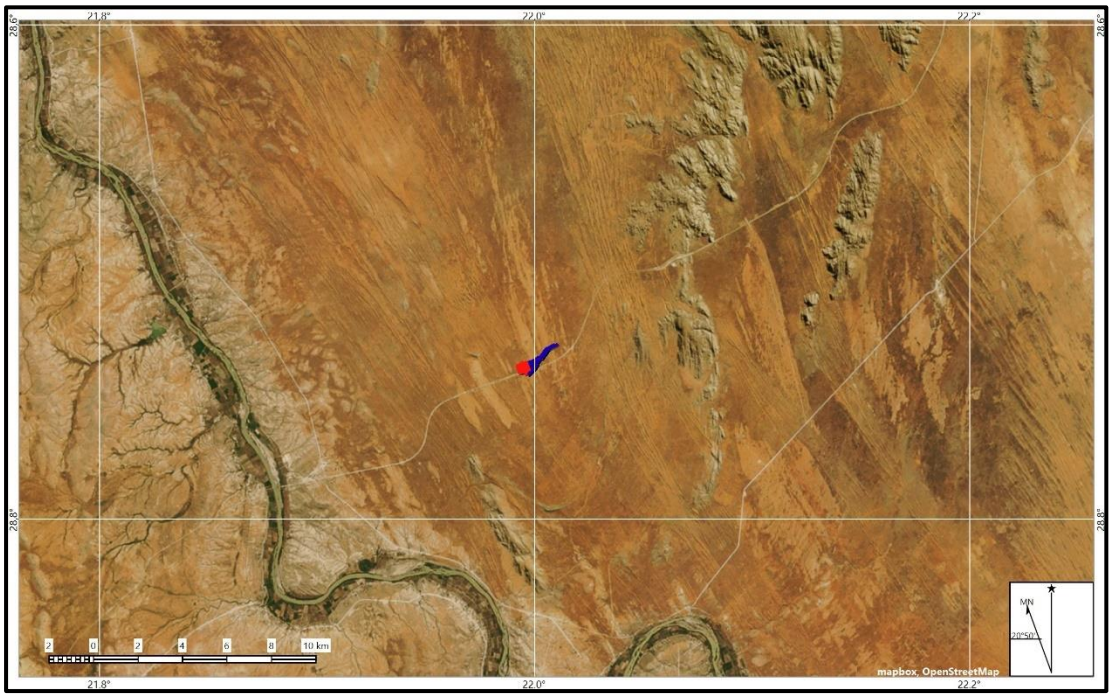


Figure 5. The topography of the larger region

Looking from north to south

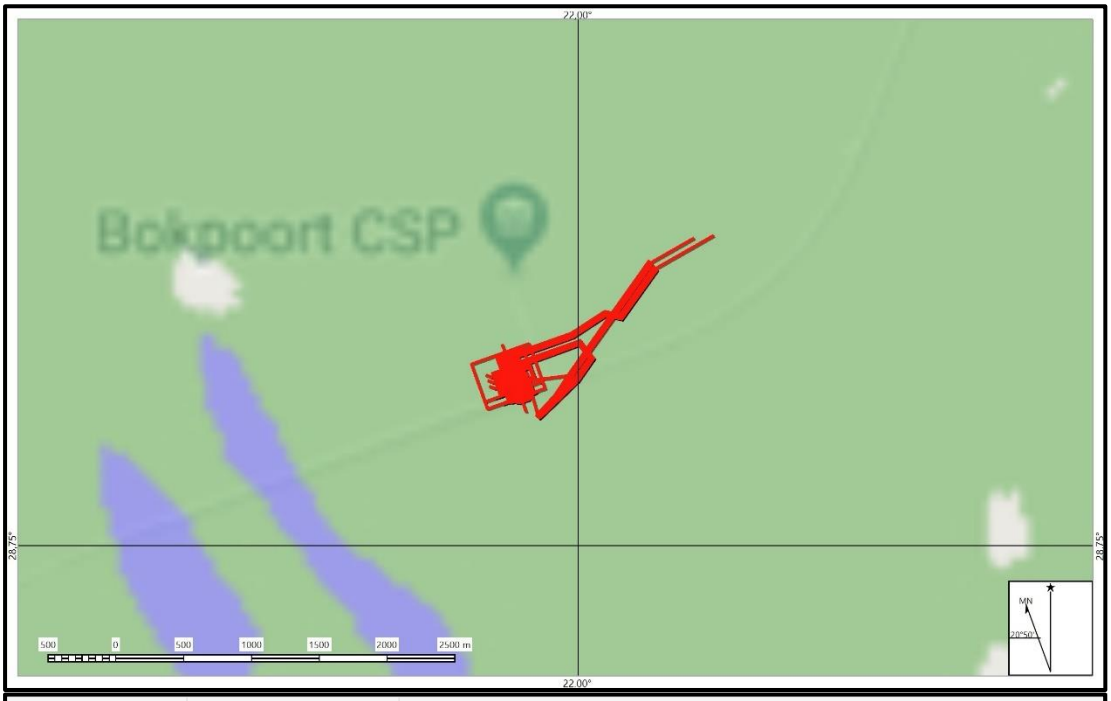
Old constructor's area

Garona Substation

Looking from south to north

Figure 6. Views over the project area

The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that the project area (Fig. 7) has a moderate sensitivity of fossil remains to be found and therefore a palaeontological desktop assessment is required.



Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 7. The Palaeontological sensitivity of the project area

6.2 Cultural Landscape

The aim of this section is to present an overview of the history of the larger region in order to eventually determine the significance of heritage sites identified in the project area, within the context of their historic, aesthetic, scientific and social value, rarity and representivity.

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually gave rise to an urban component which manifest in a number of small towns and an intensive farming industry.

6.2.1 *Stone Age*

Surveys in the area has revealed that the archaeological record in the larger region is temporarily confined to the Early and Middle Stone Age, with a smaller occurrence dating to the Later Stone Age. It is spatially concentrated around the rims of pans, the banks of stream and rivers (Morris 2005), but also in the vicinity of raw material resources.

Recently Parsons (2007, 2008) demonstrated that the so-called Swartkop and Doornfontein industries possibly relate to different socio-economies – those of hunter-gatherers and stock keepers. Based on an analysis of material recovered from five sites in the Northern Cape Province, all dating to the last two millennia, she compares variability between assemblages attributed to the Swartkop and Doornfontein industries and identify areas of overlap and difference.

6.2.2 *Iron Age*

Early Iron Age occupation did not take place in the region and seems as if the earliest Bantu-language speakers to have settled in the larger region were those of Tswana-speaking origin (Tlhaping and Tlharo) that settled mostly to the north and a bit to the west of Kuruman. However, they continued spreading westward and by the late 18th century some groups occupied the Langeberg region. With the annexation of the Tswana areas by the British in 1885, the area became known as British Betchuana Land. A number of reserves were set up for these people to stay in. In 1895 the Tswana-speakers rose up in resistance to the British authority as represented by the government of the Cape Colony. They were quickly subjected, and their land was taken away, divided up into farms and given out to white farmers to settle on (Snyman 1986).

In his study on the spread of the Iron Age into the Northern Cape, Humphreys (1976) used not only archaeological evidence, literary sources and eyewitness accounts, but also environmental factors such as rainfall data and vegetation cover. From this he concluded that it was not an environment conducive for keeping large herds of cattle, which was the mainstay of Iron Age communities' economy. He even indicates that the occupation of these people contracted from 1700 south of Postmasburg to just south of Kuruman by 1800, indicating a huge change in environmental factors.

Although some researchers would want to identify isolated, undecorated pieces of pottery found in the vicinity of Douglas as of Late Iron Age origin, this is doubtful as they also do not consider the possibility of it being of Khoi origin. Or, alternatively, of very recent origin, i.e. brought into the region by people working as labourers on the various diamond diggings in the larger region.

6.2.3 *Historic period*

It was only during the last part of the 19th century, early part of the 20th century when population numbers in the region increased. This was the result of intensive irrigation farming that developed along the Orange River.

The town of Upington, originally known as Olijvenhoutsdrift, was founded in 1871 as part of a mission station by the German missionary Rev Schröder. The town was renamed in 1884 after Sir Thomas Upington, who was the Prime Minister of the Cape Colony and who visited the town in 1884.

An irrigation canal was started by Rev Schröder in 1883. It was completed in 1885. By 1884 there were already 77 irrigation farms. Nowadays, it is disputed that Schröder was the original builder of the canal, and it is claimed that he only carried on with an idea that was started by a local inhabitant by the name of Abraham September.

Groblershoop developed as a result of development of the Boegoeberg Dam and water channels in 1929, which gave rise to grapes and wine production. During the Rebellion of 1914, a number of skirmishes were fought in the region.

6.3 Site specific review

Although landscapes with cultural significance are not explicitly described in the NHRA, they are protected under the broad definition of the National Estate (Section 3): Section 3(2)(c) and (d) list "historical settlements and townscapes" and "landscapes and natural features of cultural significance" as part of the National Estate.

The examination of historical maps and aerial photographs help us to reconstruct how the cultural landscape has changed over time as is show how humans have used the land.

As this used to be a very isolated region, little information exists about it. It was only recently when a number of development projects were initiated in the region, that the heritage potential of the region was investigated. Most of these studies focussed on the Stone Age presence in the region, which, by all accounts seems to be very limited (Dreyer 2014, 2015; Morris 2014, 2018; van der Walt 2015; van Schalkwyk 2019) as it presents a very low profile in the landscape.

From the Deed of Transfer no. 1294 (Fig. 8), it can be seen that the farm was first surveyed in December 1892 and then granted to F.W.C Loxton on 14 November 1894.

One of the older maps of the region (Fig. 9), dating to 1914, shows an area with little development in the interior, where only an isolated sheep post and vehicle tracks is indicated. To the west a number of presumably farm names are indicated in the vicinity of the Orange River.

The official aerial photograph dating to 1964 (Fig. 10) still shows, apart from fence boundaries, a landscape empty of any development. It was only by the middle of the 1970s when the Sishen-Saldanha railway line was opened (1976) and the associated powerlines were constructed, that any development can be seen. This presented on the 1982 version of the 1:50 000 topographic map (11).

However, this lack of development, i.e. built environment, seems to continue as can be seen on the various Google Image aerial photographs (Fig. 12) and it is only with the recent development of the Bokpoort Concentrated Solar Thermal that some built features were added to the region.

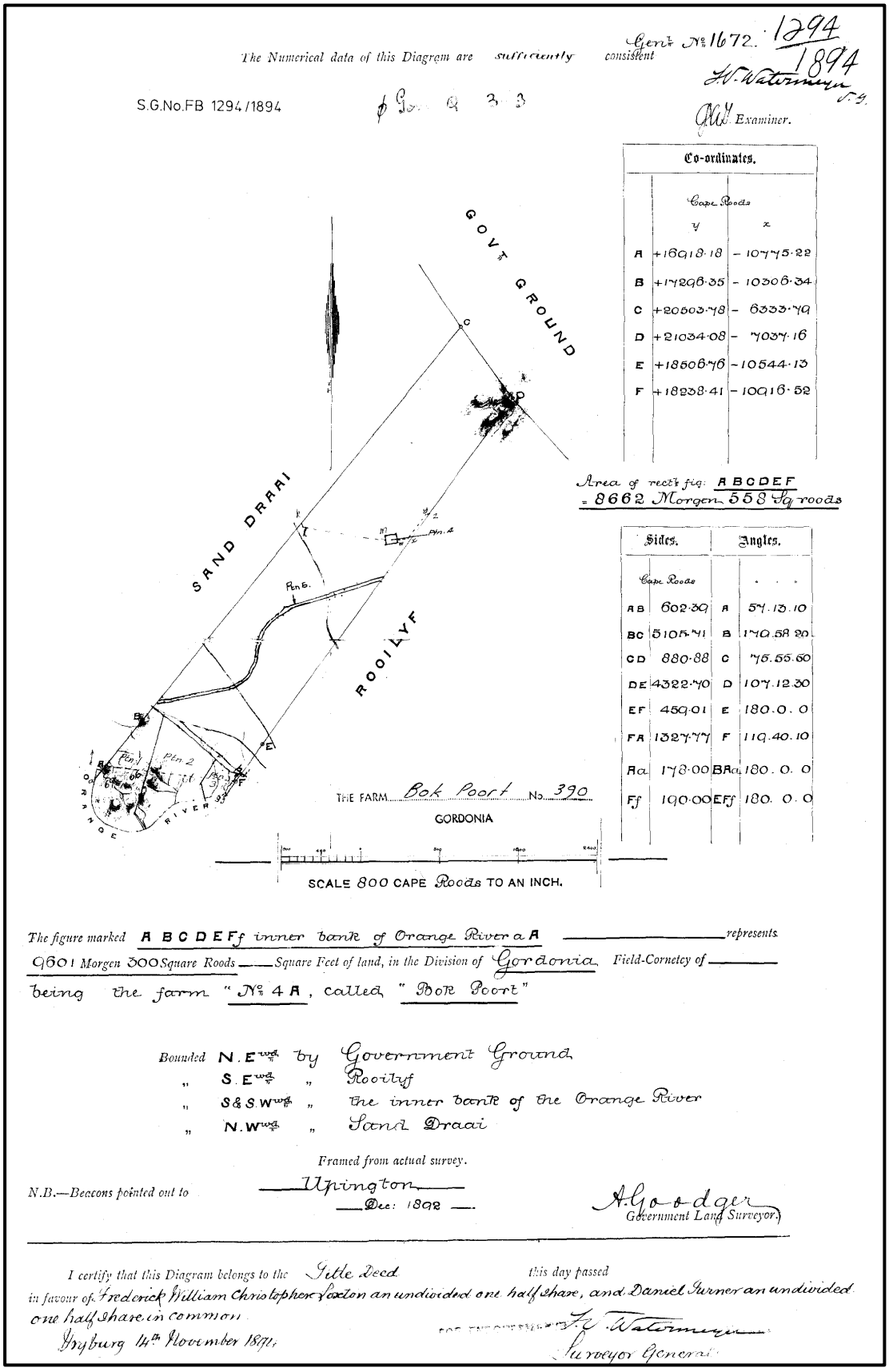


Figure 8. Copy of the original Deed of Transfer for the farm Bokpoort (Chief Surveyor-General: 10026W01)

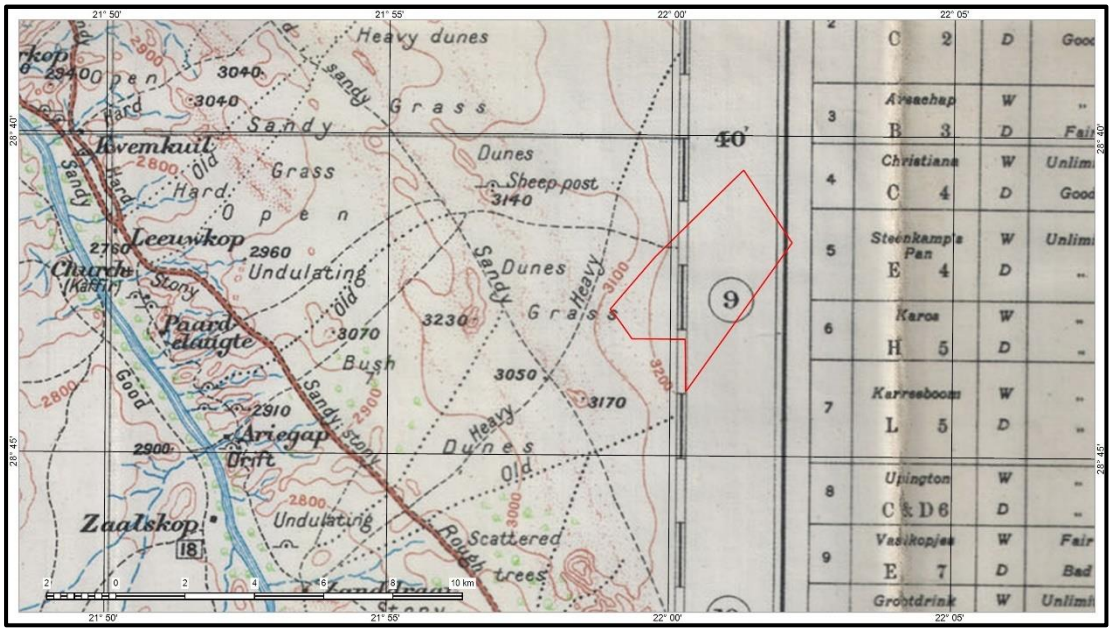


Figure 9. The study areas on the 1914 version of the 1:250 000 topographic map 'Upington'

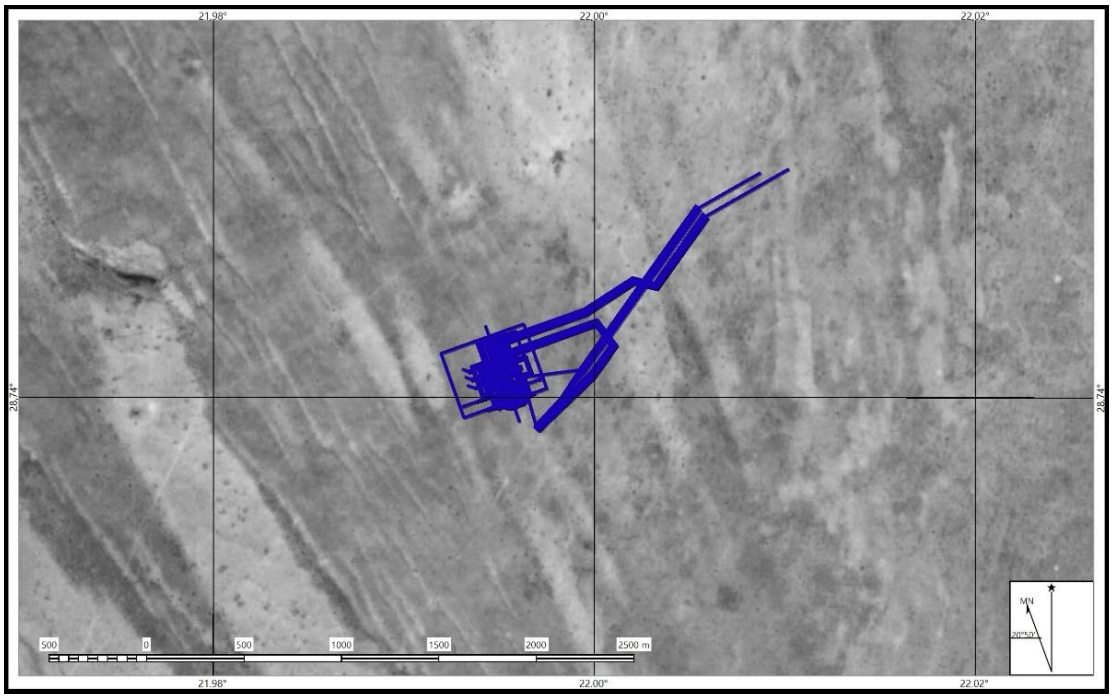


Figure 10. The study area on the 1964 version of the official aerial photograph (Photograph: 524_003_00863)

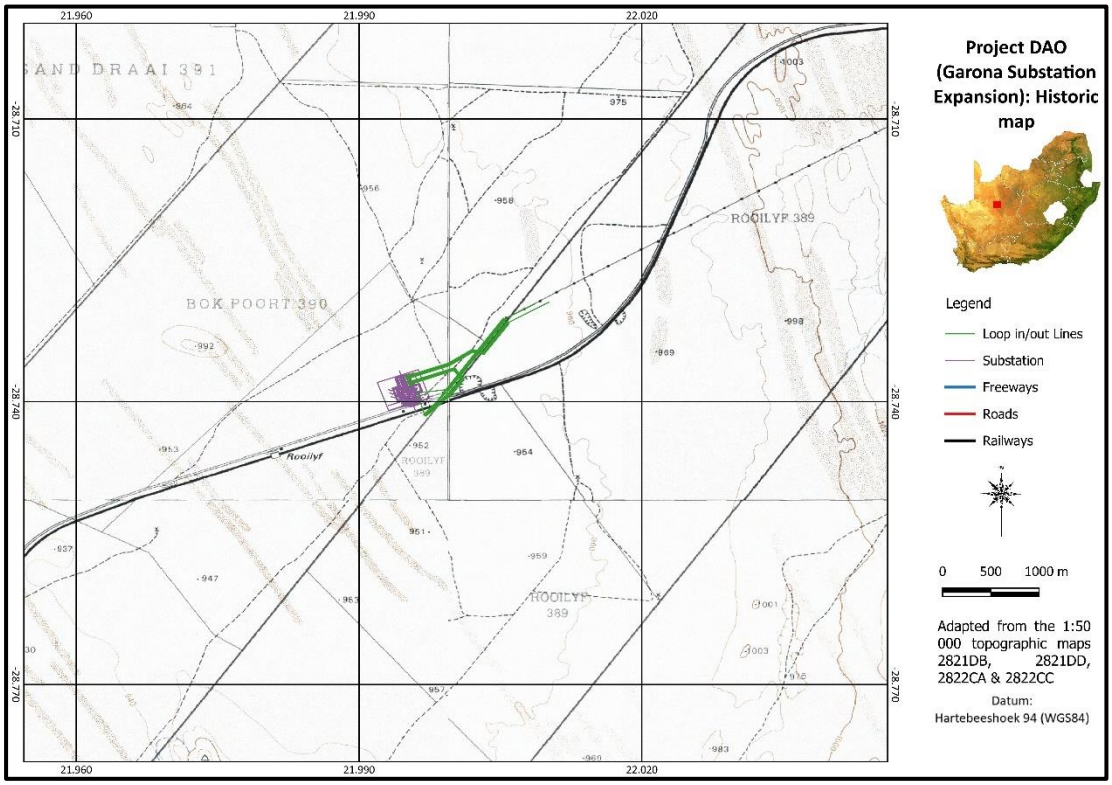


Figure 11. The study area on the 1982 version of the 1:50 000 topographic maps

Figure 12. Aerial view of the project area in 2021
(Image: Google Earth)

7. SURVEY RESULTS

During the survey, the following sites, features and objects of cultural significance were identified in the project area (Fig. 13).

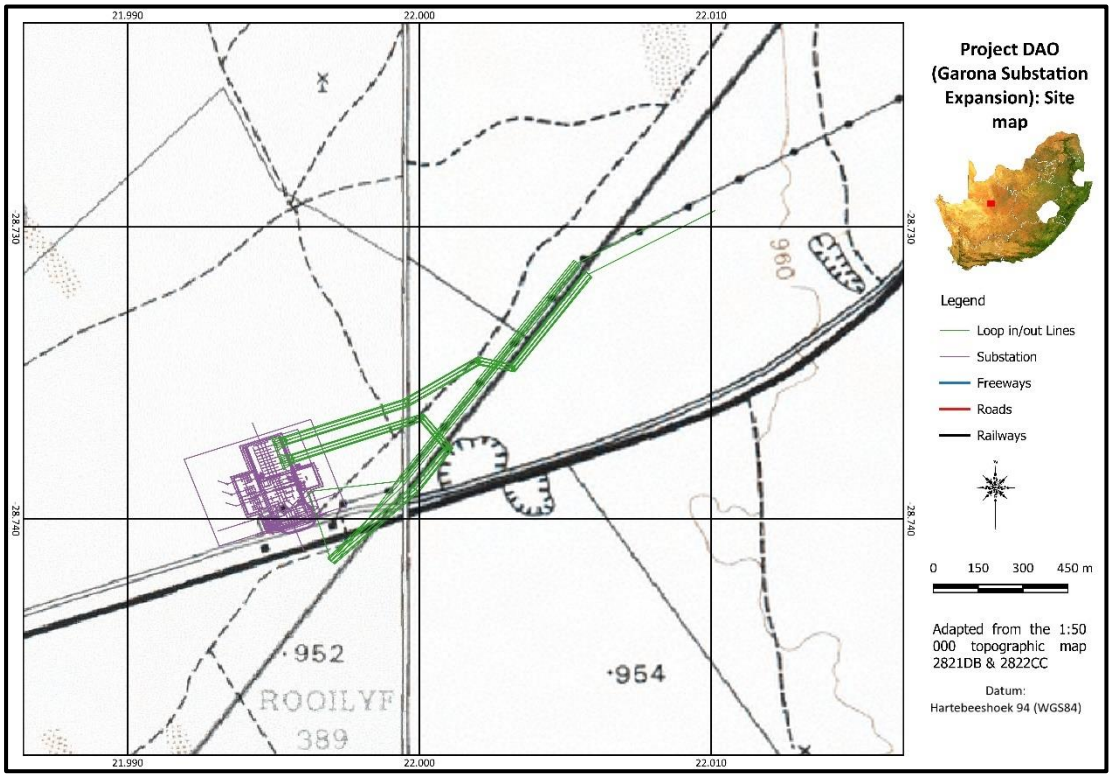


Figure 13. Location of heritage sites in the project area
(Please note that as no sites were identified, nothing is shown on the map)

7.1 Stone Age

- No sites, features or objects of cultural significance dating to the Stone Age were identified in the project area.

7.2 Iron Age

- No sites, features or objects of cultural significance dating to the Iron Age were identified in the project area.

7.3 Historic period

- No sites, features or objects of cultural significance dating to the historic period were identified in the project area.

8. IMPACT ASSESSMENT RATINGS AND MITIGATION MEASURES

8.1 Impact assessment

Heritage impacts are categorised as:

- Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries;
- Indirect impacts, e.g. restriction of access or visual intrusion concerning the broader environment;
- Cumulative impacts that are combinations of the above.

Table 2: Impact assessment

Garona Substation expansion and 400kV Loop-in Loop-out line		
Impact assessment		
As no sites, features or objects of cultural heritage significance were identified on the project area, there would be no impact as a result of the proposed development		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Permanent (5)	Permanent (5)
Intensity	Minor (2)	Minor (2)
Probability	Very improbable (1)	Very improbable (1)
Significance	Low (8)	Low (8)
Status (positive or negative)	Neutral	Neutral
Reversibility	n/a	n/a
Irreplaceable loss of resources?	No	No
Can impacts be mitigated	n/a	
Mitigation: None required		
Cumulative impact: None		

8.2 Mitigation measures

Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

- For the current study, as no sites, features or objects of cultural significance were identified, no mitigation measures are proposed.

9. MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

Sources of risk were considered with regards to development activities defined in Section 2(viii) of the NHRA that may be triggered and are summarised in Table 3A and 3B below. These issues formed the basis of the impact assessment described. The potential risks are discussed according to the various phases of the project below.

9.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities.

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

9.2 Control

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

Table 3A: Construction Phase: Environmental Management Programme for the project

Action required	Protection of heritage sites, features and objects		
Potential Impact	The identified risk is damage or changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA that may occur in the proposed project area.		
Risk if impact is not mitigated	Loss or damage to sites, features or objects of cultural heritage significance		
Activity / issue	**Mitigation: Action/control**	**Responsibility**	**Timeframe**
1. Removal of Vegetation 2. Construction of required infrastructure,	See discussion in Section 9.1 above	Environmental Control Officer	During construction only

e.g. access roads, water pipelines			
Monitoring	See discussion in Section 9.2 above		

Table 3B: Operation Phase: Environmental Management Programme for the project

Action required	Protection of heritage sites, features and objects		
Potential Impact	It is unlikely that the negative impacts identified for pre-mitigation will occur if the recommendations are followed.		
Risk if impact is not mitigated	Loss or damage to sites, features or objects of cultural heritage significance		
Activity / issue	**Mitigation: Action/control**	**Responsibility**	**Timeframe**
1. Construction of additional required infrastructure, e.g. access roads, water pipelines	See discussion in Section 9.1 above	Environmental Control Officer	During construction only
Monitoring	See discussion in Section 9.2 above		

9.3 Legal requirements

The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that no sites, features or objects of heritage significance occur in the project area. Therefore, no permits are required from SAHRA or the PHRA.

- If heritage features are identified during construction, as stated in the management recommendations, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

10. CONCLUSIONS AND RECOMMENDATIONS

Royal Haskoning DHV was appointed as independent environmental consultant to undertake the Basic Assessment Process for the construction of the Ferrum – Garona and Garona – Niewehoop 400kV loop in loop out route and expansion of the Garona Substation for Project DAO (formerly Bokpoort Solar Photovoltaic (PV) Energy Facility) near Groblershoop, !Kheis Local Municipality, Northern Cape Province.

This report describes the methodology used, the limitations encountered, the heritage features that were identified and the recommendations and mitigation measures proposed relevant to this. The HIA consisted of a desktop study (archival sources, database survey, maps and aerial imagery) and a physical survey that included the interviewing of relevant people. It should be noted that the implementation of the mitigation measures is subject to SAHRA/PHRA's approval.

Identified sites

During the survey no sites, features or objects of cultural heritage significance was identified to occur in the project area.

Impact assessment and proposed mitigation measures

Impact analysis of cultural heritage resources under threat of the proposed development, is based on the present understanding of the development:

- For the current study, as no sites, features or objects of cultural significance were identified, no mitigation measures are proposed.

Legal requirements

The legal requirements related to heritage specifically are specified in Section 3 of this report.

- For this proposed project, the assessment has determined that no sites, features or objects of cultural heritage significance occur in the project area, therefore no permits are required from SAHRA or the PHRA.
- If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view, it is recommended that the proposed activities be allowed to continue on acceptance of the proposed mitigation measures and the conditions proposed below.

Conditions for inclusion in the environmental authorisation:

- The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that the project area has a moderate sensitivity of fossil remains to be found and therefore a palaeontological desktop assessment is required.
- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. The appropriate steps to take are indicated in Section 9 of the report, as well as in the **Management Plan: Burial Grounds and Graves, with reference to general heritage sites**, in the Addendum, Section 12.4.

11. REFERENCES

11.1 Data bases

Chief Surveyor General
Environmental Potential Atlas, Department of Environmental Affairs and Tourism.
Heritage Atlas Database, Pretoria
National Archives of South Africa
SAHRA Archaeology and Palaeontology Report Mapping Project (2009)
SAHRIS Database

11.2 Literature

De Jong, R.C. 2010. *Draft heritage impact assessment report: proposed land use change to provide for irrigated agricultural activities on the remainder of Holding 189, Kakamas North Settlement, Kai! Garib municipality, Northern Cape Province.* Unpublished report 2010/37. Pretoria.

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11.3 Archival sources, maps and aerial photographs

1: 50 000 Topographic maps
Google Earth
Aerial Photographs: Chief Surveyor-General
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12. ADDENDUM

1. Indemnity and terms of use of this report

The findings, results, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and the author reserve the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

Although all possible care is taken to identify all sites of cultural importance during the investigation of project areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. The author of this report will not be held liable for such oversights or for costs incurred as a result of such oversights.

Although the author exercises due care and diligence in rendering services and preparing documents, he accepts no liability and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of the information contained in this document.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

2. Assessing the significance of heritage resources and potential impacts

A system for site grading was established by the NHRA and further developed by the South African Heritage Resources Agency (SAHRA 2007) and has been approved by ASAPA for use in southern Africa and was utilised during this assessment.

2.1 *Significance of the identified heritage resources*

According to the NHRA, Section 2(vi) the **significance** of a heritage sites and artefacts is determined by it aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. SITE EVALUATION			
1.1 Historic value			
Is it important in the community, or pattern of history			
Does it have strong or special association with the life or work of a person, group or organisation of importance in history			
Does it have significance relating to the history of slavery			
1.2 Aesthetic value			
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group			
1.3 Scientific value			
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage			
Is it important in demonstrating a high degree of creative or technical achievement at a particular period			
1.4 Social value			
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons			
1.5 Rarity			
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage			
1.6 Representivity			
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects			
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class			
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.			
2. Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific community			
3. Field Register Rating			
1.	National/Grade 1: High significance - No alteration whatsoever without permit from SAHRA		
2.	Provincial/Grade 2: High significance - No alteration whatsoever without permit from provincial heritage authority.		
3.	Local/Grade 3A: High significance - Mitigation as part of development process not advised.		

4.	Local/Grade 3B: High significance - Could be mitigated and (part) retained as heritage register site	
5.	Generally protected 4A: High/medium significance - Should be mitigated before destruction	
6.	Generally protected 4B: Medium significance - Should be recorded before destruction	
7.	Generally protected 4C: Low significance - Requires no further recording before destruction	

2.2 *Significance of the anticipated impact on heritage resources*

All impacts identified during the HIA stage of the study will be classified in terms of their significance. Issues would be assessed in terms of the following criteria:

Nature of the impact
A description of what causes the effect, what will be affected and how it will be affected.

Extent
The physical **extent**, wherein it is indicated whether:
- 1 - The impact will be limited to the site;
- 2 - The impact will be limited to the local area;
- 3 - The impact will be limited to the region;
- 4 - The impact will be national; or
- 5 - The impact will be international.

Duration
Here it should be indicated whether the lifespan of the impact will be:
- 1 - Of a very short duration (0–1 years);
- 2 - Of a short duration (2-5 years);
- 3 - Medium-term (5–15 years);
- 4 - Long term (where the impact will persist possibly beyond the operational life of the activity); or
- 5 - Permanent (where the impact will persist indefinitely).

Magnitude (Intensity)
The magnitude of impact, quantified on a scale from 0-10, where a score is assigned:
- 0 - Small and will have no effect;
- 2 - Minor and will not result in an impact;
- 4 - Low and will cause a slight impact;
- 6 - Moderate and will result in processes continuing but in a modified way;
- 8 - High, (processes are altered to the extent that they temporarily cease); or
- 10 - Very high and results in complete destruction of patterns and permanent cessation of processes.

Probability
This describes the likelihood of the impact actually occurring and is estimated on a scale where:
- 1 - Very improbable (probably will not happen);
- 2 - Improbable (some possibility, but low likelihood);
- 3 - Probable (distinct possibility);
- 4 - Highly probable (most likely); or
- 5 - Definite (impact will occur regardless of any prevention measures).

Significance
The significance is determined through a synthesis of the characteristics described above (refer to the formula below) and can be assessed as low, medium or high:

S = (E+D+M) x P; where
S = Significance weighting

E = Extent
D = Duration
M = Magnitude
P = Probability

Significance of impact		
Points	Significant Weighting	Discussion
< 30 points	Low	Where this impact would not have a direct influence on the decision to develop in the area.
31-60 points	Medium	Where the impact could influence the decision to develop in the area unless it is effectively mitigated.
> 60 points	High	Where the impact must have an influence on the decision process to develop in the area.

Confidence
This should relate to the level of confidence that the specialist has in establishing the nature and degree of impacts. It relates to the level and reliability of information, the nature and degree of consultation with I&AP's and the dynamic of the broader socio-political context.

- High, where the information is comprehensive and accurate, where there has been a high degree of consultation and the socio-political context is relatively stable.
- Medium, where the information is sufficient but is based mainly on secondary sources, where there has been a limited targeted consultation and socio-political context is fluid.
- Low, where the information is poor, a high degree of contestation is evident and there is a state of socio-political flux.

Status
- The status, which is described as either positive, negative or neutral.

Reversibility
- The degree to which the impact can be reversed.

Mitigation
- The degree to which the impact can be mitigated.

Nature:		
	Without mitigation	With mitigation
Construction Phase		
Probability		
Duration		
Extent		
Magnitude		
Significance		
Status (positive or negative)		
Operation Phase		
Probability		
Duration		
Extent		
Magnitude		
Significance		
Status (positive or negative)		
Reversibility		
Irreplaceable loss of resources?		
Can impacts be mitigated		

3. Mitigation measures

- *Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.*

Impacts can be managed through one or a combination of the following mitigation measures:

- Avoidance
- Investigation (archaeological)
- Rehabilitation
- Interpretation
- Memorialisation
- Enhancement (positive impacts)

For the current study, the following mitigation measures are proposed, to be implemented only if any of the identified sites or features are to be impacted on by the proposed development activities:

- (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and applies where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources. The site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall). Depending on the type of site, the buffer zone can vary from
    - 10 metres for a single grave, or a built structure, to
    - 100 metres where the boundaries are less obvious, e.g. a Late Iron Age site.

- (2) Archaeological investigation/Relocation of graves: This option can be implemented with additional design and construction inputs. This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated. Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards. This can only be done by a suitably qualified archaeologist.
    - This option should be implemented when it is impossible to avoid impacting on an identified site or feature.
    - This also applies for graves older than 60 years that are to be relocated. For graves younger than 60 years a permit from SAHRA is not required. However, all other legal requirements must be adhered to.
        - Impacts can be beneficial – e.g. mitigation contribute to knowledge

- (3) Rehabilitation: When features, e.g. buildings or other structures are to be re-used. Rehabilitation is considered in heritage management terms as an intervention typically involving the adding of a new heritage layer to enable a new sustainable use.
    - The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.
    - Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.
        - Conservation measures would be to record the buildings/structures as they are (at a particular point in time). The records and recordings would then become the 'artefacts' to be preserved and managed as heritage features or (movable) objects.
        - This approach automatically also leads to the enhancement of the sites or features that are re-used.

- (4) Mitigation is also possible with additional design and construction inputs. Although linked to the previous measure (rehabilitation) a secondary though 'indirect' conservation measure would be to use the existing architectural 'vocabulary' of the structure as guideline for any new designs.
    - The following principle should be considered: **heritage informs design**.
        - This approach automatically also leads to the enhancement of the sites or features that are re-used.

- (5) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report.
    - Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage/remains are destroyed.

4. Management Plan: Burial Grounds and Graves, with reference to general heritage sites

1. Background

Burial grounds and graves are viewed as having high emotional and sentimental value and accordingly always carry a high cultural heritage significance rating. Best practice principles dictate that they should preferably be preserved *in situ*. It is only when it is unavoidable and the site cannot be retained, that the graves should be exhumed and relocated after all due processes had been successfully implemented.

For retaining the burial sites and graves, the SAHRA Burial Grounds and Graves (BGG) unit requires a detailed Heritage Management Plan (HMP) clearly outlining a grave management plan that provides details of grave management and access protocols. In addition, the HMP should also provide detailed change finds protocol or procedures in the case of the identification human remains.

The primary aim of the Burial Grounds and Graves Management Plan therefore is to assist in the implementation of mitigation measures to reduce potential negative impacts through the modification of the proposed project development design.

2. Legal Implications

South Africa's unique and non-renewable archaeological and palaeontological heritage sites, inclusive of burial grounds and graves, are 'generally' protected in terms various laws and by-laws:

- Nationally: National Heritage Resources Act, No. 25 of 1999;
- Provincially: KwaZulu-Natal Heritage Act, No. 4 of 2008.

In addition, the following also refer specifically to burial grounds and graves:
- Human Tissue Act, No. 65 of 1983;
- Section 46 of the National Health Act, No. 61 of 2003;
- Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925)
- By-laws:
    - R363 of 2013: Regulations Relating to the Management of Human Remains
    - Local Authorities Notice 34 of 2017, Cemeteries, Crematoria and Funeral Undertakers By-Laws as per Provincial Gazette of 7 April 2017 No. 2800.

In terms of the National Heritage Resources Act, No. 25 of 1999, graves and burial grounds are divided into the following categories:
- Ancestral graves;
- Royal graves and graves of traditional leaders;
- Graves of victims of conflict;
- Graves of individuals designated by the Minister by notice in the Gazette;
- Historical graves and cemeteries; and
- Other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);

For KwaZulu-Natal, the KwaZulu-Natal Heritage Act No. 4 of 2008, graves and burial grounds are divided into the following categories:
- Clause 34: Clause 34 seeks to generally protect, against damage or alteration, graves of victims of conflict.
- Clause 35: Clause 35 seeks to generally protect, against damage or alteration, traditional burial places.

- Clause 40: Clause 40 seeks to give special protection to graves of members of the Royal Family listed in the schedule.

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

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

Marked graves younger than 60 years do not fall under the protection of the NHRA (Act No. 25 of 1999) with the result that exhumation, relocation and reburial can be conducted by a register undertaker. This will include logistical aspects such as social consultation, purchasing of plots in cemeteries, procurement of coffins, etc.

Marked graves older than 60 years are protected by the NHRA (Act No. 25 of 1999) an as a result an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. Unmarked graves are by default regarded as older than 60 years and therefore also falls under the NHRA (Act No. 25 of 1999, Section 36).

For graves in KwaZulu-Natal permission is required as follows:

- Clause 34: Approval of the Council must first be sought;
- Clause 35: Approval of the Council must first be sought;
- Clause 40: Nothing is stated in the Act.

3. Management Plan

3.1 *Definitions*

Heritage Site Management: Heritage site management is the control of the elements that make up physical and social environment of a site, its physical condition, land use, human visitors, interpretation, etc. Management may be aimed at preservation or, if necessary, at minimizing damage or destruction or at presentation of the site to the public. A site management plan is designed to retain the significance of the place. It ensures that the preservation, enhancement, presentation and maintenance of the place/site is deliberately and thoughtfully designed to protect the heritage values of the place (from: *SAHRA Site management plans: guidelines for the development of plans for the management of heritage sites or places*).

Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

3.2 *Heritage management plan (HMP)*

3.2.1 Phase 1: Site identification and verification

This part of the process usually take place during the Phase 1 heritage impact assessment and is discussed in Section 7 of the main body of the HIA.

Locality and identification:

- The location of the identified site (e.g. farm name, GPS coordinates) is given;

- Determination of the number of graves and the date range of the burials.

The physical condition of the site is also described in terms of:
- The condition of the burial grounds and graves, e.g. has the headstones been pushed over;
- The approximate number of graves and the date range of the graves;
- Is the site fenced off;
- Is there access to the site, in the case it is fenced off;
- Has the site recently been visited by next of kin or other individuals;
- The status of the vegetation cover on the site.

3.2.2 Phase 2: Determination of the potential impact on the identified sites

Identified impacts on the graves and burial sites are calculated and discussed in Section 8.1 of the main body of the HIA.

The second phase consists of information that should be collected in order to develop the conservation management plan. This includes:
- The needs of the client;
- External needs, i.e. the next of kin;
- Requirements for the maintenance of the cultural significance.

From the above an evaluation is made of the impact of the proposed development project on the status of each of the identified burial grounds and graves.

3.2.3 Phase 3: Mitigation measures

Proposed mitigation measures for each identified burial ground or graves are developed and is discussed in the main body of the HIA (Section 8.2).

The main aim of the mitigation measures, as far as is feasible, is to remove any physical, direct impacts on the burial grounds and graves.

- A minimum buffer of 20m must be established around known burial grounds and graves for the duration of the mining/construction phase. This is relevant where the burial site has been static for a considerable period of time and has already been fenced off;
- In cases the burial site is still in use and might expand in the future and is not fenced off, a minimum buffer of 100m should be implemented;
- In the case where blasting takes place during mining activities, the buffers should increase correspondingly to 200m;
- The buffers must be clearly demarcated, and signage placed during the construction/mining period;
- Access to the graves should be allowed to the descendants. However, they should adhere to the managing authorities' conditions regarding permissions, appointments, health, environment and safety.
- The areas with graves should be kept clean and the grass short so that visitors may enter it without any concerns.
    - However, this might create problems as in many cases not all graves are well-marked, carrying the possibility that they might inadvertently be damaged and therefore contractors/land-owners might not be will to accept this responsibility. The descendants should therefore be held responsible for the maintenance of the site.

- Sites that are located close to access/haul roads might need additional mitigation. All personnel and especially drivers of heavy haul vehicles should be informed where these sites are, and they should keep to the speed limits (usually 30km/h on mining sites);
- Any change in the development layout, future development plans, condition of the grave sites and individual graves should immediately be reported to the heritage inspector/SAHRA for guidance;
- Relevant strategies should be put in place for the managing of the burial grounds and graves after the closure of the mine or the completion of the project. It needs to be stated that the land-owner or developer always will be responsible for the preservation of the site. Therefore, measures should be put in place to ensure that the site is handled appropriately after closure, which, in essence would entail the continuation measures already put in place;

3.3 *Management strategy*

A general approach to this is set out in Section 9 of the main body of the HIA report and is equally applicable to general heritage sites and feature as well as to burial grounds and graves.

A strategy for the implementation of the conservation plan is developed:

- A heritage practitioner should be appointed to develop a heritage induction program and conduct training for the ECO, as well as team leaders, in the identification of heritage resources and artefacts;
- Known sites must be demarcated and fenced off and signage placed during the construction/mining period;
- This management strategy should be applicable to the construction, operation as well as the post operation phases of the development/mining activities.
- Relevant strategies should be put in place for the managing of the burial grounds and graves after the closure of the mine or the completion of the project. It needs to be stated that the land-owner or developer always will be responsible for the preservation of the site. Therefore, measures should be put in place to ensure that the site is handled appropriately after closure, which, in essence would entail the continuation measures already put in place;
- The managing authority should be able to regularly inspect the sites in order to ensure that construction and other such activities do not damage the graves;
    - SAHRA and the relevant PHRA are the competent authorities responsible for the regulation of the HMP in terms of the national legislative framework. The NHRA states:

        36(1) *Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make the necessary arrangement for their conservation as they see fit.*

4. Relocation of graves

Once it has been decided to relocate particular graves, the following steps should be taken:

- Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law.
- Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is a requirement by law.
- Local radio stations can also be used to try contact family members. This is not required by law, but is helpful in trying to contact family members.
- During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased.

- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account. This is a requirement by law.
- Once the 60 days has passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been received, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any items found in the grave.

Information needed for the SAHRA permit application:

- The permit application needs to be done by an archaeologist.
- A map of the area where the graves have been located.
- A survey report of the area prepared by an archaeologist.
- All the information on the families that have identified graves.
- If graves have not been identified and there are no headstones to indicate the grave, these are then unknown graves and should be handled as if they are older than 60 years. This information also needs to be given to SAHRA.
- A letter from the landowner giving permission to the developer to exhume and relocate the graves.
- A letter from the new cemetery confirming that the graves will be reburied there.
- Details of the farm name and number, magisterial district and GPS coordinates of the gravesite.

5. Defining next of kin

An extensive Burial Grounds and Graves Consultation process must be implemented in accordance with NHRA Regulations to identify bona fide next of kin and reach agreement regarding relocation of graves.

Anthropologically speaking three type of kin are distinguished: patrilineal (called *agnates*), maternal (*uterine* kin) and kin by marriage (*affines*). All three categories have their important part to play in social life.

In terminologies used in the west the close-knit group of family members is clearly marked off from other kin - family terms, such as 'father', 'mother', 'brother' and 'sister' are never used for aunts, uncles and cousins.

In many non-western societies this is not the case and the family is merged with the wider group of kin and the family terms are applied much more widely. Next of kin for the Southern Bantu-language speakers is based on a classificatory system where a man uses a term to refer to three significant relatives – his father, his father's brother and his mother's brother.

For example, a man (A) may call his father's brother (i.e. uncle) also a father. All of that latter person's children will then also be called his (A) brothers and sisters, prohibiting him from marrying any of them (however, *vide* preferred marriages). In Anthropology this system is referred to as the Iroquois system (with reference to the North American Indian tribe where it was first described). When a man calls his father's brother 'father' a suffix is usually added to indicate whether he is an elder or junior brother (e.g. (*ra)mogolo* = elder brother; (*ra)ngwane* = junior brother; also (*ra)kgadi* = younger sister; (*ma)lome* = mother's brother)(SePedi terminology is used).

Consultants having to relocate graves might find it confusing if they do not have insight into this complex system of kinship, where, for example a single individual can have more than one father or mother.

5. Chance find procedures

A general approach to this is set out in Section 9 of the main body of the HIA report and is equally applicable to general heritage sites and features as to burial grounds and graves.

- A heritage practitioner should be appointed to develop a heritage induction program and conduct training for the ECO, as well as team leaders, in the identification of heritage resources and artefacts;
- An appropriately qualified heritage consultant should be identified to be called upon if any possible heritage resources or artefacts are identified;
- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities be halted;
- The qualified archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and impact on the heritage resource;
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the material and data are recovered;
- Should the heritage consultant conclude that the find is a heritage resource protected in terms of the NHRA (1999) Sections 34, 35, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), he or she should notify SAHRA and/or the relevant PHRA;
- Based on the comments received from SAHRA and/or the PHRA, the heritage consultant would present the relevant terms of reference to the client for implementation;
- Construction/Operational activities can commence as soon as the site has been cleared and signed off by the archaeologist.

6. Curriculum vitae

Johan Abraham van Schalkwyk

Personal particulars

Date of birth:	14 April 1952
Identity number:	520414 5099 08 4
Marital status:	Married; one daughter
Nationality:	South African

Current address: home

62 Coetzer Ave, Monument Park, Pretoria, 0181
Mobile: 076 790 6777; E-mail: jvschalkwyk@mweb.co.za

Qualifications

1995 DLitt et Phil (Anthropology), University of South Africa
1985 MA (Anthropology), University of Pretoria
1981 BA (Hons), Anthropology, University of Pretoria
1979 Post Graduate Diploma in Museology, University of Pretoria
1978 BA (Hons), Archaeology, University of Pretoria
1976 BA, University of Pretoria

Non-academic qualifications

12th HSRC-School in Research Methodology - July 1990
Dept. of Education and Training Management Course - June 1992
Social Assessment Professional Development Course - 1994
Integrated Environmental Management Course, UCT - 1994

Professional experience

Private Practice
2017 - current: Professional Heritage Consultant

National Museum of Cultural History
1992 - 2017: Senior researcher: Head of Department of Research. Manage an average of seven researchers in this department and supervise them in their research projects. Did various projects relating to Anthropology and Archaeology in Limpopo Province, Mpumalanga, North West Province and Gauteng. Headed the Museum's Section for Heritage Impact Assessments.
1978 - 1991: Curator of the Anthropological Department of the Museum. Carried out extensive fieldwork in both anthropology and archaeology

Department of Archaeology, University of Pretoria
1976 - 1977: Assistant researcher responsible for excavations at various sites in Limpopo Province and Mpumalanga.

Awards and grants

1. Hanisch Book Prize for the best final year Archaeology student, University of Pretoria - 1976.
2. Special merit award, National Cultural History Museum - 1986.
3. Special merit award, National Cultural History Museum - 1991.
4. Grant by the Department of Arts, Culture, Science and Technology, to visit the various African countries to study museums, sites and cultural programmes - 1993.
5. Grant by the USA National Parks Service, to visit the United States of America to study museums, sites, tourism development, cultural programmes and impact assessment programmes - 1998.
6. Grant by the USA embassy, Pretoria, under the Bi-national Commission Exchange Support Fund, to visit cultural institutions in the USA and to attend a conference in Charleston - 2000.
7. Grant by the National Research Foundation to develop a model for community-based tourism - 2001.

8. Grant by the National Research Foundation to develop a model for community-based tourism - 2013. In association with RARI, Wits University.

Publications
Published more than 70 papers, mostly in scientifically accredited journals, but also as chapters in books.

Conference Contributions
Regularly presented papers at conferences, locally as well as internationally, on various research topics, ranging in scope from archaeology, anthropological, historical, cultural historical and tourism development.

Heritage Impact Assessments
Since 1992, I have done more than 2000 Phase 1 and Phase 2 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, roads, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.

Latest publications
Van Schalkwyk, J.A. 2020. A cognitive approach to ordering of the world: some case studies from the Sotho- and Tswana-speaking people of South Africa. In Whitley, D.S., Loubser, J.H.N. & Whitelaw, G. (eds.) *Cognitive Archaeology. Mind, Ethnography, and the Past in South African and Beyond*. London: Routledge. Pp. 184-200.

Namono, C. & Van Schalkwyk, J.A. 2020. Appropriating colonial dress in the rock art of the Makgabeng plateau, South Africa. In Wingfield, C., Giblin, J. & King, R. (eds) *The pasts and presence of art in South Africa: Technologies, Ontologies and Agents*. University of Cambridge: McDonald Institute for Archaeological Research. Pp. 51-62.

Appendix C4:
Palaeontology

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Proposed amendment of the authorised grid connection between the renewable energy Project DAO and the existing Garona Substation near Groblershoop, Northern Cape Province

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	NATURA VIVA CC			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100
Specialist name:	Dr John Edward Almond			
Specialist Qualifications:	PhD (palaeontology)			
Professional affiliation/registration:	Palaeontolgical Society of Southern Africa, Association of Professional Heritage Practitioners (W Cape)			
Physical address:	76 Breda Park, Breda Street, Oranjezicht, CAPE TOWN			
Postal address:	PO Box 12410 Mill Street, Cape Town			
Postal code:	8010	Cell:	n/a	
Telephone:	021 462 3622	Fax:	n/a	
E-mail:	naturaviva@universe.co.za			

2. DECLARATION BY THE SPECIALIST

I, **Dr John Edward Almond**, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

NATURA VIVA CC

Name of Company

1 July 2021

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Dr John Edward Almond**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

John E Almond

Signature of the Specialist

NATURA VIVA CC

Name of Company

1 July 2021

Date

Signature of the Commissioner of Oaths

2021-07-01

Date

SOUTH AFRICAN POLICE SERVICE
STATION COMMANDER
CAPE TOWN
01 JUL 2021
CAPE TOWN
STATION COMMANDER
SOUTH AFRICAN POLICE SERVICE

NATURA VIVA cc
Palaeontological Impact Assessments & Heritage Management, Natural History Education, Tourism, Research

Attn: Ms Lusani Madali
Acwa Power
7th Floor
90 Grayston Drive
Sandton 2196
South Africa
E-mail: LRathanya@acwapower.com

26 June 2021

ADDENDUM

Proposed amendment of the authorised grid connection between the renewable energy Project DAO and the existing Garona Substation near Groblershoop, Northern Cape Province

1. Background

This letter serves as an Addendum to the Palaeontological Heritage Assessment for the Bokpoort Solar Power Facility on the Remaining Extent of Farm Bokpoort 390 near Groblershoop, Northern Cape Province submitted by the author (Almond 2020a) and to the subsequent Part 2 Amendment comment (Almond 2020b). The solar facility comprises seven sites and is now known as Project DAO.

2. Purpose of the EA Process

ACWA Power Project DAO (RF) Pty Ltd, on behalf of Eskom, is undertaking an EIA process for the expansion of the existing 400kV Garona Substation and the installation of a single 400 kV loop-in loop out power line to enable the authorised Project DAO to connect to the national grid (*N.B.* The previously authorised and assessed layout envisaged a total of 10 x 132 kV power lines).

3. Project Description

The proposed scope of work for the amended grid connection includes:

a) Upstream scope of work at Garona Substation:
   - Establish a 400 kV busbar at Garona Substation;
   - Establish and equip 2 x 400 kV feeder bays, and
   - Loop in (FER/GAR 356-360) and out (GAR/NIE 1-3) of Ferrum -Nieuwehoop 400 kV lines (approx. 2 x 1 km) into Garona Substation.

b) Shared scope of work at Garona Substation (expansion of the substation):
   - Extend the 132 kV busbar at Garona Substation (to accommodate the 400/132 kV transformer);

- Install a 500 MVA 400/132kV transformer with associated transformer bays, and
- Provide space for 1 future 400/132 kV transformer.

c) Dedicated scope of work at Garona Substation:
   - Equip and commission the 1x 132 kV feeder bay.

4. Conclusion and Recommendations

With regard to the proposed amended grid connection of the authorised Project DAO, there is no (zero) change to the assessed significance rating compared with the original Environmental Impact Assessment (EIA) Palaeontological Heritage report and no additional impacts on palaeontological heritage are envisaged. Furthermore, no new mitigation measures are required.

The proposed amendment is expected to have a neutral effect from a palaeontological heritage impact perspective *i.e.* no advantages or disadvantages are expected.

There are no objections on palaeontological heritage grounds to approval of the proposed amendment, subject to the conditions and recommendations as stipulated in the original Environmental Authorisation, and according to the Environmental Management Programme and suggested mitigation measures, as outlined in the original Palaeontological Heritage Assessment report (Almond 2020a).

Please feel free to contact me at any time, should you have any queries.

Yours faithfully,

John E. Almond

Dr John E. Almond
(Palaeontologist)
***Natura Viva* cc**

REFERENCES

ALMOND, J.E. 2020a. Proposed Bokpoort II Solar Power Facility on the Remaining Extent of Farm Bokpoort 390 near Groblershoop, Northern Cape Province. Palaeontological impact assessment: desktop study, 17 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2020a. Part 2 Amendment Process for the Development of Eight 200MW PV Plants on the Farm Bokpoort in the Northern Cape Province. Palaeontological heritage comment, 3 pp. Natura Viva cc, Cape Town.

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Proposed Bokpoort II Solar Power Facility on the Remaining Extent of Farm Bokpoort 390 near Groblershoop, Northern Cape Province

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
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3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	NATURA VIVA CC			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100
Specialist name:	Dr John Edward Almond			
Specialist Qualifications:	PhD (Palaeontology), University of Cambridge, UK			
Professional affiliation/registration:	Palaeontological Society of Southern Africa, Association of Professional Heritage Practitioners (W Cape)			
Physical address:	76 Breda Park, Breda St, Oranjezicjt, CAPE TOWN 8001, RSA			
Postal address:	PO Box 12410 Mill Street, CAPE TOWN			
Postal code:	8010	Cell:		
Telephone:	021 462 3622	Fax:		
E-mail:	naturaviva@universe.co.za			

2. DECLARATION BY THE SPECIALIST

I, **Dr John Edward Almond**, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

John E Almond

Signature of the Specialist

NATURA VIVA CC

Name of Company

1/31/2020

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Dr John Edward Almond**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

John E Almond

Signature of the Specialist

NATURA VIVA CC

Name of Company

1/3/2020

Date

7488124-7

Signature of the Commissioner of Oaths

2020-03-01

Date

SOUTH AFRICAN POLICE SERVICE
STATION COMMANDER
CAPE TOWN

2020 -03- 01

CAPE TOWN
STATION COMMANDER
SOUTH AFRICAN POLICE SERVICE

PALAEONTOLOGICAL IMPACT ASSESSMENT: DESKTOP STUDY

Proposed Bokpoort II Solar Power Facility on the Remaining Extent of Farm Bokpoort 390 near Groblershoop, Northern Cape Province

John E. Almond PhD (Cantab.)
***Natura Viva* cc,**
PO Box 12410 Mill Street,
Cape Town 8010, RSA
naturaviva@universe.co.za

February 2020

1. EXECUTIVE SUMMARY

ACWA Power Energy Africa (Pty) Ltd is proposing to develop the Bokpoort II Solar Power Facility on the Remaining Extent (RE) of the Farm Bokpoort 390 near Groblershoop, Northern Cape. An associated, authorised water pipeline to the Orange River running along an existing servitude will also traverse the adjoining Farm Sand Draai 391. The combined power generation capacity of the Bokpoort II solar development will be up to 2000 MW that will be generated by ten x 200 MW photovoltaic (PV) facilities, two of which have already been authorised but are undergoing another Basic Assessment (BA) study for the battery storage energy system as well as the capacity increase from 75 to 200MW. The total size of the Bokpoort II Solar Power Facility is approximately 1 500 ha.

The proposed alternative energy developments are underlain by highly metamorphosed Precambrian basement rocks (schists, quartzites, gneisses) of the Namaqua-Natal Province that are entirely unfossiliferous. These are largely mantled by Late Caenozoic superficial sediments including Quaternary aeolian sands of the Gordonia Formation (Kalahari Group), calcrete pedocretes (soil limestones) and alluvium of the Orange River and its tributaries. These younger superficial sediments are generally of low palaeontological sensitivity. Potentially fossiliferous older alluvial gravels are not mapped along the banks of the Orange River close to Groblershoop where these are intersected by the proposed water pipeline.

No significant fossil heritage resources have been recorded within the Bokpoort II Solar Power Facility study area. The area is inferred to be of low sensitivity in terms of palaeontological heritage and no sensitive or no-go areas have been identified within it during the present desktop assessment. The proposed solar power facility is of LOW (negative) impact significance with respect to palaeontological heritage resources. This assessment applies to all the planned infrastructure within the project area – *including* the water pipeline to the Orange River (already authorised) as well as the short 132 kV overhead line connection to the existing Eskom Garona Substation - and applies equally to all PV plants under consideration for the Bokpoort II Solar Power Facility. Cumulative impacts associated with the ten alternative energy developments are probably low and there are no fatal flaws in the development proposal as far as fossil heritage is concerned. The no-go alternative is of neutral significance for palaeontology. Providing that the recommendations outlined below for palaeontological monitoring and mitigation are fully implemented, there are no objections on palaeontological heritage grounds to authorisation of this alternative energy project. Pending the potential discovery of significant new fossil remains during development - notably fossil vertebrate bones & teeth - no further specialist palaeontological studies or mitigation are considered necessary for this project.

In the case of any significant chance fossil finds during construction (*e.g.* vertebrate teeth, bones, burrows, petrified wood, shells), these should be safeguarded - preferably *in situ* - and reported by the ECO as soon as possible to the South African Heritage Resources Agency, SAHRA (Contact

details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). This is so that appropriate mitigation by a professional palaeontologist can be considered. Such mitigation usually involves the judicious sampling, collection and recording of fossils as well as of relevant contextual data concerning the surrounding sedimentary matrix. The palaeontologist concerned would need to apply beforehand for a collection permit from SAHRA. A tabulated Chance Fossil Finds Procedure is appended to this report.

These recommendations should be incorporated into the Environmental Management Plan (EMP) for all the Bokpoort II alternative energy developments.

2. INTRODUCTION & BRIEF

The company ACWA Power Energy Africa (Pty) Ltd is proposing to develop a solar power facility – to be known as Bokpoort II - on the Remaining Extent (RE) of the Farm Bokpoort 390. An associated water pipeline to the Orange River running along an existing servitude will also traverse the adjoining Farm Sand Draai 391. The Bokpoort II project area is situated *c*. 20 km north of the town of Groblershoop within the !Kheis Local Municipality in the ZF Mgcawu District Municipality, Northern Cape Province (Fig. 1). In 2016 ACWA Power obtained three Environmental Authorisations (EAs) for two 75 MW PV facilities as well as a 150 MW CSP facility on the property. The water main pipeline to the Orange has also already been authorised. However, it is now being proposed that, instead of the CSP facility, eight additional PV plants are developed within the same footprint. The two authorised PV facilities are undergoing another BA study for the battery storage energy system as well as the capacity increase from 75 to 200MW. The combined power generation capacity of the entire Bokpoort II solar development will be up to 2000 MW that will be generated by ten x 200 MW photovoltaic (PV) facilities.

Each of the eight proposed additional 200 Megawatt (MW) Photovoltaic (PV) Solar Developments will cover approximately 150 hectares and will comprise the following infrastructure:

- Solar PV modules that will be able to deliver up to 200 MW to the Eskom National Grid;
- Inverters that convert direct current (DC) generated by the PV modules into alternating current (AC) to be exported to the electrical grid;
- A transformer that raises the system AC low voltage (LV) to medium voltage (MV). The transformer converts the voltage of the electricity generated by the PV panels to the correct voltage for delivery to Eskom;
- Transformer substation; and
- Instrumentation and Control consisting of hardware and software for remote plant monitoring and operation of the facility.

Associated infrastructure (Figs. 2 & 3) includes:

- Mounting structures for the solar panels;
- Cabling between the structures, to be lain underground where practical;
- A new 132kV overhead powerline which will connect the facility to the National Grid via Eskom's existing Garona Substation. The powerlines vary in length and will be located within a servitude spanning 15.5m meters on both sides. The powerline towers will be 35m high;
- Battery Energy Storage System (BESS) - battery Power at Point of Connection: 150MW, area required: 16ha; the BESS will store approximately 4500m^3 of hazardous substance.;
- Internal access roads (4 – 6 m wide roads will be constructed but existing roads will be used as far as possible) and fencing (approximately 3 m in height); and
- Shared infrastructure consisting of buildings, including a workshop area for maintenance, storage (i.e. fuel tanks, etc.), laydown area, parking, warehouse, and offices (previously approved).

Since fossils preserved within the sedimentary rocks represented within the project area might be disturbed, damaged or destroyed during the construction phase of the proposed Bokpoort II development (*e.g.* during excavations or surface clearance) a desktop palaeontological heritage assessment was originally requested for this development by SAHRA (Case IDs 9659, 9699 and 9702; three letters of 27 June 2016). The present palaeontological heritage desktop study covering the entire Bokpoort II project area has accordingly been commissioned on the proponent's behalf by Royal HaskoningDHV (Pty) Ltd, Woodmead, Gauteng. The present palaeontological report contributes to a Basic Assessment process that covers:

- Eight additional 200 MW PV developments on the originally authorised CSP site.
- Two BESS sites to be included within the footprint of the approved PV 1 (Ndebele) and PV 2 (Xhosa) plants with a combined dangerous good storage volume of approximately 4500 m^3 for each additional BESS site as well as the capacity increase up to 200MW.

It is noted that:

(1) Two PV plants of 75 MW each (*i.e.* Ndebele and Xhosa) have already been authorised. These two PV plants will be subject to their own BA, for the proposed new BESS sites and capacity upgrade from 75 to 200MW. Basic Assessment processes for each of the proposed PV plants are being co-ordinated by Royal HaskoningDHV (Pty) Ltd. (Contact details: Ms Seshni Govender. Royal HaskoningDHV (Pty) Ltd. Address: Building No. 5 Country Club Estate, 21 Woodlands Drive, Woodmead, 2191. PO Box 867, Gallo Manor, 2052, Gauteng, South Africa. Tel: 087 352 1592. Mobile: 072 442 0086. E-mail: seshni.govender@rhdhv.com).

(2) The Bokpoort II site is within one of South Africa's eight Renewable Energy Development Zones (RED7 Upington area *cf* Heritage review by Fourie *et al.* 2014), and has therefore been identified as one of the most suitable areas in the country for renewable energy development, in terms of a number of environmental impact, economic and infrastructural factors.

2.1. Legislative context for palaeontological assessment studies

The present desktop palaeontological heritage report falls under Sections 35 and 38 (Heritage Resources Management) of the South African Heritage Resources Act (Act No. 25 of 1999), and it will also inform the Environmental Management Programme for this project.

The various categories of heritage resources recognised as part of the National Estate in Section 3 of the National Heritage Resources Act include, among others:

- geological sites of scientific or cultural importance;
- palaeontological sites;
- palaeontological objects and material, meteorites and rare geological specimens.

According to Section 35 of the National Heritage Resources Act, dealing with archaeology, palaeontology and meteorites:

(1) The protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources Agency.

(2) All archaeological objects, palaeontological material and meteorites are the property of the State.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources Agency, or to the nearest local Agency offices or museum, which must immediately notify such heritage resources Agency.

(4) No person may, without a permit issued by the responsible heritage resources Agency—

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

(5) When the responsible heritage resources Agency has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may—

(a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;

(b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;

(c) if mitigation is deemed by the heritage resources Agency to be necessary, assist the person on whom the order has been served under paragraph *(a)* to apply for a permit as required in subsection (4); and

(d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

Minimum standards for the palaeontological component of heritage impact assessment reports (PIAs) have been published by SAHRA (2013).

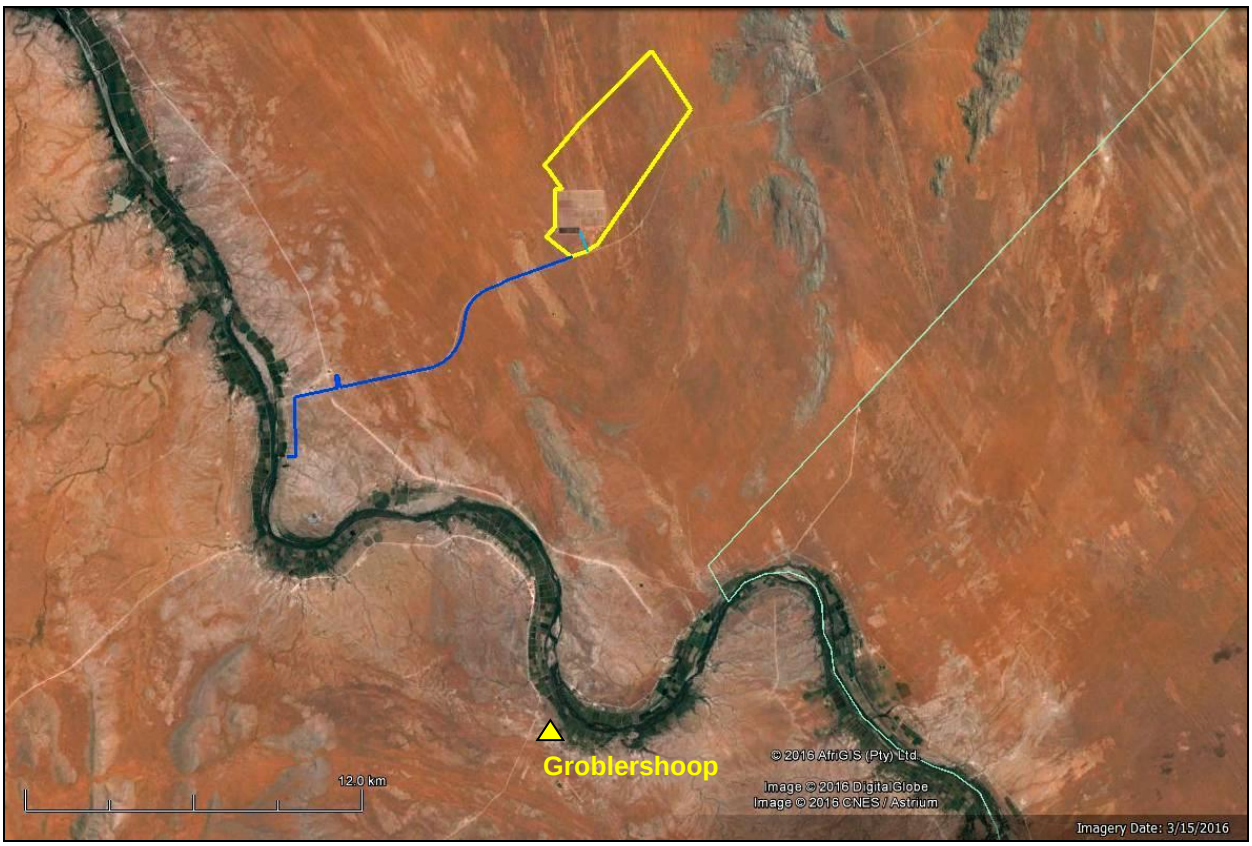

Figure 1: Google earth© satellite image showing the location of the Bokpoort II Solar Power Facility project area (yellow polygon) situated *c*. 20 km north of Groblershoop, Gordonia District, Northern Cape. The associated water pipeline to the Orange River (already authorised) is indicated by the blue line. N is towards the top of the image. Scale bar = 12 km.

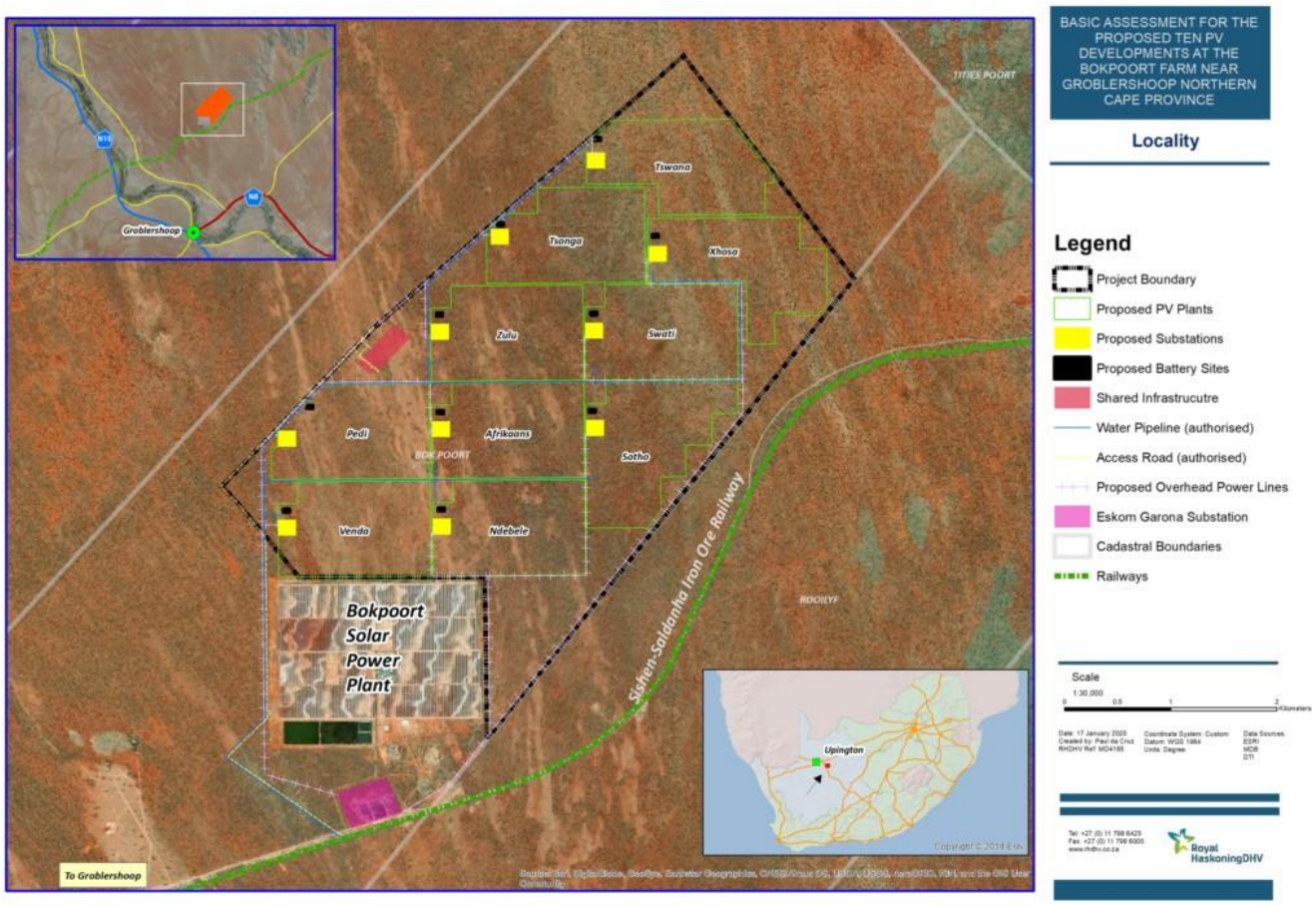

Figure 2: Google earth© satellite image of the Bokpoort II Solar Power Facility project area on the Remaining Extent (RE) of the Farm Bokpoort 390. Shown here are the project boundary (black dashed lines), 10 x PV plants (green) each with a battery site (black) and on-site substation (yellow), the existing Eskom Garona Substation (lilac), main access road (yellow) and shared infrastructure (red). The cleared area for the existing Bokpoort Solar Power Plant can be clearly seen.

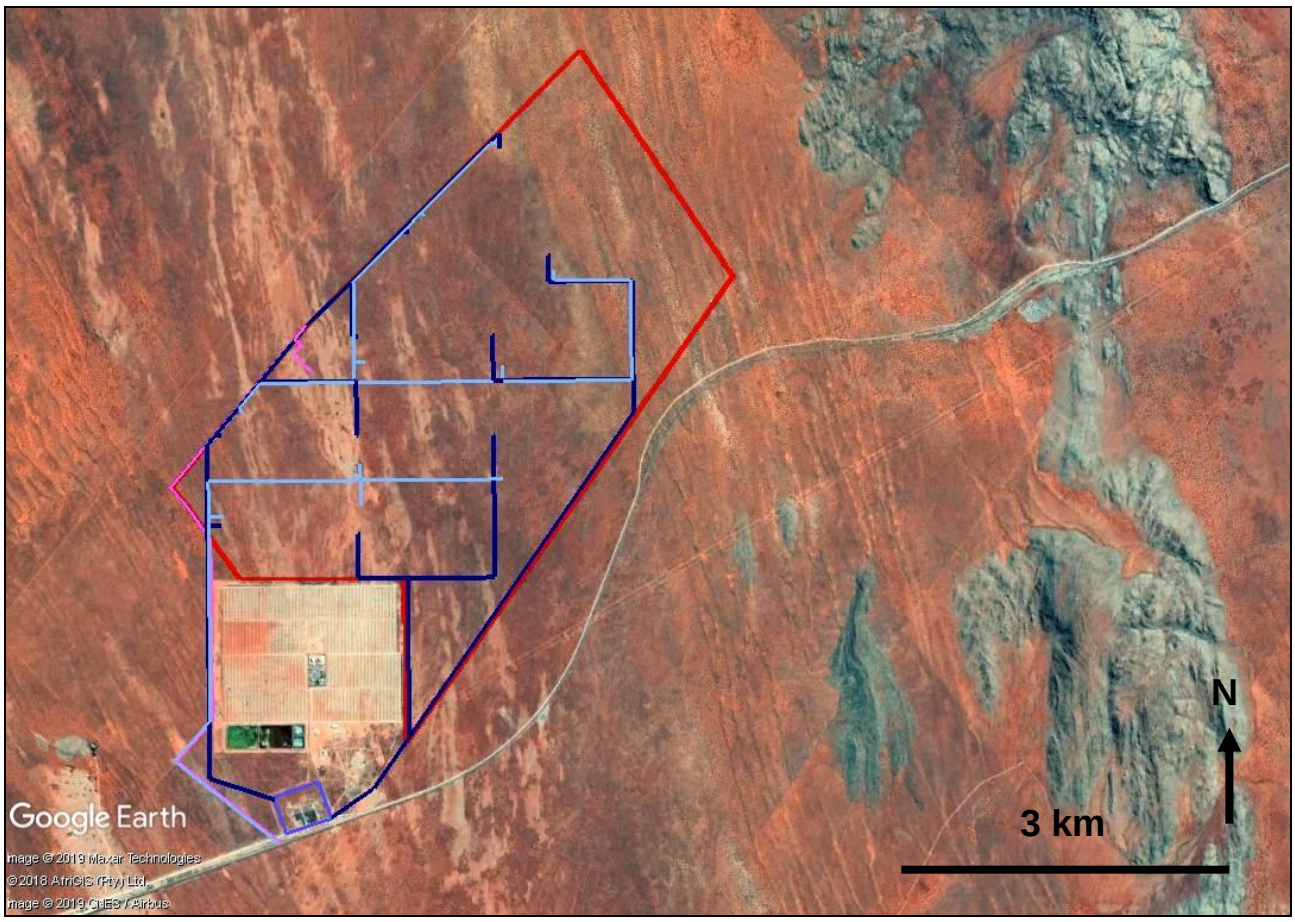

Figure 3: Google earth© satellite image of the Bokpoort II Solar Power Facility project area on the Remaining Extent (RE) of the Farm Bokpoort 390. Shown here are the project boundary (red), overhead powerlines (dark blue), water pipelines, main access road (pink) and the existing Eskom Garona Substation (lilac).

2.2. General approach used for this palaeontological impact study

This PIA report provides an assessment of the observed or inferred palaeontological heritage within the broader study area, with recommendations for specialist palaeontological mitigation where this is considered necessary. The report is based on (1) a review of the relevant scientific literature, including previous palaeontological impact assessments in the area (*e.g.* Almond 2012, 2013a, 2013b, Bamford 2016), (2) published geological maps and accompanying sheet explanations (*e.g.* Moen 2007), as well as (3) the author's extensive field experience with the formations concerned and their palaeontological heritage (*e.g.* Almond & Pether 2008).

In preparing a palaeontological desktop study the potentially fossiliferous rock units (groups, formations *etc*) represented within the study area are determined from geological maps and satellite images. The known fossil heritage within each rock unit is inventoried from the published scientific literature, previous palaeontological impact studies in the same region, and the author's field experience (Consultation with professional colleagues as well as examination of institutional fossil collections may play a role here, or later following scoping during the compilation of the final report). This data is then used to assess the palaeontological sensitivity of each rock unit to development (Provisional tabulations of palaeontological sensitivity of all formations in the Western, Eastern and Northern Cape have already been compiled by J. Almond and colleagues; *e.g.* Almond & Pether 2008). The likely impact of the proposed development on local fossil heritage is then determined on the basis of (1) the palaeontological sensitivity of the rock units concerned and (2) the nature and scale of the development itself, most notably the extent of fresh bedrock excavation envisaged. When rock units of moderate to high palaeontological sensitivity

are present within the development footprint, a field assessment study by a professional palaeontologist is usually warranted.

The focus of palaeontological field assessment is *not* simply to survey the development footprint or even the development area as a whole (*e.g.* farms or other parcels of land concerned in the development). Rather, the palaeontologist seeks to assess or predict the diversity, density and distribution of fossils within and beneath the study area, as well as their heritage or scientific interest. This is primarily achieved through a careful field examination of one or more representative exposures of all the sedimentary rock units present (*N.B.* Metamorphic and igneous rocks rarely contain fossils). The best rock exposures are generally those that are easily accessible, extensive, fresh (*i.e.* unweathered) and include a large fraction of the stratigraphic unit concerned (*e.g.* formation). These exposures may be natural or artificial and include, for example, rocky outcrops in stream or river banks, cliffs, quarries, dams, dongas, open building excavations or road and railway cuttings. Uncemented superficial deposits, such as alluvium, scree or wind-blown sands, may occasionally contain fossils and should also be included in the field study where they are well-represented in the study area. It is normal practice for impact palaeontologists to collect representative, well-localized (*e.g.* GPS and stratigraphic data) samples of fossil material during field assessment studies. In order to do so, a fossil collection permit from SAHRA is required and all fossil material collected must be properly curated within an approved repository (usually a museum or university collection).

Note that while fossil localities recorded during field work within the study area itself are obviously highly relevant, most fossil heritage here is embedded within rocks beneath the land surface or obscured by surface deposits (soil, alluvium *etc*) and by vegetation cover. In many cases where levels of fresh (*i.e.* unweathered) bedrock exposure are low, the hidden fossil resources have to be *inferred* from palaeontological observations made from better exposures of the same formations elsewhere in the region but outside the immediate study area. Therefore a palaeontologist might reasonably spend far *more* time examining road cuts and borrow pits close to, but outside, the study area than within the study area itself. Field data from localities even further afield (*e.g.* an adjacent province) may also be adduced to build up a realistic picture of the likely fossil heritage within the study area.

On the basis of the desktop and field studies, the likely impact of the proposed development on local fossil heritage and any need for specialist mitigation are then determined. Adverse palaeontological impacts normally occur during the construction rather than the operational or decommissioning phase. Mitigation by a professional palaeontologist – normally involving the recording and sampling of fossil material and associated geological information (*e.g.* sedimentological and taphonomic data) – is usually most effective during the construction phase when fresh fossiliferous bedrock has been exposed by excavations. To carry out mitigation, the palaeontologist involved will need to apply for a palaeontological collection permit from the relevant heritage management Agency, *i.e.* the South African Heritage Resources Agency, SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). It should be emphasized that, *providing appropriate mitigation is carried out*, the majority of developments involving bedrock excavation can make a *positive* contribution to our understanding of local palaeontological heritage.

2.3. Assumptions and limitations

The accuracy and reliability of palaeontological specialist studies as components of heritage impact assessments are generally limited by the following constraints:

1. Inadequate database for fossil heritage for much of the RSA, given the large size of the country and the small number of professional palaeontologists carrying out fieldwork here. Most development study areas have never been surveyed by a palaeontologist.

2. Variable accuracy of geological maps which underpin these desktop studies. For large areas of terrain these maps are largely based on aerial photographs alone, without ground-truthing. The maps generally depict only significant ("mappable") bedrock units as well as major areas of superficial "drift" deposits (alluvium, colluvium) but for most regions give little or no idea of the level of bedrock outcrop, depth of superficial cover (soil *etc*), degree of bedrock weathering or levels of small-scale tectonic deformation, such as cleavage. All of these factors may have a major influence on the impact significance of a given development on fossil heritage and can only be reliably assessed in the field.

3. Inadequate sheet explanations for geological maps, with little or no attention paid to palaeontological issues in many cases, including poor locality information.

4. The extensive relevant palaeontological "grey literature" - in the form of unpublished university theses, impact studies and other reports (*e.g.* of commercial mining companies) - that is not readily available for desktop studies.

5. Absence of a comprehensive computerized database of fossil collections in major RSA institutions which can be consulted for impact studies. A Karoo fossil vertebrate database is now accessible for impact study work.

In the case of palaeontological desktop studies without supporting Phase 1 field assessments these limitations may variously lead to either:

(a) *underestimation* of the palaeontological significance of a given study area due to ignorance of significant recorded or unrecorded fossils preserved there, or

(b) *overestimation* of the palaeontological sensitivity of a study area, for example when originally rich fossil assemblages inferred from geological maps have in fact been destroyed by tectonism or weathering, or are buried beneath a thick mantle of unfossiliferous "drift" (soil, alluvium *etc*).

Since most areas of the RSA have not been studied palaeontologically, a palaeontological desktop study usually entails *inferring* the presence of buried fossil heritage within the study area from relevant fossil data collected from similar or the same rock units elsewhere, sometimes at localities far away. Where substantial exposures of bedrocks or potentially fossiliferous superficial sediments are present in the study area, the reliability of a palaeontological impact assessment may be significantly enhanced through field assessment by a professional palaeontologist.

In the case of the present study area near Groblershoop in the Northern Cape preservation of potentially fossiliferous bedrocks is favoured by the arid climate but bedrock exposure is very limited indeed due to cover by extensive superficial deposits (*e.g.* alluvium, sandy soils, surface gravels), especially in areas of low relief, as well as by Kalahari vegetation. Very few previous palaeontological heritage assessments have been carried out in the study region (*cf* SAHRIS website; Bamford 2016).

3. GEOLOGICAL CONTEXT

The Bokpoort II Solar Power Facility study area on the Remaining Extent (RE) of the Farm Bokpoort 390 comprises arid, low relief terrain in the Gordonia region on the north-eastern side of the Orange River some 20 km north of Groblershoop, Northern Cape (Fig. 1). The terrain within the solar facility study area slopes broadly southwards from *c*. 1010 m amsl in the north to c. 950 m amsl in the south. As clearly seen in satellite images (Figs. 1 to 3) bedrock exposure is good close to the river and along some sectors of the river bank, while away from the river the bedrocks are largely mantled with orange-brown Kalahari sands. NNW to SSE trending linear sand dunes here surround occasional emergent rocky Inselberge of basement rocks. Bedrock exposures in the vicinity are dissected by the dendritic drainage courses of small, intermittently-flowing streams.

The geology of the study area near Groblershoop is shown on the adjoining 1: 250 000 geological maps 2820 Upington and 2822 Postmasburg (Council for Geoscience, Pretoria; Fig. 4 herein). A comprehensive sheet explanation for the Upington map has been published by Moen (2007) while only a very brief explanation for the Postmasburg area is printed on the map itself. The entire study area is underlain at depth by ancient Precambrian igneous and metamorphic rocks that belong to the **Namaqua-Natal Province** of Mid Proterozoic (Mokolian) age (Cornell *et al.* 2006, Moen 2007). These metamorphosed basement rocks are approximately two to one billion years old and are entirely unfossiliferous (Almond & Pether 2008); they are only represented at surface by small bouldery outcrops (*cf* Dreyer 2015). They include a range of schistose and quartzitic units assigned to the **Brulpan Group** (*e.g.* **Groblershoop Formation** and **Prynnsburg Formation**), details of which are given by Moen (2007) as well as Cornell *et al.* (2006). Outside the present study area the Brulpan rocks are locally intruded by the **Kalkwerf Granite-gniess**, likewise unfossiliferous.

The Precambrian basement rocks within the study area are to a great extent mantled with a spectrum of coarse- to fine-grained **superficial deposits** such as rocky soils, downwasted surface gravels, colluvium (slope deposits), sheet wash, calcrete hardpans, aeolian sands and alluvium of intermittently-flowing streams. These younger deposits are generally young (Quaternary to Recent) and are largely unfossiliferous. Field photos of the study area (*e.g.* Dreyer 2015) show orange-brown Kalahari sands, exhumed calcrete hardpans and dispersed, surface gravels dominated by reworked or downwasted calcrete with minor basement quartzite and cherty clasts (these last probably derived from alluvial gravels of the Orange River).

Small patches of Late Tertiary to Quaternary **calcretes** or pedogenic limestones (T, darker yellow in Fig. 4) are mapped between the solar facility study area and the Orange River; some of these are traversed by the water pipeline servitude. Some of these calcretes may be correlated with the Pleistocene or Late Pliocene **Mokalanen Formation** of the **Kalahari Group**, while others may be of younger age (Partridge *et al.* 2006, Moen 2007). They include horizons of layered to structureless or nodular calcretes overlying basement rocks that are usually less than 3 m thick and often partially covered by wind-blown sands.

The great majority of the study area, including the water pipeline corridor, is covered by fine-grained aeolian (wind-blown) sands of the **Gordonia Formation** (**Qg**, pale yellow in Fig. 4), the youngest, Pleistocene to Recent, subunit of the Kalahari Group. Prominent NNW-SSE trending linear dunes of orange-hued sands are clearly visible on satellite images of the study area (Figs. 1 to 3). The geology of the Late Cretaceous to Recent Kalahari Group is reviewed by Thomas (1981), Dingle *et al.* (1983), Thomas & Shaw 1991, Haddon (2000) and Partridge *et al.* (2006). The Gordonia dune sands are considered to range in age from the Late Pliocene / Early Pleistocene to Recent, dated in part from enclosed Middle to Later Stone Age stone tools (Dingle *et al*., 1983, p. 291). Note that the recent extension of the Pliocene - Pleistocene boundary from 1.8 Ma back to 2.588 Ma would place the Gordonia Formation almost entirely within the Pleistocene Epoch.

According to Moen (2007) **older river terrace gravels** of possible Late Tertiary to Pleistocene age occur “all along the [Orange] river” within 2 km of the present banks and at elevations of up to 45 m (rarely as high as 85m) above the present flood plain. These older river gravels are frequently calcretised. Small patches of older terrace gravels are mapped along the eastern banks of the River Orange some 25 km north of Groblershoop but they are not indicated within the present study area. They may either be completely absent here or too small to map at 1: 250 000 scale. Field photos of the river bank where this is intersected by the existing pipeline show the presence here of disturbed, fine-grained younger alluvium.

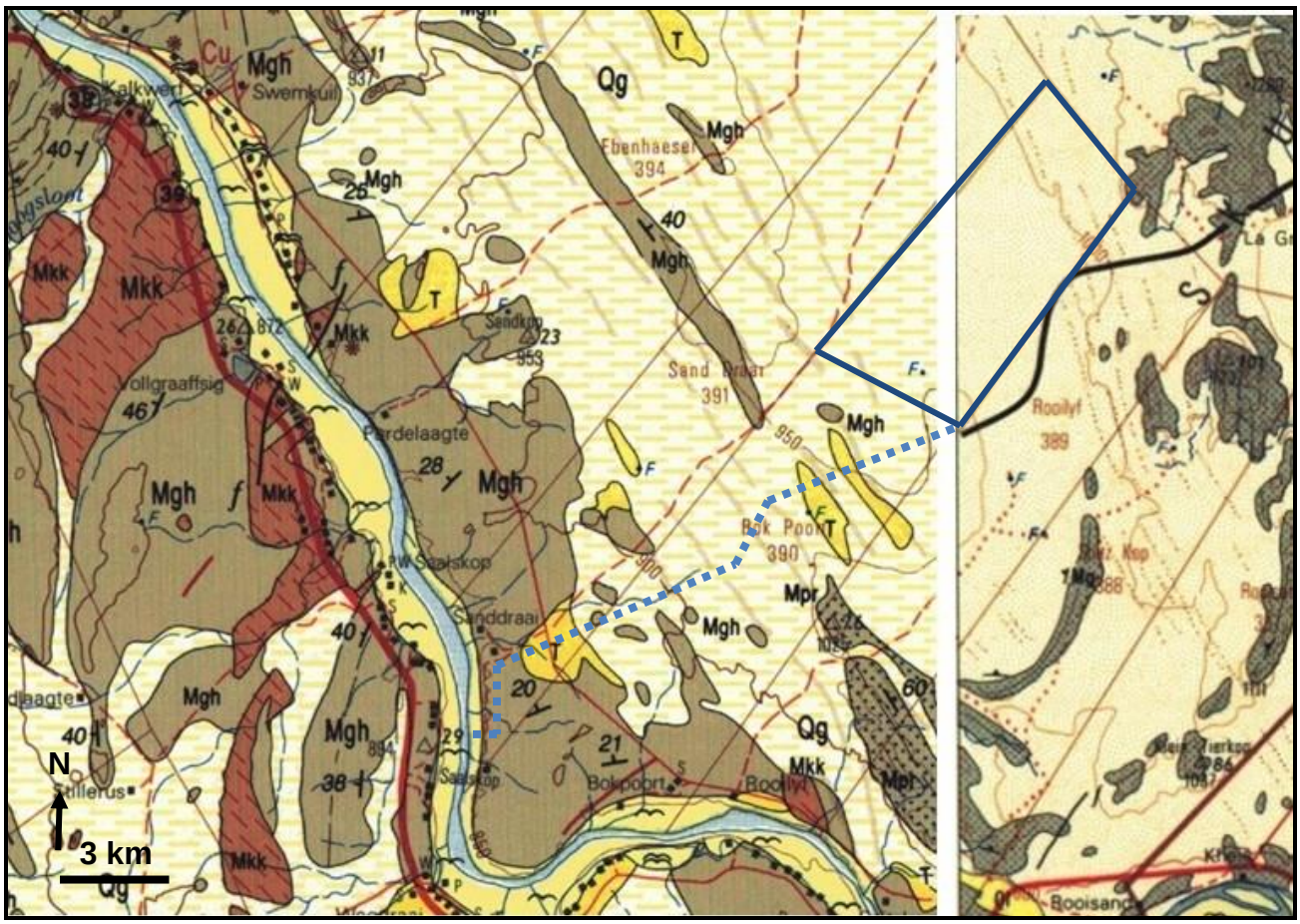

Figure 4: Extract from the adjoining 1: 250 000 geological maps 2820 Upington and 2822 Postmasburg (Council for Geoscience, Pretoria) showing the approximate location of the study area for the Bokpoort II Solar Power Facility on Farm Bokpoort 390 (dark blue polygon). The paler blue dotted line indicates the *approximate* course of the water pipeline to the Orange River.

The study area is underlain at depth by unfossiliferous Precambrian (Middle Proterozoic / Mokolian) basement rocks of the Namaqua-Natal Metamorphic Province (Mgh, Mg, Mpr *etc*, grey or grey-brown) that are assigned to the Brulpan Group and are intruded outside the study area by granite gneisses (Mkk, orange = Kalkwerf Gneiss). Superficial sediments of Late Caenozoic age include calcretes (T, bright yellow), reddish aeolian sands of the Gordonia Formation, Kalahari Group (Qg, pale yellow, with or without dashes), and alluvium of the Orange River (pale yellow with "flying bird" symbol). Small patches of older (Tertiary) terrace gravels are mapped on the eastern bank of the Orange River *c*. 25 km NW of Groblershoop, but *not* within the present study area.

4. PALAEONTOLOGICAL HERITAGE

The Precambrian metamorphic and igneous basement rocks of **the Namaqua-Natal Metamorphic Province** in the study area are entirely unfossiliferous (Almond & Pether 2008) and will therefore not be treated further here.

Late Caenozoic calcretes of the **Kalahari Group** may contain trace fossils such as rhizoliths, termite and other insect burrows, or even mammalian trackways. Mammalian bones, teeth and horn cores (also tortoise remains, and fish, amphibian or even crocodiles in wetter depositional settings) may be occasionally expected within Kalahari Group sediments and calcretes, notably those associated with ancient alluvial gravels and pans (*cf* Almond 2008a). However, these fossil assemblages are generally sparse, low in diversity, and occur over a wide geographic area, so the

palaeontological sensitivity of the calcretes within the study region is rated as low. This applies equally to the thin veneer of other surface deposits (rocky scree, stream alluvium *etc*) within this highly-arid region.

Alluvial gravels of the Orange River of Miocene and younger age are locally highly fossiliferous (*e.g.* Hendy 1984, Schneider & Marias 2004, Almond 2008a, 2009 and extensive references therein) but, as argued above, these are *not* mapped within the study area. Younger silty alluvial deposits may contain a range of terrestrial and freshwater fossils and subfossils. Freshwater snails are mentioned in particular by Moen (2007, p. 150). Stream gravels close to the west bank of the Orange River in the Groblershoop area were examined without success for palaeontological remains by Almond (2012).

5. PALAEONTOLOGICAL HERITAGE IMPACT ASSESSMENT

The Precambrian metamorphic bedrocks underling the study area at depth are unfossiliferous while the overlying Late Caenozoic superficial sediments are generally fossil-poor. As a consequence of the paucity of irreplaceable, unique or rare fossil remains within the development footprint the overall impact significance of the construction phase of the proposed solar energy project is assessed as LOW (negative) without mitigation, and VERY LOW (negative) after mitigation (See summary presented in Table 1). This assessment applies to all the planned infrastructure within the project area – *including* the water pipeline to the Orange River as well as the 132 kV overhead line connection to the Eskom Garona Substation - and applies equally to all PV plants under consideration for the Bokpoort II Solar Power Facility. There are no preferences on palaeontological heritage grounds for any particular infrastructure layout or technology alternative among the various options under consideration.

No significant further impacts on fossil heritage are anticipated during the planning, operational and decommissioning phases of the solar power facility. The no-go alternative (*i.e.* no development) would have a neutral impact on palaeontological heritage.

There are no fatal flaws in the present development proposal as far as fossil heritage is concerned. Providing that the proposed recommendations for palaeontological monitoring and mitigation outlined below are followed through, there are no objections on palaeontological heritage grounds to authorisation of this alternative energy project.

Confidence levels for this palaeontological heritage assessment are high. These conclusions are supported by previous palaeontological field assessments undertaken in the broader Kalahari study region (*e.g.* Almond 2012).

- **Cumulative impacts**

Given the low impact significance assessed for all solar energy developments concerned which are all underlain by very similar geology, it is likely that cumulative impacts associated with the Bokpoort II solar power facility are LOW. Very few palaeontological impact assessments for other developments in the wider project area near Groblershoop have been undertaken (SAHRIS website); one exception - for solar projects on the farm Sand Draai by Bamford (2016) - also concluded that the palaeontological sensitivity of the region is low.

Table 1: Assessment of impacts of the proposed Bokpoort II Solar Power Facility on fossil heritage resources within the development footprint during the construction phase of the development (*N.B.* Significant impacts are not anticipated during the operational and decommissioning phases).

Nature of impact: Disturbance, damage, destruction or sealing-in of *scientifically important* fossil remains preserved at or beneath the ground surface within the development area, most notably by surface clearance and bedrock excavations during the construction phase of the solar power facility.		
	Without mitigation	**With mitigation**
Scale	Site only (1)	Site only (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Minor (2)
Probability	Low (2)	Improbable (1)
Significance	**Negative Low (16)**	**Negative Very Low (8)**
Status	Negative	Negative (loss of fossils) & positive (improved fossil database following mitigation)
Reversibility	Irreversible	Irreversible
Irreplaceable loss of resources	No, since the limited fossil resources concerned are also represented outside the development area (*i.e.* not unique)	No, since the limited fossil resources concerned are also represented outside the development area (*i.e.* not unique)
Can impacts be mitigated?	Yes	Yes.
Mitigation: Monitoring of all substantial bedrock excavations for fossil remains by ECO on an ongoing basis during construction phase, with reporting of any substantial new palaeontological finds (notably fossil vertebrate bones & teeth) to SAHRA for possible specialist mitigation.		
Cumulative impacts: Low, given the very similar geology of the entire Bokpoort II study region.		
Residual impacts: Negative impacts due to loss of local fossil heritage will be partially offset by *positive* impacts resulting from mitigation (*i.e.* improved palaeontological database).		

6. SUMMARY & RECOMMENDATIONS

The project areas for the proposed Bokpoort II alternative energy developments on the Remaining Extent (RE) of the Farm Bokpoort 390 near Groblershoop are underlain, at or below the surface, by highly metamorphosed Precambrian basement rocks (schists, quartzites, gneisses) of the Namaqua-Natal Province that are entirely unfossiliferous. These are largely mantled by Late Caenozoic superficial sediments including Quaternary aeolian sands of the Gordonia Formation (Kalahari Group), calcrete pedocretes and alluvium of the Orange River and its tributaries. These younger superficial sediments are generally of low palaeontological sensitivity. Potentially fossiliferous older alluvial gravels are not mapped along the banks of the Orange River close to Groblershoop where these are intersected by the proposed water pipeline.

No significant fossil heritage resources have been recorded within the Bokpoort II solar power facility study area. The area is inferred to be of low sensitivity in terms of palaeontological heritage and no sensitive or no-go areas have been identified within it during the present desktop assessment. The proposed solar power facility is of LOW (negative) impact significance before mitigation with respect to palaeontological heritage resources. This assessment applies to all the planned infrastructure within the project area – *including* the water pipeline to the Orange River (already authorised) as well as the 132 kV overhead line connection to the Eskom Garona Substation - and applies equally to all PV plants under consideration for the Bokpoort II Solar Power Facility. Cumulative impacts associated with the ten PV solar energy developments are probably low, given the similar regional geology, and there are no fatal flaws in the development

proposal as far as fossil heritage is concerned. The no-go alternative is of neutral significance for palaeontology. Providing that the recommendations outlined below for palaeontological monitoring and mitigation are followed through, there are no objections on palaeontological heritage grounds to authorisation of this alternative energy project.

Pending the potential discovery of significant new fossil remains during development - notably fossil vertebrate bones & teeth - no further specialist palaeontological studies or mitigation are considered necessary for this project.

6.1. Recommended monitoring and mitigation

In the case of any significant chance fossil finds during construction (*e.g.* vertebrate teeth, bones, burrows, petrified wood, shells), these should be safeguarded - preferably *in situ* - and reported by the ECO as soon as possible to the South African Heritage Resources Agency, SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). This is so that appropriate mitigation by a professional palaeontologist can be considered. Such mitigation usually involves the judicious sampling, collection and recording of fossils as well as of relevant contextual data concerning the surrounding sedimentary matrix. The palaeontologist concerned would need to apply beforehand for a collection permit from SAHRA. A tabulated Chance Fossil Finds Procedure is provided in Appendix 1 to this report.

These recommendations should be incorporated into the Environmental Management Plan (EMP) for each alternative energy development.

7. ACKNOWLEDGEMENTS

I am grateful to Ms Seshni Govender of Royal HaskoningDHV, Woodmead, for commissioning this study as well as for providing the necessary background information. The original cultural heritage assessment for this project by Dreyer (2015) provided a very useful resource for evaluating surface geology in the study area.

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9. QUALIFICATIONS & EXPERIENCE OF THE AUTHOR

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape, Limpopo, Northwest, KwaZulu-Natal, Mpumalanga and the Free State under the aegis of his Cape Town-based company *Natura Viva* cc. He has served as a long-standing member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and APHP (Association of Professional Heritage Practitioners – Western Cape).

Declaration of Independence

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.

Dr John E. Almond
(Palaeontologist)
***Natura Viva* cc**

<table>
<tr><td colspan="3">Appendix 1: CHANCE FOSSIL FINDS PROCEDURE: BOKPOORT II SOLAR POWER FACILITY ON THE REMAINING EXTENT OF FARM BOKPOORT 390 NEAR GROBLERSHOOP</td></tr>
<tr><td>Province & region:</td><td colspan="2">Northern Cape, ZF Mgcawu District Municipality.</td></tr>
<tr><td>Responsible Heritage Management Agency</td><td colspan="2">SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa.
Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za</td></tr>
<tr><td>Rock unit(s)</td><td colspan="2">Precambrian Namaqua-Natal basement rocks. Kalahari Group aeolian sands, calcretes, Late Caenozoic alluvium.</td></tr>
<tr><td>Potential fossils</td><td colspan="2">Mammalian bones, teeth and horn cores, freshwater molluscs, trace fossils in older alluvial deposits, calcrete hardpans.</td></tr>
<tr><td rowspan="5">ECO protocol</td><td colspan="2">1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (N.B. safety first!), safeguard site with security tape / fence / sand bags if necessary.</td></tr>
<tr><td colspan="2">2. Record key data while fossil remains are still in situ:
Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo
Context – describe position of fossils within stratigraphy (rock layering), depth below surface
Photograph fossil(s) in situ with scale, from different angles, including images showing context (e.g. rock layering)</td></tr>
<tr><td>3. If feasible to leave fossils in situ:
Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume</td><td>3. If not feasible to leave fossils in situ (emergency procedure only):
Carefully remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock)
Photograph fossils against a plain, level background, with scale
Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags
Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist
Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation</td></tr>
<tr><td colspan="2">4. If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.</td></tr>
<tr><td colspan="2">5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency</td></tr>
<tr><td>Specialist palaeontologist</td><td colspan="2">Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Agency. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.</td></tr>
</table>

Appendix D:
EAPs CV

Royal HaskoningDHV
Enhancing Society Together

Curriculum Vitae

Seshni Govender

Roads and Rail Environmental Consultant

E: seshni.govender@rhdhv.com
T: 087 352 1592

Seshni is a Environmental Consultant working on strategic environmental planning and water related projects. Seshni has been involved in numerous Water Use Licence projects, including complex integrated licencing that requires understanding cumulative environmental impacts. She also has been involved in the development of the Environmental Authorisation Processes for the N11-13X Mokpane Ring Road and the development of Photovoltaic Plants in the Northern Cape Province and Gauteng Environment Outlook .

Seshni has drafted applications for complex integrated licences that include components of National Environmental Management Act and National Water Act on behalf of Eskom and private companies. This has exposed her to the intricate mechanisms of trying to integrate environmental impacts with mitigations measures that will be in line with the sustainable development principles.

As an Environmental Scientist Seshni contributes to projects through; report writing, data management and analysis, environmental impact analysis, policy review and public engagement/consultation.
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Degree
BSc Environmental Science (Hons)
Nationality
South African
Years of experience
9
Years with Royal HaskoningDHV
9

Professional experience

Basic Assessment for the Proposed Developments of Ten (10) Photovoltaic (PV) plants at the Bokpoort farm near Grobblershoop, Northern Cape

> ACWA Power Energy Africa (Pty) Ltd
> Northern Cape Province, 2019

ACWA Power Energy Africa (Pty) Ltd (hereafter referred to as ACWA Power) is proposing to construct a solar energy facility (Bokpoort II) consisting of ten (10) photovoltaic (PV) plants on the north-eastern portion of the Remaining Extent (RE) of the Farm Bokpoort 390, located 20 km north-west of the town of Groblershoop within the !Kheis Local Municipality in the ZF Mgcawu District Municipality, Northern Cape Province.

On 21 October 2016, a 900 ha, 150 MW Concentrating Solar Power (CSP) plant was authorised by the Department of Environmental Affairs (DEA). Due to the changes in the Integrated Resource Plan (IRP) published in October 2019, ACWA Power intend replacing the authorised CSP site with eight (8) new PV plants. The updated layout has been revised to incorporate the 8 new PV plants of 250 MW each, covering a total of 1200 ha (i.e. 150 ha for each plant).

Two 250 ha 75 MW PV plants including ancillary infrastructure, were also authorised by the DEA on 24 October 2016. As the PV 1 and PV 2 plants are also approved on the Farm Bokpoort 390 RE, the footprints of these approved PV plants will undergo an amendment to accommodate the 8 new PV plants and ancillary infrastructure.

Basic Assessment and Water Use Authorisation for the removal, re-instatement and repositioning of two high voltage powerlines routed through the Stellenbosch Landfill off Devon Valley Road, Stellenbosch, Western Cape

> Eskom Holdings SOC Ltd and Stellenbosch Municipality
> Western Cape Province, 2020

The Stellenbosch Municipality owns and operates the Stellenbosch Landfill situated off Devon Valley Road. The landfill comprises completed cells (cell 1 and 2) as well as an operating cell (cell 3). Cell 3 is separated from cells 1 and 2 by an area on the landfill property footprint that is used for access roads, entrance area and weighbridge, green waste chipping and rubble crushing and stockpiling activities. This area is also transversed by two high voltage Eskom powerlines. The presence of these powerlines prevents the Municipality from engineering and operating the area between completed cells 1 and 2 and operating cell 3 as waste disposal cells.

Eskom Distribution (Western Cape Operating Unit) therefore proposes removing, re-instating and repositioning the two powerlines (132kV and 66kV) routed through the landfill. The 132kV powerline will be relocated to the northern and eastern boundary of the landfill, whilst the 66kV powerline will be relocated to the eastern and southern boundary. The proposed length of each of the deviated lines are approximately 1km. Two alternative pylon structures are currently being considered i.e. monopoles and lattice towers.

Basic Assessment and Environmental Management Programme for the Borrow Pit 5.5L associated with the N11 Section 13X (N11-13X), Mokopane Ring Road, Mogalakwena Local Municipality, Limpopo province

> South African National Roads Agency Ltd
> Limpopo Province, 2019

The South African National Roads Agency Ltd (SANRAL) has commissioned the Detail Design and the Construction Monitoring of the N11-13X Mokopane Ring Road to divert the heavy vehicle traffic that travels to and from the mines on the western side of Mokopane and to Botswana, from the already congested existing N11 section which passes through the existing villages and the Mahwelereng Township.

The N11-13X Mokopane Ring Road is a “greenfields” project where a new road will be constructed. The class of the new road will be Class 1. The new road to be constructed will typically have an overall width of 13.4 m where the initial carriageway will comprise a minimum 2.5 m outer shoulder, 2 x 3.7 m lanes, and 2.5 m inner shoulder. In general, the road reserve varies between 71 – 75 m but there are wider sections where there is a deep cutting or because of allowance for future interchanges.

A limited amount of gravel (G5 – G7 quality) will be available from cut widenings within the road reserve. The remainder of the gravel required for the proposed road construction (gravel layer works) will need to be sourced from borrow pits.

Application for Postponement of Compliance Timeframes to achieve New Plant Standards at ArcelorMittal South Africa, Vanderbijlpark Works, Emfuleni Local Municipality

> ArcelorMittal South Africa

> Gauteng Province, 2019

In response to Section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004) (as amended in 2018), ArcelorMittal applied for a postponement of the compliance timeframes to achieve the new plant minimum emission standards, as well as alternative emission standards for certain plants at the Vanderbijlpark Works (AMSAVW), Emfuleni Local Municipality, Gauteng.

Application for an Alternative Plant Standard and Suspension Application for activities associated with the ArcelorMittal Pretoria Works, City of Tshwane, Gauteng.

> ArcelorMittal South Africa

> Gauteng Province, 2019

In response to Section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (as amended in 2018), ArcelorMittal intends to apply for an alternative plant standard and submit a suspension application of the compliance timeframes to achieve the new plant minimum emission standards for the Pretoria Works, City of Tshwane, Gauteng.

Water Use Licence application for the Urania-Bronville Powerline Upgrade Project, Matjhabeng Local Municipality, Free State Province

> Matjhabeng Local Municipality

> Free State Province, 2019

The construction of new overhead powerlines to replace the existing underground powerlines that are no longer operational. The works will comprise the supply, delivery, off-loading, installation, erection, commissioning and handing-over (in a proper working condition) of the following infrastructure.

The construction of a new approximately 3.3 km, 132 kV overhead line between the Welkom Main Intake Substation and Urania Substation.

The construction of a new approximately 5.5 km, 11 kV overhead line between the Industries Substation and Bronville Substation.

Water Use Licence for the Proposed Deviation of the 88kV Firnham-Platrand Powerline near Standerton, Mpumalanga Province

> Eskom Holdings SOC Limited

> Mpumalanga Province, 2018

Eskom Holdings Limited, a State-Owned Company (SoC) proposed a deviation of a portion of the existing 88kV Firham-Platrand Powerline from pole 157 to pole 180 within a servitude of 31m and a length of approximately 2km. The purpose of the deviation is to avoid a wetland in which these poles are currently located which poses a network stability risk as it is located within a wetland area.

Firham Platrand is an interconnector between Standerton and Volksrust for network stability, the line supplies Transnet Traction Stations, should the line fail, the trains in the nearby tractions will not be able to move.

Water Use Licence Application for the Proposed Site Clearance for Planning and Design of a Border Barrier, Patrol Roads and Fencing between the Republic of South Africa (RSA), Swaziland and Mozambique, Phase 1 (KM 0.0 0 KM 54.0)

> The National Department of Public Works (DPW) and KwaZulu-Natal Department of Transport (KZN DoT)

> KwaZulu-Natal Province, 2018

Proposed the upgrade of existing border control infrastructure, and development of new border control infrastructure along a portion of the South Africa (KwaZulu-Natal) - Mozambique Border in the north-eastern part of the KwaZulu-Natal (KZN) Province. This application is termed the 'Phase 1' application and forms a component of a wider project being undertaken by the DPW for the upgrading of border control infrastructure along the South Africa - Swaziland border and the southern part of the South Africa - Mozambique border (the Phase 2 Project). The Phase 1 alignment is comprised of the section of the international border with Mozambique from the high-water mark of the Indian Ocean (KM0.0) to the eastern boundary of the Ndumo Game Reserve (KM54.0).

Environmental Screening Investigation: Route Determination for the K178 between the Gauteng Provincial Border and PWV1, Gauteng Province

> Gauteng Department of Roads and Transport (GDRT)
> Gauteng, 2018

The purpose of the Gauteng Strategic Road Network (GSRN) conceived by the Gauteng Department of Roads and Transport (GDRT) some 40 years ago was to plan a robust road system, with the objective of preserving transportation corridors and serving as a guideline for the rapid development and urbanisation of Gauteng.

The route for the K178 is the section between the Gauteng Provincial Border (in the east) and the future PWV1 (in the west) with an approximate length of 18.8km. The alignment generally follows the previous planned GDRT route along the alignment of the existing R54.

In the context of integrated environmental management, screening determines whether a development proposal requires environmental assessment, and if so, what level of assessment is appropriate. Screening is thus a decision-making process that is initiated during the early stages of the development of a project.

The main purpose of the ESI was to determine at this stage of the road design whether there are aspects of the development proposal that have the potential to give rise to significant or unacceptable environmental consequences i.e. fatal flaws.

Water Use Licence Application for the Proposed Site Clearance for Planning and Design of a Border Barrier, Patrol Roads and Fencing between the Republic of South Africa (RSA), Swaziland and Mozambique, Phase 2 (KM 54.0 0 KM 524.0)

> The National Department of Public Works (DPW)
> KwaZulu-Natal and Mpumalanga Provinces, 2018

The National Department of Public Works (DPW) as the applicant, (in conjunction with the KwaZulu-Natal Department of Transport (KZN DoT) as an implementing agent) is proposing the upgrade of existing border control infrastructure, and development of new border control infrastructure along a portion of the South Africa–Mozambique-Swaziland Border in KwaZulu-Natal and Mpumalanga. This application was termed the 'Phase 2' application and forms a component of a wider project being undertaken by the DPW for the upgrading of border control infrastructure along the South Africa - Swaziland border and the southern part of the South Africa - Mozambique border. The Phase 1 alignment is comprised of the section of the international border with Mozambique from the high-water mark of the Indian Ocean (KM0.0) to the eastern boundary of the Ndumo Game Reserve (KM54.0), whilst this Application (Phase 2) is from KM54.0 to KM524.0.

The project is being undertaken by the DPW in conjunction with the Department of Agriculture Forestry and Fisheries (DAFF) and the South African National Defence Force (SANDF), and Ezemvelo KZN Wildlife (EKZNW) and the iSimangaliso Wetland Park Authority (IWPA) as partner organs of state. The KZN DoT is an implementing agent for one of the infrastructure components (the border barrier structure).

The aim of the project is to stop the illegal trafficking of stolen vehicles and contraband across this section of the international border, as well as to prevent the illegal movement of people as well as livestock that could transmit disease. South Africa has approximately 4 800 km of land border and 2 800 km of coastline border which is required to be secured. South Africa is greatly affected and financial impacted by illegal imports, smuggling and other similar illegal activities which transpire over borders. In order to effectively respond to the range of security and control challenges that are being experienced by responsible organs of the State, it is important to assess the situation and to be able to incorporate a viable solution.

Basic Assessment for the Proposed Construction of a Bridge over the Rooisloot River, Various Culverts and Borrow Pits Associated With the National Route N11 Section 13x (N11-13x) (Mokopane Ring Road) in the Mokopane Area

> South African National Roads Agency Ltd

> Limpopo Province, 2018

The South African National Roads Agency Ltd (SANRAL) has commissioned the Detail Design and the Construction Monitoring of the N11-13X Mokopane Ring Road. An Environmental Impact Assessment (EIA) study was previously conducted for the proposed re-routing of the N11-13X road. The Environmental Authorisation and subsequent approval of the Environmental Management Plan (EMP) was obtained in 2009. The subject of this Basic Assessment Process was therefore to address the infilling activities within the watercourses which pertain to the Rooisloot Bridge and the associated culverts. There were 5 Borrow Pits associated with this project that were also subject to Basic Assessment Processes.

NW Environment Outlook, South Africa

> North West Department of Rural, Environment and Agricultural Development

> Mahikeng, 2018

Compilation of the water chapter as part of the publication of the North West Environment Outlook

Integrated Water Use Licence Application for the Rehabilitation of the Existing P236 and Culvert from km 6.235 to km 14.0

> KwaZulu-Natal Department of Transport

> Ubombo,, KwaZulu-Natal, 2017

The P236 is located north of Mkhuze and starts at km 0.0 at the intersection with P2-9 and ends at km 32.0, intersecting P449. The application, however, was only for the rehabilitation of km 6.235 to km 14.0 of the P236 as well as the replacement of a culvert at Km 6.240.

Integrated Open Space for the Greater Khayalami and Ruimsig/Honeydew Sub Regions

> City of Joburg, 2017

Development of two integrated open space plans for the Greater Khayalami and Ruimsig-Honeydew Sub-regions which aim to ensure that ecological goods and services are maintained and enhanced so as to contribute to spatial planning in the City of Johannesburg, and both economic and social development.

Water Use Licence Application for the Proposed Upgrade of Dango Bridge (B1372) and Bedlane Bridge (B1336) situated along P393 (R34) Road Between Nkwalini Pass (Km0,0) and Empangeni (Km24,0)

> KwaZulu-Natal Department of Transport

> Empangeni, KwaZulu-Natal, 2017

The KwaZulu-Natal Department of Transport (DoT) proposed to improve the Provincial road P393 (R34) from P47-4 at Nkwalini Pass (km 0.0) to P230 at Empangeni (km 24.0) within the King Cetshwayo District Municipality in KwaZulu-Natal Province. The project starts at the intersection of P47-4 (R66) with P393 (R34) at Nkwalini Pass (km 0.0) and ends at P230 (km 24.0) towards Empangeni. The Bedlane river bridge (B1334) is situated at km 2.6 from Nkwalini Pass and the Dango river bridge (B1372) is situated at km 3.9 from Nkwalini Pass. The existing P393 road is 8.8m wide and the proposed road geometry for the rehabilitation is 10.0m wide including shoulders.

Water Use Licence Application for the Proposed Culvert Rehabilitation along Provincial Road P230 from Km37.0 to Km47.0

> KwaZulu-Natal Department of Transport

> Umhlathuze Local Municipality, KwaZulu-Natal, 2017

This project formed part of the Empangeni Road Rehabilitation Programme and covers the rehabilitation of the provincial road P230 between km 37,0 and km 47,0 within the uMhlathuze Local Municipality which forms part of the King Cetshwayo District Municipality (DC28), KwaZulu-Natal. Provincial Road P230 from the intersection with P393 at km 37,0 to km 47,0 near Empangeni is defined as an undivided two lane road, and has been classified as a Class R1 Rural Arterial Road (in terms of the TRH26). The P230 forms part of the R34 long distance heavy haul freight route, which connects the harbour of Richards Bay and the surrounding industrial and commercial areas, with inland provinces.

Integrated Water Use Licence Application for the Canelands Extension Development, KwaZulu-Natal

> Tongaat Hulett Developments

> Kwadukuza Municipality, KwaZulu-Natal, 2017

Tongaat Hulett Development wishes to develop the site for industrial purposes. The site lies adjacent to the existing Canelands Industrial estate. Potential land uses may include general / industrial, logistics, warehousing and distribution. These land uses will complement those of the existing Canelands Industrial Estate and will ensure that this land parcel reads as an extension to the existing development. It is proposed, due to the proximity of the floodplain and numerous other constraints located on-site, that a single platform covering an area of approximately 1.67 hectares (1.67 ha) is created. Both a servicing and traffic report has been completed, which details how this development will be accommodated by the existing bulk infrastructure within the region.

Gauteng Province Environment Outlook Report

> Gauteng Department of Agriculture and Rural Development

> Gauteng, 2017

State of the Environment Report (SoER) is a report card on the condition or quality of the environment. It provides information on how we affect the environment, how the environment affects us, and how this condition has changed over time. Environmental conditions are analysed through the use of environmental indicators which are proxies of environmental status, and which can be monitored over time and space. Reporting on the State of Environment (SoE) is therefore an important tool in identifying, assessing and setting priorities for environmental issues, as well as in determining whether environmental policies and actions are effective. Furthermore, the 'environment outlook' component attempts to describe or predict how environmental challenges will evolve in the near future, and what needs to be done to achieve a more sustainable state of living for all people in the province. The ultimate value of environmental outlook reporting lies in the degree to which that assessment can be used for adaptive environmental management to address anticipated future environmental conditions and pressures.

North West Envrionmental Outlook/State of the Environment Trend Analysis

> North West Department of Rural, Environment and Agricultural Development

> Mahikeng, 2017

The *Environmental Trend Analysis Report* focused on the publications of the North West Province State of Environment and Environment Outlook Reports dated 1995, 2002, 2008 and 2013, in an effort to expand this trend reporting to fully cover the period 1995 to 2013. This exercise followed on from the 2013 Environment Outlook Report which reported on environmental trends and made related recommendations to guide the province towards a more sustainable future. As such, the following objectives were achieved:

> The indicators for each chapter were tracked through the reporting period

> Data Gaps Identified

> the value of the indicator set determined

Environmental Impact Assessment and Integrated Water Use Licence Application for the Tinley Manor Southbanks Coastal Development, KwaZulu-Natal

> Tongaat Hulett Developments

> Kwadukuza Municipality, KwaZulu-Natal, 2017

Tongaat Hulett Developments proposes to develop the Tinley Manor Southbanks Coastal Development into a mixed-use coastal development including a large residential component. Tinley Manor Southbanks Coastal Development is an approximately 485 ha site, located between the coastal towns of Tinley Manor and Sheffield Beach within the KwaDukuza Municipality, KwaZulu-Natal.

The proposed Tinley Manor Southbanks Coastal Development is set to be the first phase of the development of Tongaat Hulett Developments' land holdings in Tinley Manor, which is situated to the south and north of the Umhlali River.

Integrated Open Space Plan – Greater Khayalami and Ruimsig-Honeydew Sub-Regions, Johannesburg, South Africa

> >Client: City of Johannesburg, 2016

Development of two integrated open space plans for the Greater Khayalami and Ruimsig-Honeydew Sub-regions which aim to ensure that ecological goods and services are maintained and enhanced so as to contribute to spatial planning in the City of Johannesburg, and both economic and social development.

Royal HaskoningDHV

Update of the Dube Tradeport State of the Environment Report
> Dube Tradeport Corporation
> KwaZulu-Natal, 2016
Compilation of the Dube Tradeport State of the Environment Report 2016/2017

Integrated Open Space Plan - Linbro Park & Greater Bassonia, Johannesburg, South Africa
> City of Johannesburg,2016
Development of two integrated open space plans for the Linbro Park and Greater Bassonia which aim to ensure that ecological goods and services are maintained and enhanced so as to contribute to spatial planning in the City of Johannesburg, and both economic and social development.

Final Consultation Basic Assessment Report for the Dismantling of a portion of the existing double-circuit power line and the construction of two (2) 7 km long 88 kV power lines within a 2 km corridor between the Grootpan and Brakfontein Substations
> >Eskom Holdings SOC Ltd
> Ogies, Mpumalanga, 2015
Eskom Holdings (SoC) Pty Ltd (Eskom Distribution – Mpumalanga Operating Unit) proposes to construct two (2) 7 km 88 kV overhead power lines within a 2 km corridor between Grootpan and Brakfontein Substations near Ogies. The existing power lines are located on GlencoreXstrata mining property. The mine has requested that Eskom relocate the lines as they are within the operational footprint of the mine. The project also involves the dismantling of a portion of the existing 88 kV double-circuit mink power line approximately 5.2 km in length. The new power lines will ensure continuity of supply and access to electricity for the surrounding communities.

Conduct Pre-Feasibility (FEL-2) Waterberg Heavy Haul Line, South Africa
> Transnet SOC Ltd
> Waterberg, 2015
High-level environmental screening investigation for the proposed +- 600km rail corridor running from Lephalale to Ermelo as part of the national Strategic Infrastructure Project (SIP) suite.

Tembisa Hub Plan, South Africa
> >Intersite Property Management Services
> Ekurhuleni Metropolitan Mucipality, 2015
Preparation of a Precinct plan for the Tembisa Urban Hub in Ekurhuleni.

Review and Update of the City of Windhoek's Environmental Policy
> Consulting Services Africa (CSA)
> Windhoek, Namibia, 2014
Review the existing City of Windhoek Environmental Management Policy, 2004 and revise and improve the existing policy so that it may be approved, launched, and implemented by the Windhoek City Council.

Green existing by-laws and develop a set of new environmental by-laws or amend the existing by-laws,
> Ekurhuleni Metropolitan Municipality
> Ekurhuleni, 2014
Review the existing Ekurhuleni by-laws by introducing environmental considerations and develop a set of new environmental by-laws if required.

Route Determination and EIA for K86, K118, K181 K208, K217 and K219,
> Gauteng Department of Roads and Transport
> Gauteng Province, 2014
Route Determination and Environmental Scan of K-routes in the Gauteng Province.

Dube Tradeport State of the Environment Report
> Dube Tradeport Corporation
> KwaZulu-Natal, 2014
Compilation of the Dube Tradeport State of the Environment Report 2013/2014

State of Environment Report (SOER) for City of Johannesburg, South Africa
> >South African Cities Network
> City of Joburg, 2014
Compilation of the State of the Environment Report for the City of Johannesburg 2014

Cornubia Human Settlement - Integrated Water Use Licence Application, South Africa
> Tongaat Hulett Developments (Pty) Ltd
> Cornubia, KwaZulu-Natal, 2013
Water Use Licence Application for the Cornubia Industrial and Business Estate, Phase 1-Retail Park, Cornubia Phase and Cornubia Bridge

NW Environment Outlook, South Africa
> North West Department of Economic Development, Environment, Conservation and Tourism
> Mahikeng, 2013
Compilation and Publication of the North West Provincial

Qualifications

2010 BSc (Hons) Environmental Science, University of KwaZulu Natal, South Africa

2009 BSc Environmental Science, University of KwaZulu Natal, South Africa

Royal HaskoningDHV
Enhancing Society Together

Curriculum Vitae

Prashika Reddy

Road and Rail
Senior Environmental Scientist

[redacted]

Prashika started her career in the environmental field after spending 5 years' working for the Department of Agriculture: Genetic Resources Directorate. She is a Senior Environmental Scientist in the Environmental Management and Planning Unit within the Roads and Rail Advisory Group. In 2010, she obtained her professional registration as a Natural Scientist in the field of Environmental Science. She is a registered Environmental Assessment Practitioner with EAPASA.

Prashika has built up an impressive résumé, having worked on diverse projects mainly in the petro-chemical industry, as well as various large-scale power generation projects. She has established good working relationships with key clients and has undertaken several flagship projects on their behalf, such as Sasol and Eskom's Underground Coal Gasification project.

Years of experience
19

Years with Royal HaskoningDHV
14

Professional memberships
SA Council for Natural Scientific Professions, Pr Sci Nat, 400133/10
EAPASA, Registered EAP, 2019/917

Qualifications
1999: Bachelor of Science Honours: Botany, University of KwaZulu-Natal
2006: Bachelor of Science Honours: Geography (with distinction), University of Pretoria

Professional experience

Environmental Impact Assessment (EIA), Waste Management Licence and Integrated Water Use Licence for the Underground Coal Gasification (UCG) Project and associated infrastructure in support of co-firing of gas at the Majuba Power Station, Mpumalanga, South Africa, South Africa

Start Date: 2008 - 2015
Client Name: Eskom Holdings SOC Ltd
Project Value: R 5,900,000
Eskom Holdings (SOC) Ltd appointed Royal HaskoningDHV to undertake the integrated environmental authorisation process, as well as the integrated Water Use Licence, for the UCG pilot project and associated infrastructure in support of co-firing of gas at the Majuba Power Station. UCG is a process whereby coal is converted in situ into combustible gas that can be used for power generation and is one of the new clean coal technologies being developed for implementation by Eskom that intends to diversify Eskom's fuel supply.
Position: Project Manager
Assigned Tasks: Project management, client liaison, compilation of environmental reports, management of the specialist team, authority consultation and co-management of the public participation process

Integrated Environmental Authorisations for the proposed Concentrated Solar Power (CSP) Plants on the farm Sand Draai, Northern Cape Province

Start Date: 2014 - 2016
Client Name: Solafrica Energy (Pty) Ltd
Project Value: R 1,500,000
Solafrica appointed Royal HaskoningDHV to undertake the integrated environmental authorisation and waste licence processes for two CSP plants (central receiver and parabolic trough) with an electricity generation capacity of between 100 - 150MW to be constructed on the farm Sand Draai, Upington.
Position: Environmental Scientist
Assigned Tasks: Compilation of environmental reports

Environmental Impact Assessment for the Pumped Storage Power Generation Facility in the Steelpoort area, Mpumalanga and Limpopo Provinces

> Start Date: 2005 - 2007
> Client Name: Eskom Holdings SOC Ltd
> Project Value: R 1,300,000

As part of the increased electricity supply plan, Eskom will be constructing a Pumped Storage Scheme (PSS) in the Steelpoort area, Limpopo and Mpumalanga Provinces. It is planned that the scheme will have an installed capacity of approximately 1520MW. The proposed scheme consists of the following components: upper and lower reservoirs; underground power house complex and associated waterways that link the reservoirs; and ancillary works.
Position: Project Manager
Assigned Tasks: Completion of the EIA study and reports (EIA Report and EMP), project management, client liaison, management of the specialist team, authority consultation and co-management of the public participation process

Basic Assessment Study for Eight New PV Developments on the Farm Bokpoort, Groblershoop

Start Date: 2019
Client Name: ACWA Power Africa Holdings (Pty) Ltd
Project Value: R 966,123
Due to the changes in the Integrated Resource Plan published in October 2019, ACWA Power intend replacing the authorised CSP site with 8 new PV plants. The updated layout has been revised to incorporate the 8 new PV plants of 200MW each, covering a total of 1200ha (i.e. 150ha for each plant) on Remaining Extent of the Farm Bokpoort 390.
Position: Environmental Scientist and Project Manager
Assigned Tasks: Compilation of environmental reports and project management

Basic Assessment Study for Seven 9.9MW Internal Combustion Engines (ICE) at the Previously Authorised PV Developments on the Farm Bokpoort, Groblershoop

Start Date: 2020
Client Name: ACWA Power Africa Holdings (Pty) Ltd
Project Value: R 153 000
Recently, the Department of Mineral Resources and Energy issued a Request For Proposal (RFP) to which ACWA Power will be participating. A condition in the RFP requires Bidders to not tap into the national grid for power and requires that a reliability test be undertaken at specified generation rate and time. In meeting the RFP requirements, ACWA Power has decided to supplement their already authorised project infrastructure by the addition of ICE infrastructure in the projects to be bid.

Position: Environmental Scientist and Project Manager
Assigned Tasks: Compilation of environmental reports and project management

Environmental Screening Investigation for the Establishment of a Solar Based Electricity Generation System on a Build, Own, Operate and Maintain Basis – 118MW Photovoltaic Plant at the Tubatse Chrome Plant, Steelpoort, Limpopo
Start Date: 2020
Client Name: Samancor Chrome
Project Value: R 146 000
As part of the Transaction Advisory Services, Royal HaskoningDHV's Environmental Management and Planning (EM&P) Knowledge Group have been appointed to conduct a high-level desktop Environmental Screening Investigation (ESI) of twelve (12) sites to investigate the environmental sensitivities, opportunities and constraints associated with the proposed project for the proposed 118MW PV plant at the Tubatse Chrome Plant in the Steelpoort area, Limpopo Province.
Position: Environmental Scientist
Assigned Tasks: Compilation of environmental reports and project management

Environmental Impact Assessment (EIA), Waste Management Licence and Integrated Water Use Licence for the Matimba Power Station Ash Disposal Facility, South Africa
Start Date: 2012 - 2016
Client Name: Eskom Holdings SOC Ltd
Project Value: R 5,800,000
Approximately 4.8 million tons of ash is produced annually from the Matimba Power Station. This ash is currently being disposed by means of 'dry ashing' ~3km south of the power station. The proposed ash disposal facility will ensure that the power station is able to accommodate the 'ashing' requirements for the remaining life (approximately 44 years) of the Power Station.
Position: Environmental Scientist, Project Manager
Assigned Tasks: Compilation of environmental reports (EIA Report and EMPr), project management, management of the public participation process and specialist team

Charlie 1 Landfill Stormwater Management & Optimisation Project, Sasol Secunda, South Africa
Start Date: 2015 - 2016
Client Name: Sasol Chemical Industries (Pty) Ltd
Project Value: R 735,000
The Sasol Synfuels, Secunda, Charlie 1 landfill site was authorised in 1993 as a Class II Site, in terms of the Environmental Conservation Act (ECA) (Act No. 73 of 1989). Recent legislation changes such as the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and the new Waste Classification and Management Regulations, August 2013 (GN 634) have implications for the management of waste disposal sites. The latest audits conducted at Charlie 1 landfill site highlighted that the water management is not in accordance with the permit requirements. Therefore, the Pollution Control Dam (PCD) of approximately 16000m3 will be constructed to ensure compliance with the existing permit requirements. It will be constructed to ensure effective management of leachate and stormwater.
Position: Project Manager
Assigned Tasks: Project management

Scoping Study for the Full-Scale Composting of Sludge Waste Streams, South Africa
Start Date: 2014
Client Name: Sasol Chemical Industries (Pty) Ltd
Project Value: R 850,000
The proposed project involves constructing a full-scale compositing site that will be able to handle approximately 200000 - 300000t/a of sludge generated at the Sasol Secunda plant.
Position: Project Manager
Assigned Tasks: Project management, quality review of Environmental Scoping Report and public participation documentation

Waste Management Licence for the BMW Waste Facility, South Africa
Start Date: 2010
Client Name: BMW SA (Pty) Ltd
Project Value: R 168,797
Position: Project Manager
Assigned Tasks: Project management, client management, authority consultation, report compilations and internal review of work

EIA and Water Use Authorisation for the Removal, Re-Instatement and Re-Positioning of Two High-Voltage Powerlines routed through the Devon Valley Landfill, Stellenbosch
Start Date: 2019
Client Name: Stellenbosch Municipality
Project Value: R 820,000
The Stellenbosch Municipality owns and operates the Stellenbosch Landfill situated off Devon Valley Road. The landfill comprises completed cells (cell 1 and 2) as well as an operating cell (cell 3). Cell 3 is separated from cells 1 and 2 by an area on the landfill property footprint that is used for access roads, entrance area and weighbridge, green waste chipping and rubble crushing and stockpiling activities. This area is also transversed by two high voltage Eskom powerlines. The presence of these powerlines prevents the Municipality from engineering and operating the area between completed cells 1 and 2 and operating cell 3 as waste disposal cells.
Position: Project Manager and Environmental Scientist
Assigned Tasks: Project management, compilation of environmental reports, management of specialist team

Site Clearance: Planning and Design for Maintenance and/or Upgrade of the Patrol Roads and Fencing on the Borders between RSA, Swaziland and Mozambique
Start Date: 2016
Client Name: Department of Public Works
Project Value: R 2,598,000
Undertake the Basic Assessment study, mining permitting as well as Water Use Licencing application processes associated with the border patrol road and fence.
Position: Project Manager
Assigned Tasks: Project management

Basic Assessment and Water Use Licence for the rehabilitation of the existing P236 gravel road from km6.235 to km14.0 in Ubombo, KwaZulu-Natal
Start Date: 2016
Client Name: KwaZulu-Natal Department of Transport
Project Value: R 546,186
This project is a rehabilitation of a portion of the existing P236 road from km6.235 to km14.0, where the surfaced width will be increased by 2.5m and where there are climbing lanes; the surfaced width will increase by 5.6m. In areas where there will be horizontal curve widening, the width will be increased by 4.5m. Furthermore, existing culverts with be lengthened where required to accommodate the increase in the road bed width. A culvert at a stream crossing, is also planned to be replaced at km6.240 of the P236.
Position: Strategic Environmental Advisor
Assigned Tasks: Quality review of environmental reports and public participation documentation

Basic Assessment and Water Use Licence for the proposed bridge crossing over the uMfolozi River linking the Esiyembeni and Novunula areas within the Mtubatuba Local Municipality, KwaZulu-Natal
Start Date: 2016
Client Name: KwaZulu-Natal Department of Transport
Project Value: R 522,225
The KwaZulu-Natal Department of Transport (KZN DoT) is planning to construct a bridge over the uMfolozi River and associated link road that will serve to link the Esiyembeni and Novunula local communities situated on either side of the uMfolozi River which is currently impassable save for the existing N2 bridge crossing to the east near Mtubatuba.
Position: Strategic Environmental Advisor
Assigned Tasks: Quality review of environmental reports and public participation documentation

Basic Assessment for the construction of two 7km long 88kV Power Lines Grootpan / Brakfontein, South Africa
Start Date: 2015
Client Name: Eskom Holdings SOC Ltd
Project Value: R 458,021
The proposed project involves the construction of two (2) 7km 88kV power lines and dismantling of two (2) 88kV power lines from Grootpan to Brakfontein, south of Ogies in Mpumalanga.
Position: Project Principal
Assigned Tasks: Quality review and overall project management

Proposed Tinley Southbanks Beach Enhancement Project in the KwaDukuza Municipality, KwaZulu-Natal
Start Date: 2016
Client Name: Tongaat Hulett Developments (Pty) Ltd
Project Value: R 925,270

The Tinley Manor Southbanks development provides for the coastal resort, however, it does not provide for what is critical for the success of the resort and that is a safe swimming beach in close proximity to the resort. The lack of a safe swimming beach with public amenities adjacent the development was identified as a major constraint. This EIA is therefore targeted at dealing with this constraint and to enable the provision of a new beach resort that has all the requirements to be able to attract international investment, including specifically a safe, swimming beach.
Position: Strategic Environmental Advisor
Assigned Tasks: Provide strategic advice on project, review of environmental reports

Environmental Impact Assessment for the Cornubia Phase 2 Development, KwaZulu-Natal, South Africa
Start Date: 2012
Client Name: Tongaat Hulett Developments (Pty) Ltd
Project Value: R 989,660
Conduct a full Environmental Impact Assessment (EIA) for the proposed Cornubia Mixed Use Phased development - Phase 2 in Mount Edgecombe, KwaZulu-Natal.
Position: Strategic Environmental Advisor
Assigned Tasks: Provide strategic advice on project, review of environmental reports

Cornubia Retail Park - EIA, South Africa
Start Date: 2012
Client Name: Tongaat Hulett Developments (Pty) Ltd
Project Value: R 370,120
Undertaking the EIA, Public Participation Process (PPP), attending client progress meetings and providing environmental input into the planning of the proposed Phase 2 Retail Development.
Position: Strategic Environmental Advisor
Assigned Tasks: Environmental Scientist. Strategic project advice, quality review and approval of reports

Centurion Metropolitan Core Masterplan: Stormwater and Flooding, South Africa
Start Date: 2012
Client Name: City of Tshwane Metropolitan Municipality
Project Value: R 4,300,000
The City of Tshwane requires a multi-disciplinary project team to assist the Client with the Preparation of a Master Plan of the Centurion Metropolitan Core Study Area.
Position: Environmental Scientist
Assigned Tasks: Environmental Screening Investigation

Environmental Screening for the Commercial 125MW CSP, South Africa
Start Date: 2012
Client Name: Sasol Technology (Pty) Ltd
Project Value: R 185,000
Environmental Screening Investigation for the proposed 125MW commercial concentrated Solar Power Plant located in Upington.
Position: Project Principal
Assigned Tasks: Project Management, financial management, review of Environmental Screening Report

Route Determination and Environmental Screening Investigation of 14 K-routes, South Africa
Start Date: 2016-2019
Client Name: Gauteng Department of Roads and Transport
Project Value: R 5.6 Million
Route determination and ESI for routes K
Position: Environmental Scientist
Assigned Tasks: Environmental Screening Investigation and compilation of the ESI Report

City of Tshwane: Waste Transfer Facilities, South Africa
Start Date: 2014
Client Name: City of Tshwane Metropolitan Municipality
Project Value: R 150,000
Report on environmental and sustainability considerations in Waste to Energy (WtE) Plants when they are co-fired with Municipal Solid Waste. Concept designs and environmental screening of various waste transfer stations. Situational assessment of other closed landfill facilities.
Position: Environmental Scientist
Assigned Tasks: Advise the client on Environmental authorisation requirements

Basic Assessment for the Sasol C3 Expansion Project, Sasol Industrial Complex, South Africa
Start Date: 2013
Client Name: Sasol Polymers
Project Value: R 267,614
The C3 expansion project was initiated to address an estimated 105ktpa additional propylene that will be

available in 2014 as a result of various optimisation projects on the upstream Sasol Synfuels facilities. An opportunity was identified for the additional propylene to be utilised as feed for the polypropylene (PP) plants, namely PP1 and PP2. The C3 expansion project involves upgrading and implementing changes to the existing PP1 and PP2 process equipment to accommodate the increase in throughput.
Position: Project Principal
Assigned Tasks: Strategic project advice, quality review and approval of reports

BA for the Sasol Iso-Octanol Long Term Phase II Project, Sasol Industrial Complex, South Africa
Start Date: 2012
Client Name: Sasol Technology (Pty) Ltd
Project Value: R 261,184
The Iso-octanol long-term phase 2 project involves a process whereby aldehydes are converted in the existing Iso-alcohol stream (in Octene Train III) by hydrogenation to its corresponding alcohols to achieve the desired product specification for the Iso-octanol product. A new reactor and a new distillation column with its associated equipment will be installed for this purpose. The expected Iso-octanol production will range between 7 and 9kt/annum. In addition, a storage tank with a capacity of approximately 400m3 and a loading pump will be installed to enable storage and loading of the final Iso-octanol product.
Position: Project Principal
Assigned Tasks: Strategic project advice, quality review and approval of reports

Environmental Impact Assessment for the C3 Stabilisation Project situated on the Sasol Secunda Site, South Africa
Start Date: 2010
Client Name: Sasol Technology (Pty) Ltd
Project Value: R 447,172.00
Environmental Impact Assessment for the C3 Stabilisation Project situated on the Sasol Secunda Site
Position: Project Manager
Assigned Tasks: Project Management, review and compilation of EIA documentation, management of public process, liaise with client and authorities

Environmental Impact Assessment for the proposed Biogas to Power Plant Project at Sasol Synfuels, South Africa
Start Date: 2009
Client Name: Sasol Technology (Pty) Ltd
Project Value: R 167,865
Basic assessment study for the Biogas to power plant project.
Position: Project Manager
Assigned Tasks: Project management, compilation of environmental reports

Environmental Impact Assessment for the proposed Sasol Bioworks upgrade, South Africa
Start Date: 2008
Client Name: Sasol Technology (Pty) Ltd
Project Value: R306,101 Sasol One Bioworks Expansion
Position: Project Manager
Assigned Tasks: Overall Project Management and quality control

EIA or the Amendment of Mining Right for the UCG Pilot Plant, South Africa
Start Date: 2008
Client Name: Sasol Technology (Pty) Ltd
Project Value: R 404,000
Environmental Impact Assessment and Mining Authorisation for the Underground Coal Gasification Pilot Project located in Secunda Mpumalanga Province.
Position: Project Manager
Assigned Tasks: Overall Project Management and quality control

Department of Public Works: ECO Work in Pretoria, South Africa
Start Date: 2010 - 2017
Client Name: Department of Public Works
Project Value: R 2,100,000
Environmental Control Officer and Occupational Health and Safety for the demolition activities associated with the HG de Witt Building in Pretoria.
Position: Project Manager
AssignedTasks: Project Managementand Environmental Control Officer (ECO) work

AEL OEMPr Compilation
Start Date: 2019
Client Name: AEL Africa
Project Value: R 100,000
Position: Senior Environmental Scientist
Assigned Tasks: Compilation of OEMPr for the ISAP and Nitrate Plant

Environmental Status Quo for the Scottsville Local Area Plan
Start Date: 2018
Client Name: Msunduzi Municipality
Project Value: R 2.5 million
Position: Environmental Scientist
Assigned Compilation of Environmental Status Quo chapter

White Mfolozi Bridge & Link Road, South Africa
Start Date: 2016
Client Name: Kwa-Zulu Natal Department of Transport
Project Value: R 0.8 million
Position: EAP
Assigned Tasks: Compilation of the Basic Assessment Report and EMPr in support of the necessary Environmental Authorisations and permits

Sundumbili Wastewater Treatment Works, South Africa
Start Date: 2015
Client Name: Ilembe Municipality
Project Value: R2 000 000
Position: EAP
Assigned Tasks: Environmental Screening and Environmental Impact Assessment

Rustenburg Integrated Rapid Public Transport Network (IRPTN), South Africa
Start Date: 2009
Client Name: Rustenburg Local Municipality
Project Value: R 3,000,000,000
Planning, design and implementation of the Rustenburg Rapid Transport project in Rustenburg.
The final system, which will consist of several phases, will compromise of approximately 900 busses, 600 kilometres (km), 50 bus routes, 35 km segregated bus lanes, 30 stations, 3 depots, 1 transport management centre, and zero compromise in public transport service quality. Royal HaskoningDHV are the project managers in charge of the Design and Construction, as well as the designers for the Intelligent Transportation Systems and Urban Traffic Control.
Position: Environmental Scientist
Assigned Tasks: Environmental Screening Investigation and Ad Hoc environmental advice

Previous Experience

2010 - 2012
SSI Engineers and Environmental Consultants (Pty) Ltd
Associate

2008 – 2010
SSI Engineers and Environmental Consultants (Pty) Ltd formerly known as Bohlweki Environmental (Pty) Ltd
Senior Environmental Consultant

2006 – 2008
Bohlweki Environmental (Pty) Ltd
Junior Environmental Consultant

2001 – 2006
Department of Agriculture
Senior Plant and Quality Control Officer

Royal HaskoningDHV

Appendix E:
Generic EMPr for a Transmission Powerline

REPORT

Generic Environmental Management Programme for the Development of a 400kV Loop-In-Loop-Out (LILO) Powerline to the Existing Eskom Garona Substation on Portions 4; 5; 9 and the Remaining Extent of the Farm Bokpoort 390, Groblershoop, !Kheis Local Municipality Ref: TBC

Environmental Management Programme

Client:	ACWA Power Project DAO (RF) (Pty) Ltd/Eskom Holdings SOC Ltd
Reference:	MD4195-RHD-ZZ-XX-RP-YE-001
Status:	01/Draft
Date:	14 July 2021

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Document title:	Generic Environmental Management Programme for Transmission Lines associated with the Development of a 400kV Loop-In-Loop-Out (LILO) Powerline to the Existing Eskom Garona Substation on Portions 4; 5; 9 and the Remaining Extent of the Farm Bokpoort 390, Groblershoop, !Kheis Local Municipality
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Project name:	MD4195
Project number:	MD4195
Author(s):	Prashika Reddy

Drafted by:	Prashika Reddy
Checked by:	Malcolm Roods
Date:	12.07.2021
Approved by:	Malcolm Roods
Date:	12.07.2021

Classification
Project related

Royal HaskoningDHV

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PART A – GENERAL INFORMATION

1 DEFINITIONS

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

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

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

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

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

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

The Method Statement shall cover applicable details with regard to:

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

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

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

Spoil means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

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

Works means the Works to be executed in terms of the Contract.

2 ACRONYMS AND ABBREVIATIONS

CA	Competent Authority
cEO	Contractors Environmental Officer
DFFE	Department of Forestry, Fisheries and the Environment
dEO	Developer Environmental Officer
DPM	Developer Project Manager
DSS	Developer Site Supervisor
EAR	Environmental Audit Report
ECA	Environmental Conservation Act No. 73 of 1989
ECO	Environmental Control Officer
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ERAP	Emergency Response Action Plan
EMPr	Environmental Management Programme Report
EAP	Environmental Assessment Practitioner
FPA	Fire Protection Agency
HCS	Hazardous chemical Substance
MSDS	Material Safety Data Sheet
NCDAERL	Northern Cape Department for Agriculture, Environmental Affairs, Rural Development and Land Reform
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act,2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
RI&AP's	Registered Interested and affected parties

This EMPr is based on the generic Environmental Management Programme for substation infrastructure for electricity transmission and distribution (Government Gazette No 42323, 22 March 2019), contemplated in Regulations 19(4), 23(4), and Appendix 4 to the Environmental Impact Assessment Regulations, 2014, as amended.

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

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities, and reporting lines within an institutional framework. Therefore, this section of the generic EMPr gives guidance to the various environmental roles and reporting lines.

Table 1: Guide to roles and responsibilities for implementation of a generic EMPr

Function	Role and Responsibilities
Developer's Project Manager (DPM)	<u>Role</u> The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Furthermore, where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving the mandate to enable the ECO to perform responsibilities. He must ensure that the ECO is integrated as part of the project team while remaining independent. <u>Responsibilities</u> ▪ Be fully conversant with the conditions of the EA; ▪ Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); ▪ Issuing of site instructions to the Contractor for corrective actions required; ▪ Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. ▪ Overall management of the project and EMPr implementation; and ▪ Ensure that periodic environmental performance audits are undertaken on the project implementation.
Developer Site Supervisor (DSS)	<u>Role</u> The DSS reports directly to the DPM, oversees site works, liaises with the Contractor(s) and the ECO. The DSS is responsible for the day-to-day implementation of the EMPr and for ensuring the

Function	Role and Responsibilities
	compliance of all contractors with the conditions and requirements stipulated in the EMPr. Responsibilities ▪ Ensure that all Contractors identify a contractor's Environmental Officer (cEO); ▪ Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM, and ECO; ▪ Must ensure that all landowners have the relevant contact details of the site staff, ECO, and cEO; ▪ Issuing of site instructions to the Contractor for corrective actions required; ▪ Will issue all non-compliances to contractors; and ▪ Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO)	Role The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, contractor Environmental Officer (cEO), and developer Environmental Officer (dEO) are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications set out in the EA and EMPr. The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications, and requirements that have a cost implication (i.e., those deemed to be a variation

Function	Role and Responsibilities
	not allowed for in the Performance Specification) must be endorsed by the Project Manager. As specified by the EA, the ECO must report to the relevant CA as and when required. <u>Responsibilities</u> The responsibilities of the ECO will include the following: ▪ Be familiar with the recommendations and mitigation measures of this EMPr; ▪ Be conversant with relevant environmental legislation, policies, and procedures, and ensure compliance with them; ▪ Undertake regular and comprehensive site inspections/ audits of the construction site according to the generic EMPr and applicable licenses to monitor compliance as required; ▪ Educate the construction team about the management measures contained in the EMPr and environmental licenses; ▪ Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; ▪ Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; ▪ In consultation with the Developer Site Supervisor, order the removal of person(s) and/ or equipment which are in contravention of the specifications of the EMPr and/ or environmental licenses; ▪ Liaison between the DPM, Contractors, authorities, and other lead stakeholders on all environmental concerns; ▪ Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; ▪ Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); ▪ Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions, etc.) as well as corrective and preventive actions taken; ▪ Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken;

Function	Role and Responsibilities
	▪ Assisting in the resolution of conflicts; ▪ Facilitate training for all personnel on the site – this may range from carrying out the training to reviewing the training programmes of the Contractor; ▪ In case of non-compliance, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; ▪ Maintenance, update, and review of the EMPr; ▪ Communication of all modifications to the EMPr to the relevant stakeholders.
developer Environmental Officer (dEO)	<u>Role</u> The dEO will report to the Project Manager and are responsible for the implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners, and a range of environmental coordination responsibilities. <u>Responsibilities</u> ▪ Be fully conversant with the EMPr; ▪ Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; ▪ Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s); ▪ Confine the development site to the demarcated area; ▪ Conduct internal environmental audits with regards to EMPr and authorisation compliance (on cEO); ▪ Assist the contractors in addressing environmental challenges on-site; ▪ Assist in incident management: ▪ Reporting environmental incidents to the developer and ensuring that corrective action is taken and lessons learned shared;

Function	Role and Responsibilities
	▪ Assist the Contractor in investigating environmental incidents and compile investigation reports; ▪ Follow-up on pre-warnings, defects, non-conformance reports; ▪ Measure and communicate environmental performance to the Contractor; ▪ Conduct environmental awareness training on-site together with ECO and cEO; ▪ Ensure that the necessary legal permits and/ or licenses are in place and up to date; ▪ Acting as Developer's Environmental Representative on-site and work together with the ECO and Contractor.
Contractor	<u>Role</u> The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities per their contract with the Project Developer. In addition, the contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion for overhead electricity transmission and distribution infrastructure activities. <u>Responsibilities</u> ▪ Project delivery and quality control for the construction services as per appointment; ▪ Employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; ▪ Ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is operated correctly and maintained to facilitate proper access and enable any operation to be carried out safely; ▪ Attend on-site meeting(s) prior to the commencement of construction activities to confirm the construction procedure and designated activity zones; ▪ Ensure that Contractors' staff (or sub-contractors) repair, at their own cost, any environmental damage resulting from a contravention of the specifications contained in the EMPr to the

Function	Role and Responsibilities
	satisfaction of the ECO.
contractor Environmental Officer (cEO)	<u>Role</u> Each Contractor affected by the EMPr should appoint a cEO responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent, site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/ he can interact effectively with other site Contractors, labourers, the Environmental Control Officer, and the public. As a minimum, the cEO shall meet the following criteria: <u>Responsibilities</u> ▪ Be on-site throughout the project and be dedicated to the project; ▪ Ensure all their staff are aware of the environmental requirements, conditions, and constraints concerning all of their activities on-site; ▪ Implementing the environmental conditions, guidelines, and requirements as stipulated within the EA, EMPr, and Method Statements; ▪ Attend the Environmental Site Meeting; ▪ Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; ▪ Report back formally on the completion of corrective actions; ▪ Assist the ECO in maintaining all the site documentation; ▪ Prepare the site inspection reports and corrective action reports for submission to the ECO; ▪ Assist the ECO with the preparing of the monthly report; and ▪ Where more than one Contractor is undertaking work on-site, each company appointed as a Contractor will appoint a cEO representing that company.

4 ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

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

4.1 Document Control/ Filing System

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

4.2 Documentation to be Available

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

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

4.3 Weekly Environmental Checklist

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

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

4.4 Environmental Site Meetings

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

4.5 Required Method Statements

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

The Method Statement shall cover applicable details with regard to:

- Development procedures;
- Materials and equipment to be used;
- Getting the equipment to and from the site;
- How the equipment/ material will be moved while on-site;
- How and where the 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 generic EMPr; and
- Any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following Method Statements to the Project Manager no less than 14 days prior to the programmed commencement date of the subject works or activity:

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

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

4.6 Environmental Incident Log (Diary)

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

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

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

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

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible Contractor by the ECOs via the Developer's Site Supervisor or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the generic EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended/ required corrective action; and
- Date by which the corrective action to be completed.

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

4.8 Corrective Action Records

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

4.9 Photographic Record

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

The Contractor shall:

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

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

- Pictures of all areas designated as work areas, camp areas, development sites, and storage areas taken before these areas are set up;
- All bunding and fencing;
- Road conditions and road verges;
- Condition of all farm fences;
- Topsoil storage areas;
- All areas to be cordoned off during construction;
- Waste management sites;
- Ablution facilities (inside and out);
- Any non-conformances deemed to be "significant";
- All completed corrective actions for non-compliance;
- All required signage;
- Photographic recordings of incidents;
- All areas before, during, and post-rehabilitation; and

- Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints Register

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

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

4.11 Claims for Damages

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

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

4.12 Interactions with Affected Parties

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

The ECOs shall:

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

4.13 Environmental Audits

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

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

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

4.14 Final Environmental Audits

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

PART B: SECTION 1

5 IMPACT MANAGEMENT OUTCOMES AND ACTIONS

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

The template provided below is completed by providing the information under each heading for each environmental impact management action. The completed template must be signed and dated on each page by both the Contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the Contactor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

5.1 Environmental Awareness Training

Management Outcome: All onsite staff are aware and understand the individual responsibilities in terms of this EMPr.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All staff must receive environmental awareness training; – The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; – Refresher environmental awareness training is available as and when required; – All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; – All staff are made aware of their individual roles and responsibilities in achieving compliance with the environmental authorisation and EMPr; – The Contractor must erect and maintain information posters at key locations on-site, and the posters must include the following information as a minimum: a) Safety notifications; and b) No littering. – Environmental awareness training must include as a minimum the following:	DPM	Environmental awareness training and weekly toolbox talks	ECO	Monthly	Record of attendance to awareness training and toolbox talks must be filed in the Site Environmental File

Management Outcome: All onsite staff are aware and understand the individual responsibilities in terms of this EMPr.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. – A record of all environmental awareness training courses undertaken as part of the EMPr must be available; – Educate workers on the dangers of open and/ or unattended fires; – A staff attendance register of all staff to have received environmental awareness training must be available.					

Management Outcome: All onsite staff are aware and understand the individual responsibilities in terms of this EMPr.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Course material must be available and presented in appropriate languages that all staff can understand.					

5.2 Site Establishment Development

Management Outcome: Impacts on the environment are minimised during site establishment, and the development footprint is kept to the demarcated development area.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– A Method Statement must be provided by the Contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and laydown areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment	Contractor & cEO	Method Statement for site establishment and layout plan	ECO	Once-off approval of method statement On-going monitoring of implementation	Approved Method Statement and layout plan Environmental checklists and reports

Management Outcome: Impacts on the environment are minimised during site establishment, and the development footprint is kept to the demarcated development area.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; – Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walkthrough; – Sites must be located where possible on previously disturbed areas; – The camp must be fenced in accordance with ***Section 5.5: Fencing and Gate Installation;*** and – The use of existing accommodation for contractor staff, where possible, is encouraged.					

5.3 Access Restricted Areas

Management Outcome: Access to restricted areas prevented.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Identification of restricted access areas is to be informed by the environmental assessment, site walkthrough, and any additional areas identified during development; – Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any restricted access area, colour coding could be used if appropriate; and – Unauthorised access and development-related activity inside restricted access areas are prohibited.	Contractor & cEO	Demarcation of Access restricted areas and staying within approved areas for construction	ECO & dEO	Once-off identification of restricted access areas On-going monitoring of implementation	Clearly marked restricted access areas Site inspection of No-Go areas

5.4 Access Roads

Management Outcome: Minimise impact on the environment through the planned and restricted movement of vehicles on site.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area; – An access agreement must be formalised and	Contractor	Access roads must be identified, and agreements	ECO	Monthly	Access road inspection

Management Outcome: Minimise impact on the environment through the planned and restricted movement of vehicles on site.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
signed by the DPM, Contractor, and landowner before commencing with the activities; – The access roads to tower positions must be signposted after access has been negotiated and before the commencement of the activities; – All private roads used for access to the servitude must be maintained and, upon completion of the works, be left in at least the original condition; – All Contractors must be made aware of all these access routes; – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the Contractor's expense; – Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; – In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with ***Section 4.9: Photographic Record***; prior to use and the condition thereof agreed by the landowner, the DPM, and the Contractor; – Access roads in flattish areas must follow fence lines		formalised before commencing construction			

Management Outcome: Minimise impact on the environment through the planned and restricted movement of vehicles on site.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
and tree belts to avoid fragmentation of vegetated areas or croplands; and – Access roads must only be developed on pre-planned and approved roads.					

5.5 Fencing and Gate Installation

Management Outcome: Minimise impact on the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Use existing gates provided to gain access to all parts of the area authorised for development, where possible; – Existing and new gates to be recorded and documented in accordance with ***Section 4.9: Photographic Record***; – All gates must be fitted with locks and be kept locked at all times during the development phase unless otherwise agreed with the landowner; – -At points where the line crosses a fence in which	Contractor	Controlled access to working areas	dEO & ECO	Monthly	Site inspection

Management Outcome: Minimise impact on the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; – Care must be taken that the gates must be so erected that there is a gap of no more than 100mm between the bottom of the gate and the ground; – Where gates are installed in jackal-proof fencing, a suitably reinforced concrete sill must be provided beneath the gate; – Original tension must be maintained in the fence wires; – All gates installed in electrified fencing must be re-electrified; – All demarcation fencing and barriers must be kept in good working order for the duration of overhead transmission and distribution electricity infrastructure development activities; – Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where appropriate and would not cause harm to the					

Management Outcome: Minimise impact on the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
sensitive flora; – Any temporary fencing to restrict the movement of life-stock must only be erected with the landowner's permission. – All fencing must be developed of high-quality material bearing the SABS mark; – The use of razor wire as fencing must be avoided; – Fenced areas with gate access must remain locked after hours, during weekends, and on holidays if staff is away from the site. Site security will be required at all times; – On completion of the development phase, all temporary fences are to be removed; and – The Contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.					

5.6 Water Supply Management

Management Outcome: Undertake responsible water usage.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All abstraction points or boreholes must be registered with the DHSW&S and suitable water meters installed to ensure that the abstracted volumes are measured daily; – The Contractor must ensure the following: a) The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b) No damage occurs to the riverbed or banks, and that the abstraction of water does not entail stream diversion activities; and c) All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. – Ensure water conservation is being practiced by: a) Minimising water use during cleaning of equipment; b) Undertaking regular audits of water systems; c) Including a discussion on water usage and conservation during environmental awareness training; and d) The use of greywater is encouraged.	Contractor	Water from appropriately licensed sources Environmental awareness training	ECO & dEO	Monthly	Site inspection

5.7 Storm and Wastewater Management

Management Outcome: Impacts to the environment caused by stormwater and wastewater discharges during construction are avoided.

Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency	Evidence of Compliance
– Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored, and either treated or disposed of off-site, at a location approved by the Project Manager; – All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; – Natural stormwater runoff not contaminated during the development, and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; – Water contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once suspended solids have been removed from the water by settling these solids in settlement ponds. The release of settled water back into the environment must be subject	Contractor, PM & cEO	Method Statement for stormwater and wastewater management	ECO & dEO	Monthly	Site inspection Approved Method Statement

Management Outcome: Impacts to the environment caused by stormwater and wastewater discharges during construction are avoided.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
to the Project Manager's approval and support by the ECO.					

5.8 Solid and Hazardous Waste Management

Management Outcome: Wastes are appropriately stored, handled, and safely disposed of at a recognised waste facility.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All measures regarding waste management must be undertaken using an integrated waste management approach; – Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; – A suitably positioned and clearly demarcated waste collection site must be identified and provided; – The waste collection site must be maintained in a clean and orderly manner; – Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal;	Contractor & cEO	General camp house-keeping Provision of bins Awareness training on waste minimisation and re-use	dEO ECO	Weekly Bi-monthly	Provision of waste disposal facilities (bins & skips) Proof of Safe Disposal Certificates

Management Outcome: Wastes are appropriately stored, handled, and safely disposed of at a recognised waste facility.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Staff must be trained in waste segregation; – Bins must be emptied regularly; – General waste produced onsite must be disposed of at registered waste disposal sites/ recycling companies; – Hazardous waste must be disposed of at a registered waste disposal site; – Certificates of safe disposal for general, hazardous, and recycled waste must be maintained.					

5.9 Protection of Watercourses and Estuaries

Management Outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils fuels, chemicals, aggregate tailings, wash, and contaminated water or organic material resulting from the Contractor's activities; – In the event of a spill, prompt action must be taken to clear the polluted or affected areas;	Contractor & cEO	Method Statement for Working in Watercourses (if applicable)	dEO ECO	Weekly Bi-monthly	Approval and compliance with the Method Statement

Management Outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Where possible, no development equipment must traverse any seasonal or permanent wetland; – No return flow into the estuaries must be allowed, and no disturbance of the Estuarine functional Zone should occur; – Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; – There must not be any impact on the long-term morphological dynamics of watercourses or estuaries; – Existing crossing points must be favoured over the creation of new crossings (including temporary access); – When working in or near any watercourse or estuary, the following environmental controls and considerations must be taken: a) Water levels during the period of construction; No altering of the bed, banks, course, or characteristics of a watercourse; b) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment					(if applicable)

Management Outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
must be implemented, e.g., including ensuring that construction equipment is well maintained; c) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e., sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and d) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.					

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5.10 Vegetation Clearing

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
General: – Indigenous vegetation which does not interfere with the development must be left undisturbed; – Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; – Search, rescue, and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing; – Permits for removal must be obtained from the Department of Forestry, Fisheries and the Environment (DFFE) prior to the cutting or clearing of the affected species, and they must be filed; – The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals; – Trees felled due to construction must be documented and form part of the Environmental Audit Report;	Contractor & cEO	Woking within demarcated areas Invasive Alien Plant (IAP) eradication and control	dEO ECO	Weekly Monthly	Site inspection

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Rivers and watercourses must be kept clear of felled trees, vegetation cuttings, and debris; – Only a registered pest control operator may apply herbicides on a commercial basis, and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; – A daily register must be kept of all relevant details of herbicide usage; – No herbicides must be used in estuaries; – All protected species and sensitive vegetation not removed must be clearly marked, and such areas fenced off in accordance with ***Section 5.3: Access Restricted Areas***. **Servitude:** – Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager;					

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Where clearing for access purposes is essential, the maximum width to be cleared within the servitude must be in accordance to distance as agreed between the landowner and the EA holder; – Alien invasive vegetation must be removed according to a plan (in line with relevant municipal and provincial procedures, guidelines, and recommendations) and disposed of at a recognised waste disposal facility; – Vegetation must be trimmed where it is likely to intrude on the minimum vegetation clearance distance (MVCD) or will intrude on this distance before the next scheduled clearance. – MVCD is determined from SANS 10280; – Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility unless the landowners wish to retain the cut vegetation; – In the case of the development of new overhead transmission and distribution infrastructures, one metre "trace-line" must be cut through the vegetation for stringing purposes only, and no vehicle access must be cleared along the "trace-line"; and					

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Alternative methods of stringing that limit the impact on the environment must always be considered.					

5.11 Protection of Fauna

Management Outcome: Disturbance to fauna is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; – The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme; – Breeding sites must be kept intact, and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present; – Nesting sites on existing parallel lines must be	Contractor & cEO	Awareness training Injuring, capturing, killing of fauna identified on site must be reported	dEO & ECO	Monthly	Training material related to faunal management

Management Outcome: Disturbance to fauna is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
documented; – Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; – Bird guards and diverters must be installed on the new line as per the recommendations of the specialist; – No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas; – No deliberate or intentional killing of fauna is allowed; – In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted, and causing power outages; and – No Threatened or Protected species (ToPs) and/ or protected fauna as listed according to NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/ or relocated without appropriate authorisations/ permits.					

5.12 Protection of Heritage Resources

Management Outcome: Impact to heritage resources is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Identify, demarcate and prevent impact to all known sensitive heritage features on-site in accordance with the No-Go procedure in ***Section 5.3: Access Restricted Areas***; – Carry out general monitoring of excavations for potential fossils, artifacts, and material of heritage importance; – All work must cease immediately if any human remains and/ or other archaeological, palaeontological, and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services) so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/ collect such material before development recommences.	Contractor & cEO	Working within approved areas for construction	dEO & ECO	Monthly	Site inspection

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5.13 Safety of the Public

Management Outcome: All precautions are taken to minimise the risk of injury, harm, or complaints.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Identify fire hazards, demarcate and restrict public access to these areas, as well as notify the local authority of any potential threats, e.g., large brush stockpiles, fuels, etc.; – All unattended open excavations must be adequately fenced or demarcated; – Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; – Ensure structures vulnerable to high winds are secured; and – Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.	Contractor	Compilation of Health and Safety Plan Maintain Health and Safety File	Occupation Health & Safety Officer	Monthly	Health and safety inspections Investigation of major accident/ incidents

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5.14 Sanitation

Management Outcome: Clean and well-maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Mobile chemical toilets are installed onsite if no other ablution facilities are available; – The use of ablution facilities and or portable toilets must be used at all times, and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances; – Where mobile chemical toilets are required, the following must be ensured: a) Toilets are located no closer than 100m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c) No spillage occurs when the toilets are cleaned or emptied, and the contents are managed in accordance with the EMPr; d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out; e) Toilets are emptied before long weekends	Contractor	Provision of Ablution facilities during construction Management of facilities	dEO ECO	Weekly Monthly	Proof of servicing and safe disposal

Management Outcome: Clean and well-maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
and workers holidays and must be locked after working hours; f) Toilets are serviced regularly, and the ECO must inspect toilets to ensure compliance to health standards; and – A copy of the waste disposal certificates must be maintained.					

5.15 Prevention of Disease

Management Outcome: All necessary precautions linked to the spread of disease are taken.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Undertake environmentally-friendly pest control in the camp area; – Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; – The Contractor must ensure that information posters on AIDS are displayed in the Contractor camp area;	Contractor	Compilation of Health and Safety Plan Maintain Health and Safety File	Occupation Health & Safety Officer	Monthly	Health and safety inspections

Management Outcome: All necessary precautions linked to the spread of disease are taken.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; – Free condoms must be made available to all staff on-site at central points; – Medical support must be made available; and – Provide access to Voluntary HIV Testing and Counselling Services.					

5.16 Emergency Procedures

Management Outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; – The Emergency Plan must deal with accidents, potential spillages, and fires in line with relevant legislation;	Contractor	ERAP Awareness Training	ECO	Monthly	Approved ERAP & training records

Management Outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All staff must be made aware of emergency procedures as part of environmental awareness training; – The relevant local authority must be made aware of a fire as soon as it starts; – In an emergency, necessary mitigation measures to contain the spill or leak must be implemented ***(Section 5.17: Hazardous Substances)***.					

5.17 Hazardous Substances

Management Outcome: Safe storage, handling, use, and disposal of hazardous substances.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; – All hazardous substances must be stored in suitable containers as defined in the Method Statement; – Containers must be clearly marked to indicate	Contractor	Method Statement for the handling, storage, use, and disposal	ECO	Monthly	Site inspection of hazardous storage areas

Management Outcome: Safe storage, handling, use, and disposal of hazardous substances.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
contents, quantities, and safety requirements; – All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill/ leak from the stored containers; – Bunded areas to be suitably lined with a SABS approved liner; – An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date continuously; – All hazardous chemicals that will be used on-site must have Material Safety Data Sheets (MSDS); – All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; – Employees handling hazardous substances/ materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available; – The Contractor must ensure that diesel and other liquid fuel, oil, and hydraulic fluid is stored in appropriate storage tanks or bowsers; – The tanks/ bowsers must be situated on a smooth, impermeable surface (concrete) with a		of hazardous substances			and inspection of drip trays and impervious surfaces

Management Outcome: Safe storage, handling, use, and disposal of hazardous substances.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
permanent bund. The impermeable lining must extend to the crest of the bund, and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall); – The floor of the bund must be sloped, draining to an oil separator; – Provision must be made for refuelling at the storage area by protecting the soil with an impervious ground cover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; – All empty externally dirty drums must be stored on a drip tray or within a bunded area; – No unauthorised access into the hazardous substances storage areas must be permitted; – No smoking must be allowed within the vicinity of the hazardous storage areas; – Adequate fire-fighting equipment must be made available at all hazardous storage areas; – Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used;					

Management Outcome: Safe storage, handling, use, and disposal of hazardous substances.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– An appropriately sized spill kit kept onsite relevant to the scale of the activity (ies) involving the use of hazardous substances must be available at all times; – The responsible operator must have the required training to make use of the spill kit in emergencies; – An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; – In the event of a spill, contaminated soil must be collected in containers and stored in a central location, and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to ***Section 5.7 for Storm and Wastewater Management*** and ***Section 5.8 for Solid and Hazardous Waste Management***.					

5.18 Workshop, Equipment Maintenance and Storage

Management Outcome: Soil, surface water, and groundwater contamination is minimized.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Where possible and practical, all maintenance of vehicles and equipment must take place in the workshop area; – When servicing vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; – Leaking equipment must be repaired immediately or be removed from the site to facilitate repair; – Workshop areas must be monitored for oil and fuel spills; – Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; – The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil/ water separator where maintenance work on vehicles and equipment can be performed; – Water drainage from the workshop must be contained and managed in accordance with	Contractor	Method Statement for the workshop, equipment maintenance, and storage	ECO	Monthly	Site inspection

Management Outcome: Soil, surface water, and groundwater contamination is minimized.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
Section 5.7: Storm and Wastewater Management.					

5.19 Batching Plants

Management Outcome: Minimise spillages and contamination of soil, surface water, and groundwater					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Concrete mixing must be carried out on an impermeable surface; – Batching plants areas must be fitted with a containment facility for the collection of cement-laden water. – Dirty water from the batching plant must be contained to prevent soil and groundwater contamination; – Bagged cement must be stored in an appropriate facility and at least 10m away from any watercourses, gullies, and drains; – A washout facility must be provided for washing concrete associated equipment. Water used for washing must be restricted; – Hardened concrete from the washout facility or	Contractor	Method Statement for batching activities	ECO	Monthly	Site inspection

Management Outcome: Minimise spillages and contamination of soil, surface water, and groundwater					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
concrete mixer can either be reused or disposed of at an appropriately licensed disposal facility; – Empty cement bags must be secured with adequate binding material if these will be temporarily stored on-site; – Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to ***Section 5.20: Dust Emissions***); – Any excess sand, stone, and cement must be removed or reused from the site on completion of the construction period and disposed at a registered disposal facility; and – Temporary fencing must be erected around batching plants in accordance with ***Section 5.5: Fencing and Gate Installation***.					

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5.20 Dust Emissions

Management Outcome: Dust prevention measures are applied to minimise the generation of dust.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; – Removal of vegetation must be avoided until soil stripping is required and similarly exposed surfaces must be revegetated or stabilised as soon as is practically possible; – Excavation, handling, and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; – During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate or whether working will cease altogether until the wind speed drops to an acceptable level; – Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; – Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO;	Contractor	Regular dust suppression Maintaining a dust suppression register	dEO ECO	Daily Monthly	Site inspection Dust suppression register Inspection of Complaints Register relating to dust

Management Outcome: Dust prevention measures are applied to minimise the generation of dust.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Vehicle speeds must not exceed 40km/h along dust roads or 20km/h when traversing unconsolidated and non-vegetated areas; – Straw stabilisation must be applied at a rate of one bale/ 10m² and harrowed into the top 100mm of top material for all completed earthworks; and – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.					

5.21 Blasting

Management Outcome: Impact to the environment is minimised through a safe blasting practice.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– A suitably licensed blasting contractor must conduct any blasting activity; and – Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours before such activity occurs on-site.	Contractor	Blasting Method Statement	ECO	Monthly	Blasting according to the Method Statement

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5.22 Noise

Management Outcome: Unnecessary noise is prevented by ensuring that noise from construction activities is mitigated.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– The Contractor must keep noise level within acceptable limits, – Restrict the use of sound amplification equipment for communication and emergency only; – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; – Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site daily for construction workers; – Develop a Code of Conduct for the construction phase in terms of the behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.	Contractor	Compliance with SANS 10103 and OHS Act	dEO ECO	Daily Monthly	Inspection of Complaints Register

5.23 Fire Prevention

Management Outcome: Prevention of uncontrollable fires.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Designate smoking areas where the fire hazard could be regarded as insignificant; – Firefighting equipment must be available on all vehicles located on-site; – The local Fire Protection Agency (FPA) must be informed of construction activities; – Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; – Two-way swop of contact details between ECO and FPA.	Contractor	Fire Prevention Plan	ECO	Monthly	Compliance with Fire Prevention Plan

5.24 Stockpiling and Stockpile Areas

Management Outcome: Erosion and sedimentation as a result of stockpiling are reduced.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored	Contractor	Method Statement to be	dEO ECO	Daily Bi-monthly	Site inspection and

Management Outcome: Erosion and sedimentation as a result of stockpiling are reduced.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
appropriately on-site to minimise impacts to watercourses, wetlands, and water bodies; – All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; – Stockpiles must not exceed 2m in height; – During periods of strong winds and heavy rain, the stockpiles should be covered with appropriate material (e.g., cloth, tarpaulin, etc.); – Where possible, sandbags (or similar) should be placed at the bases of the stockpiled material to prevent erosion of the material.		compiled for stockpile management			compliance with Method Statement

5.25 Finalising Tower Positions

Management Outcome: No environmental degradation occurs as a result of the survey and pegging operations.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– No vegetation clearing must occur during survey and pegging operations; – No new access roads must be developed to	PM Botanical specialist	Method Statement for survey and	dEO ECO	Once-off	Site inspection and

Management Outcome: No environmental degradation occurs as a result of the survey and pegging operations.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
facilitate access for survey and pegging purposes; – Project Manager, Botanical specialist, and Contractor to agree on final tower positions based on the survey within assessed and approved areas; – The surveyor is to demarcate (peg) access roads/ tracks in consultation with ECO. No deviations will be allowed without prior written consent from the ECO.	Contractor	pegging operations			compliance with Method Statement

5.26 Excavation and Installation of Foundations

Management Outcome: No environmental degradation occurs as a result of the excavation or installation of foundations.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All excess spoil generated during foundation excavation must be disposed of appropriately and at a recognised disposal site, if not used for backfilling purposes; – Spoil can, however, be used for landscaping purposes and must be covered with a layer of 150mm topsoil for rehabilitation purposes;	Contractor cEO	Method Statement for excavation and installation of foundations	dEO ECO	Daily Monthly	Site inspection Approved Method Statement

Management Outcome: No environmental degradation occurs as a result of the excavation or installation of foundations.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Management of equipment for excavation purposes must be undertaken in accordance with ***Section 5.18: Workshop Equipment Maintenance and Storage***; – Hazardous substance spills from equipment must be managed in accordance with ***Section 5.17: Hazardous Substances***. – Batching of cement to be undertaken in accordance with ***Section 5.19: Batching Plants***; – Residual cement must be disposed of in accordance with ***Section 5.8: Solid and Hazardous Waste Management***.					

5.27 Assembly and Erecting Towers

Management Outcome: No environmental degradation occurs as a result of the assembly and erecting of towers.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Prior to the erection, assembled towers and tower sections must be stored on an elevated surface (suggest wooden blocks) to minimise damage to the underlying vegetation;	Contractor cEO	Method Statement for assembly and	ECO dEO	Bi-monthly	Site inspection

Management Outcome: No environmental degradation occurs as a result of the assembly and erecting of towers.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– In sensitive areas, tower assembly must take place off-site or away from sensitive positions; – The crane used for tower assembly must be operated in a manner that minimises impact to the environment; – The number of crane trips to each site must be minimised; – Wheeled cranes must be utilised in preference to tracked cranes; – Consideration must be given to erecting towers by helicopter or by hand where it is warranted to limit the extent of environmental impact; – Access to tower positions to be undertaken in accordance with access requirements specified in ***Section 8.4: Access Roads***; – Vegetation clearance to be conducted in accordance with general vegetation clearance requirements specified in ***Section 8.10: Vegetation Clearing***; – No levelling at tower sites must be permitted unless approved by the Development Project Manager or Developer Site Supervisor; – Topsoil must be removed separately from subsoil material and stored for later use during the		erection of towers			Approved Method Statement

Management Outcome: No environmental degradation occurs as a result of the assembly and erecting of towers.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
rehabilitation of such tower sites; – Topsoil must be kept in heaps not higher than 1m to prevent the destruction of the seed bank within the topsoil; – Excavated slopes must be no greater than 1:3, but where this is unavoidable, appropriate measures must be undertaken to stabilise the slopes; – Fly rock from blasting activity must be minimised, and any pieces greater than 150mm falling beyond the Working Area must be collected and removed; – Only existing disturbed areas are utilised as spoil areas; – Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum; – Surface water runoff is appropriately channelled through or around spoil areas; – During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that; – The surface of the spoil is appropriately rehabilitated in accordance with the requirements specified in ***Section 5.29: Landscaping and***					

Management Outcome: No environmental degradation occurs as a result of the assembly and erecting of towers.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
Rehabilitation; – The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect revegetation of such areas to prevent erosion as soon as construction activities on the site are complete. Spreading of topsoil must not be undertaken at the beginning of the dry season.					

5.28 Stringing

Management Outcome: No environmental degradation occurs as a result of stringing.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner must avoid Access restricted areas and other sensitive areas; – The winch and tensioner station must be equipped with drip trays to contain any fuel, hydraulic fuel, or oil spills and leaks; – Refuelling of the winch and tensioner stations must	Contractor cEO	Method Statement for stringing of towers	dEO ECO	Monthly	Site inspection Approved Method Statement

Management Outcome: No environmental degradation occurs as a result of stringing.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
be undertaken in accordance with ***Section 5.17: Hazardous Substances***; – In the development of overhead transmission and distribution infrastructure, one metre "trace-line" may be cut through the vegetation for stringing purposes only, and no vehicle access must be cleared along "trace-lines." – Vegetation clearing must be undertaken by hand, using chainsaws and hand-held implements, with the vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used; – Alternative methods of stringing which limit the impact to the environment must always be considered, e.g., by hand or by using a helicopter; – Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If for any reason, such access has to be closed for any period(s) during development, the persons affected must be given reasonable notice, in writing; – No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines, fences, etc.)					

Management Outcome: No environmental degradation occurs as a result of stringing.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing; – Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 workdays minimum), in writing, must be provided to the landowner; – Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high-value agricultural areas such as vineyards, orchards, nurseries.					

5.29 Socio-economic

Management outcome: Socio-economic development is enhanced.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Develop and implement communication strategies to facilitate public participation; – Develop and implement a collaborative and	Contractor	Stakeholder engagement plan	ECO	Bi-monthly	Site inspection

Management outcome: Socio-economic development is enhanced.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
constructive approach to conflict resolution as part of the external stakeholder engagement process; – Sustain continuous communication and liaison with neighbouring owners and residents; – Create work and training opportunities for local stakeholders; and – Where feasible, no workers, except for security personnel, must be permitted to stay overnight on the site. This would reduce the risk to local farmers.		Communication plan			Approved Stakeholder Engagement and communication plan

5.30 Temporary Site Closure

Management Outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in ***Sections 5.17: Management of Hazardous Substances and***	Contractor cEO	Method Statement for site closure	ECO dEO	Bi-monthly	Site inspection

Management Outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
5.18 Workshop, Equipment Maintenance and Storage; – Hazardous storage areas must be well ventilated; – Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; – Emergency and contact details displayed must be displayed; – Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; – Night hazards such as reflectors, lighting, traffic signage, etc. must have been checked; – Fire hazards identified, and the local authority must have been notified of any potential threats, e.g., large brush stockpiles, fuels, etc.; – Structures vulnerable to high winds must be secured; – Wind and dust mitigation must be implemented; – Cement and materials stores must have been secured; – Toilets must have been emptied and secured; – Refuse bins must have been emptied and secured; – Drip trays must have been emptied and secured.		greater than five (5) days			Approved Method Statement

5.31 Landscaping and Rehabilitation

Management Outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed to a registered waste site and certificates of disposal provided; – All slopes must be assessed for contouring and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; – All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; – Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition; – Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping, which must be agreed to by the holder of the EA and the landowners; – Rehabilitation of tower sites and access roads	Contractor cEO	Method Statement for landscaping and rehabilitation	ECO dEO	Monthly	Site inspection Approved Method Statement

Management Outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
outside of farmland; – Indigenous species must be used for with species and/ grasses to where it compliments or approximates the original condition; – Stockpiled topsoil must be used for rehabilitation (refer to ***Section 5.24: Stockpiling and Stockpiled Areas***); – Stockpiled topsoil must be evenly spread to facilitate seeding and minimise loss of soil due to erosion; – Before placing topsoil, all visible weeds from the placement area and the topsoil must be removed; – Subsoil must be ripped before topsoil is placed; – The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; – Where impacted through construction-related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments.					

Management Outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– The contract design specifications must be adhered to and implemented strictly; – Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. Where required, re-vegetation, including hydro-seeding, can be enhanced using a vegetation seed mixture as described below. A mixture of seeds can be used provided the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area.					

6 ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with regulation 26 (h) of the Environmental Impact Assessment Regulations, 2014 as amended.

PART B: SECTION 2

7 SITE-SPECIFIC INFORMATION AND DECLARATION

7.1 Sub-section 1: Contact Details and Description of the Project

7.1.1 Details of the applicant:

Name of applicant: **Mr Itumeleng Moeng**
E-mail address: **Moengl@eskom.co.za**
Tel No: (**011) 8004114**
Fax No: **+27 86 665 2128**
Postal Address: **P O Box 1091, Sunninghill. Johannesburg, 2157**
Physical Address: **1 Maxwell Drive, Megawatt Park, Sunninghill, Johannesburg, 2157**

7.1.2 Details and expertise of the EAP:

Name of applicant: **Prashika Reddy (Royal HaskoningDHV)**
E-mail address: **prashika.reddy@rhdhv.com**
Tel No: **087 352 1577**
Fax No: **Not applicable**
The expertise of the EAP (Curriculum Vitae included): **Prashika Reddy is a Senior Environmental Scientist with 19 years of experience in various environmental fields, including EIAs, EMPrs, PPP, and environmental monitoring and audits. She is/ has been part of numerous multi-faceted large-scale projects, including the establishment of linear developments (roads and powerlines), industrial plants, electricity generation plants, mixed-use developments, and mining projects. She is a Professional Natural Scientist (400133/10) with the South African Council for Natural Scientific Professions and a registered EAP with EAPASA.**

7.1.3 Project name:

The Development of a 400kV Loop-In-Loop-Out (LILO) Powerline to the Existing Eskom Garona Substation and Expansion/Upgrade of the Eskom Garona Substation on Portions 4; 5; 9 and the Remaining Extent of the Farm Bokpoort 390, Groblershoop, !Kheis Local Municipality

7.1.4 Description of the project:

Project DAO received a Cost Estimate Letter (CEL) from Eskom Holdings SOC Ltd (hereafter referred to as Eskom) as part of its solution towards the connection of the project to the National grid. The CEL indicated that additional strengthening of the Garona Substation will be required to fully handle the capacity which would have been generated by the project. This further aligns with Eskom's planned multiple-grid strengthening projects across the country, and due to the timelines, Eskom are not able to undertake the project. As such, ACWA Power Project DAO (RF) Pty Ltd will be undertaking the additional work as part of the self-build agreement between the two entities, after which the infrastructure will be handed over to Eskom for operations and maintenance.

The project consists of the following components:

- Loop-in to the existing Ferrum-Garona 400kV powerline to the Eskom Garona Substation;
- Loop-out into the existing Garona-Nieuwehoop 400kV powerline from the Eskom Garona Substation; and
- Upgrade and expansion of the Eskom Garona Substation to accommodate the additional electricity generated.

7.1.5 Project location:

The co-ordinates for the project are provided in Table 2.

Table 2: Project coordinates

Component		Co-ordinates	Property Description
Loop-in to the Ferrum-Garona 400kV powerline	1 (Start)	28°43'53.35"S; 22° 0'21.16"E	Farm Bokpoort 390 Remaining Extent Farm Bokpoort 390 Portion 4
	2	28°44'0.21"S; 22° 0'15.81"E	
	3 (Loop-in Point)	28°44'5.08"S; 22° 0'11.97"E	
	4 (Bend Point)	28°44'4.00"S; 22° 0'7.58"E	
	5 (Bend Point)	28°44'9.48"S; 21°59'58.23"E	
	6	28°44'12.25"S; 21°59'49.71"E	
	7 (End)	28°44'14.36"S; 21°59'43.40"E	
Loop-out into the Garona-Nieuwehoop 400kV powerline	1 (Start)	28°44'16.05"S; 21°59'44.08"E	Farm Bokpoort 390 Remaining Extent Farm Bokpoort 390 Portion 4 Farm Bokpoort 390 Potion 5 Farm Bokpoort 390 Portion 9
	2	28°44'12.86"S; 21°59'53.70"E	
	3 (Bend Point)	28°44'10.57"S; 22° 0'0.57"E	
	4 (Loop-out Point)	28°44'14.66"S; 22° 0'3.80"E	
	5	28°44'21.90"S; 21°59'57.41"E	
	6	28°44'28.90"S; 21°59'48.94"E	

7.2 Technical Description

7.2.1 400 kV Powerline

Table 3 shows the specifications for the 400kV powerline and tower structures provided by Eskom as the 400kV LILO powerline and tower structures will need to meet the design requirements to tie into the existing Ferrum-Garona and Garona-Nieuwehoop powerlines.

Table 3: 400kV powerline and tower specifications

Parameter	Specification
Length of the LILO powerlines	Approximately 1km
Average span between structures	360m
Tower structures: a self-supporting tower will need to be used for the tie in	517A Self-supporting (45 degrees) suspension tower Average footprint: 8.2. x 8.2m Average tower height: 26.9m

Parameter	Specification
	517E Self-supporting (0 – 35 degrees) strain tower, and 517F Self-supporting (35 – 60 degrees) strain and 0 degrees terminal tower Average footprint: 9.1m x 9.1m Average tower height: 27.5m
	518D Self-supporting (45 – 75 degrees) strain tower

7.2.2 *Servitude*

The servitude width for a 400kV powerline is 55m (27.5m on either side). The servitude is required to ensure the safe construction, maintenance, and operation of the line, thereby entitling Eskom Transmission Division to certain rights (e.g., unrestricted access). Where 400kV powerlines are constructed in parallel, a minimum separation distance of 55m is required to ensure the reliable operation of the lines.

The minimum vertical clearance to buildings, poles, and structures not forming part of the powerline must be 10.4m. Any farming activities can be practiced under the powerline, providing that safe working clearances and building restrictions are adhered to under all circumstances.

The minimum distance of a 400kV powerline structure from a proclaimed public road is between 60 and 120m (according to the road type), from the centre of the structure to the centre of the road servitude. In addition, the minimum distance between any part of a tree or shrub and any bare phase conductor of a 400kV powerline must be 10m.

Optimal tower sizes and positions will be identified and verified using a ground survey.

7.3 Sub-section 2: Development Footprint Site Map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. Once the web-based screening tool identified in regulation 16(1) (v) of the Environmental Impact Assessment Regulations, 2014 is available, the sensitivity map must be prepared from this system. The map indicates areas/ features of sensitivity based on the assessment findings and illustrated according to four tiers, Very High, High, Medium, or Low. The sensitivity map shall also identify the nature of each sensitive feature, e.g., raptor nest, threatened plant species, archaeological site, etc. Sensitivity maps shall identify features within the planned working area and any known sensitive features in the surrounding landscape. The overhead transmission and distribution profile shall be illustrated at an appropriate resolution to enable fine-scale interrogation. It is recommended that <20 m of overhead transmission and distribution length is illustrated per page in A3 landscape format. Where considered appropriate, photographs of sensitive features in the context of tower positions shall be used.

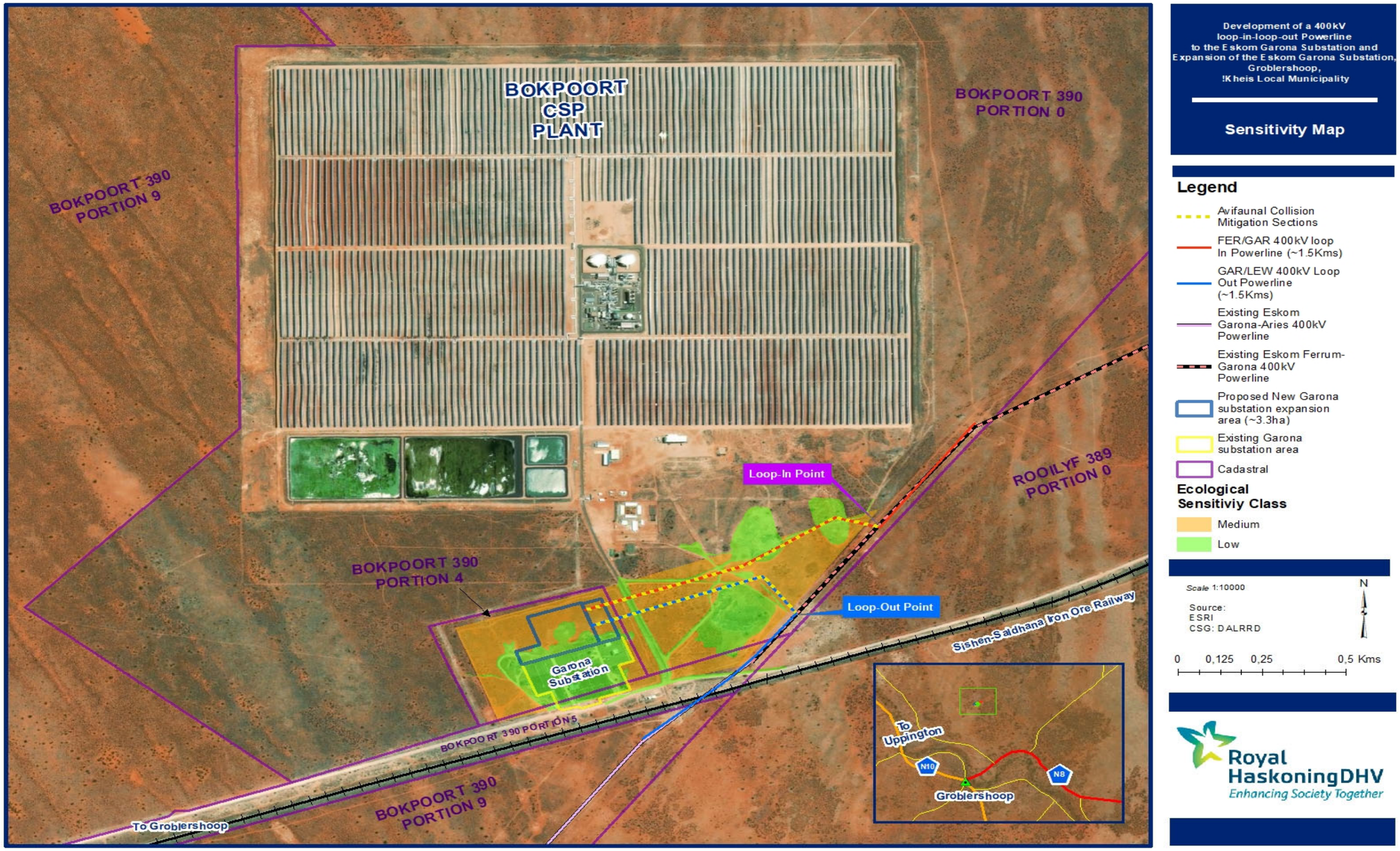

Figure 1: Sensitivity map

7.4 Sub-section 3: Declaration

The proponent or applicant or holder of EA affirms that they will abide and comply with the prescribed impact management outcomes and actions as stipulated in part B, section 1 of the generic EMPr and have the understanding that the impact management outcomes and actions are legally binding.

Signature Proponent/applicant/ holder of EA Date:

TO BE SIGNED IN THE FINAL SUBMISSION

Royal HaskoningDHV

PART C

8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

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

This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if Part C applies to the site, it must be submitted to the competent authority for approval before commencement of the activity. Once approved, Part C forms part of the EMPr for the site and is legally binding.

8.1 Vegetation Clearing

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure. All construction work must comply with the conditions of the relevant authorisations, licences, and permits.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Prior to site clearance, a detailed 'walkthrough' must be conducted to ascertain the number, abundance, and physical conditions of all protected tree species (*Acacia erioloba* (Camel Thorn), *Acacia haematoxylon* (Grey	Contractor & cEO Ecologist	Walkthrough DFFE and NCDAELR permits	dEO ECO	Once-off	All permits must be filed in the Site Environmental File

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure. All construction work must comply with the conditions of the relevant authorisations, licences, and permits.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
Camel Thorn), and *Boscia albitrunca* (Shepherd's Tree) were observed in the project area) to assist with the permit application (Department of Forestry, Fisheries and the Environment (DFFE)). ▪ A search and rescue operation should be performed prior to clearing; it should, however, be noted that this is not a feasible or practical option with regard to the protected trees. ▪ Prior to site clearance, conduct a detailed 'walkthrough' of the proposed site to ascertain the number, abundance, and physical conditions of all protected plant species and species of conservation concern to assist with the permit application (Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform - NCDAELR). ▪ A comprehensive Alien Invasive Plant removal programme and vegetation/ ecological monitoring programme must be drawn up and implemented. ▪ A biodiversity offset has been mandated for					

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure. All construction work must comply with the conditions of the relevant authorisations, licences, and permits.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
the Bokpoort Solar development to ensure that all residual impacts are associated with the development as a whole. A Biodiversity Offset Feasibility Investigation has been conducted and the recommendations made by the NCDAERL must be taken into account.					

8.2 Protection of Fauna (specifically Avifauna)

Management Outcome: Disturbance to fauna (specifically avifauna) is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Prior to construction, an avian specialist must conduct a site walkthrough, covering the final powerline routes to identify any nests/ breeding/ roosting activity of sensitive species, as well as any additional sensitive habitats. The results may inform the final construction schedule in close proximity to that specific area, including abbreviating construction time, scheduling activities around avian breeding and/ or	Contractor dEO Avian specialist	Walkthrough Training on Red Data avifauna species Implement a Bird Monitoring Programme	dEO ECO	Once-off Monthly	Walkthrough reports by Avian specialist Training records

Management Outcome: Disturbance to fauna (specifically avifauna) is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
movement schedules, and lowering associated noise levels. ▪ An avian specialist must conduct a site walkthrough of the final grid connection route and pylon positions prior to construction to determine if and where bird flight diverters (BFDs) are required. ▪ The appointed dEO must be trained by an avian specialist to identify the potential Red Data species and the signs that indicate possible breeding by these species. ▪ The dEO and ECO must then, during audits/ site visits, make a concerted effort to look out for such breeding activities of Red Data species. Such efforts may include the training of construction staff (e.g., in Toolbox talks) to identify Red Data species, followed by regular staff questioning regarding the regular whereabouts on site of these species. ▪ If any of the Red Data species are confirmed to be breeding (e.g., if a nest site is found), construction activities within					Bird Monitoring Reports

Management Outcome: Disturbance to fauna (specifically avifauna) is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
500m of the breeding site must cease, and an avian specialist must be contacted immediately for further assessment of the situation and instruction on how to proceed. ▪ The preferred pylon option from an avifaunal perspective would be whichever design achieves the lowest maximum height. ▪ Should guyed pylons be constructed, the supporting guy wires must be marked with suitable marking devices such as flappers or appropriate BFD. ▪ All new spans of overhead powerlines are to be fitted with appropriate bird flight diverters (i.e., on the earth wires) to reduce the risk of collisions. ▪ Where the grid connection power line runs adjacent to an existing line, new pylon positions should be staggered between existing pylons (where practically possible given the limitations of the design and engineering requirements) to increase the visibility of both lines to birds and further					

Management Outcome: Disturbance to fauna (specifically avifauna) is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
reduce the risk of collisions. ▪ An avian specialist must implement a construction phase bird monitoring programme to document potential impacts on key species such as korhaans, bustards, and eagles. ▪ Education and training and the enforcement of a strict policy against the killing of fauna.					

8.3 Protection of Heritage and Palaeontological Resources

Management Outcome: Impact to heritage and palaeontological resources is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ All discoveries must be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the ECO will advise the necessary actions to be taken. If heritage resources are	Contractor cEO Archaeologist Palaeontologist	Working within approved areas for construction	dEO & ECO	Once-off	Site inspection

Management Outcome: Impact to heritage and palaeontological resources is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA. ▪ If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/ Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule. ▪ If unmarked human burials are uncovered,					

Management Outcome: Impact to heritage and palaeontological resources is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/ Mimi Seetelo 012 320 8490) must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule. ▪ Known sites should be clearly marked in order that they can be avoided during construction activities. ▪ Under no circumstances shall any artefacts be removed, destroyed, or interfered with by anyone on the site. ▪ Contractors and workers must be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological, or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51(1).					

Appendix F:
Generic EMPr for a Substation

REPORT

Generic Environmental Management Programme for the Expansion/Upgrade of the Eskom Garona Substation on Portions 4; 5; 9 and the Remaining Extent of the Farm Bokpoort 390, Groblershoop, !Kheis Local Municipality

Environmental Management Programme

Client:	ACWA Power Project DAO (RF) (Pty) Ltd/Eskom Holdings SOC Ltd
Reference:	MD4195-RHD-ZZ-XX-RP-YE-001
Status:	01/Draft
Date:	14 July 2021

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Document title:	Generic Environmental Management Programme for Substations for the Expansion/Upgrade of the Eskom Garona Substation on Portions 4; 5; 9 and the Remaining Extent of the Farm Bokpoort 390, Groblershoop, !Kheis Local Municipality
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Date:	14 July 2021
Project name:	MD4195
Project number:	MD4195
Author(s):	Prashika Reddy

Drafted by:	Prashika Reddy
Checked by:	Malcolm Roods
Date:	12.07.2021
Approved by:	Malcolm Roods
Date:	12.07.2021

Classification
Project related

Royal HaskoningDHV

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PART A – GENERAL INFORMATION

1 DEFINITIONS

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

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

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

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

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

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

The Method Statement shall cover applicable details with regard to:

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

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

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

Spoil means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

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

Works means the Works to be executed in terms of the Contract.

2 ACRONYMS AND ABBREVIATIONS

CA	Competent Authority
cEO	Contractors Environmental Officer
DFFE	Department of Forestry, Fisheries and the Environment
dEO	Developer Environmental Officer
DPM	Developer Project Manager
DSS	Developer Site Supervisor
EAR	Environmental Audit Report
ECA	Environmental Conservation Act No. 73 of 1989
ECO	Environmental Control Officer
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ERAP	Emergency Response Action Plan
EMPr	Environmental Management Programme Report
EAP	Environmental Assessment Practitioner
FPA	Fire Protection Agency
HCS	Hazardous chemical Substance
MSDS	Material Safety Data Sheet
NCDAERL	Northern Cape Department for Agriculture, Environmental Affairs, Rural Development and Land Reform
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
SOP	Standard Operating Procedure

RI&AP's	Registered Interested and affected parties

This EMPr is based on the generic Environmental Management Programme for substation infrastructure for electricity transmission and distribution (Government Gazette No 42323, 22 March 2019), contemplated in Regulations 19(4), 23(4) and Appendix 4 to the Environmental Impact Assessment Regulations, 2014, as amended.

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

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities, and reporting lines within an institutional framework. This section of the generic EMPr gives guidance to the various environmental roles and reporting lines.

Table 1: Guide to roles and responsibilities for implementation of a generic EMPr

Function	Role and Responsibilities
Developer's Project Manager (DPM)	Role The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving the mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent. Responsibilities ▪ Be fully conversant with the conditions of the EA; ▪ Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); ▪ Issuing of site instructions to the Contractor for corrective actions required; ▪ Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. ▪ Overall management of the project and EMPr implementation; and ▪ Ensure that periodic environmental performance audits are undertaken on the project

Function	Role and Responsibilities
	implementation.
Developer Site Supervisor (DSS)	Role The DSS reports directly to the DPM, oversees site works, liaises with the Contractor(s) and the ECO. The DSS is responsible for the day-to-day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr. Responsibilities ▪ Ensure that all Contractors identify a contractor's Environmental Officer (cEO); ▪ Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM, and ECO; ▪ Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO; ▪ Issuing of site instructions to the Contractor for corrective actions required; ▪ Will issue all non-compliances to contractors; and ▪ Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO)	Role The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, contractor Environmental Officer (cEO) and developer Environmental Officer (dEO) are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and

Function	Role and Responsibilities
	EMPr. The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications, and requirements which have a cost implication (i.e., those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required. <u>Responsibilities</u> The responsibilities of the ECO will include the following: ▪ Be familiar with the recommendations and mitigation measures of this EMPr; ▪ Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; ▪ Undertake regular and comprehensive site inspections/ audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; ▪ Educate the construction team about the management measures contained in the EMPr and environmental licenses; ▪ Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; ▪ Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; ▪ In consultation with the Developer Site Supervisor, order the removal of person(s) and/ or

Function	Role and Responsibilities
	equipment which are in contravention of the specifications of the EMPr and/ or environmental licenses; ▪ Liaison between the DPM, Contractors, authorities, and other lead stakeholders on all environmental concerns; ▪ Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; ▪ Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); ▪ Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken; ▪ Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken; ▪ Assisting in the resolution of conflicts; ▪ Facilitate training for all personnel on the site – this may range from carrying out the training to reviewing the training programmes of the Contractor; ▪ In case of non-compliance, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; ▪ Maintenance, update and review of the EMPr; ▪ Communication of all modifications to the EMPr to the relevant stakeholders.
developer Environmental Officer (dEO)	<u>Role</u> The dEO will report to the Project Manager and are responsible for the implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners, as well as a range of environmental coordination responsibilities.

Function	Role and Responsibilities
	Responsibilities ▪ Be fully conversant with the EMPr; ▪ Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; ▪ Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s); ▪ Confine the development site to the demarcated area; ▪ Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO); ▪ Assist the contractors in addressing environmental challenges on site; ▪ Assist in incident management: ▪ Reporting environmental incidents to developer and ensuring that corrective action is taken and lessons learned shared; ▪ Assist the Contractor in investigating environmental incidents and compile investigation reports; ▪ Follow-up on pre-warnings, defects, non-conformance reports; ▪ Measure and communicate environmental performance to the Contractor; ▪ Conduct environmental awareness training on-site together with ECO and cEO; ▪ Ensure that the necessary legal permits and/ or licenses are in place and up to date; ▪ Acting as Developer's Environmental Representative on site and work together with the ECO and Contractor.
Contractor	Role The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method

Function	Role and Responsibilities
	Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the on-site activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion for overhead electricity transmission and distribution infrastructure activities. <u>Responsibilities</u> ▪ Project delivery and quality control for the construction services as per appointment; ▪ Employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; ▪ Ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained to facilitate proper access and enable any operation to be carried out safely; ▪ Attend on-site meeting(s) prior to the commencement of construction activities to confirm the construction procedure and designated activity zones; ▪ Ensure that Contractors' staff (or sub-contractors) repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the ECO.
contractor Environmental Officer (cEO)	<u>Role</u> Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/ he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public.

Function	Role and Responsibilities
	As a minimum the cEO shall meet the following criteria: <u>Responsibilities</u> ▪ Be on site throughout the duration of the project and be dedicated to the project; ▪ Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site; ▪ Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements; ▪ Attend the Environmental Site Meeting; ▪ Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; ▪ Report back formally on the completion of corrective actions; ▪ Assist the ECO in maintaining all the site documentation; ▪ Prepare the site inspection reports and corrective action reports for submission to the ECO; ▪ Assist the ECO with the preparing of the monthly report; and ▪ Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

4 ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

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

4.1 Document Control/ Filing System

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

4.2 Documentation to be Available

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

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

4.3 Weekly Environmental Checklist

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

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

4.4 Environmental Site Meetings

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

4.5 Required Method Statements

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

The Method Statement shall cover applicable details with regard to:

- Development procedures;
- Materials and equipment to be used;
- Getting the equipment to and from site;
- How the equipment/ material will be moved while on site;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Compliance/ non-compliance with the generic EMPr; and
- Any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following Method Statements to the Project Manager no less than 14 days prior to the programmed commencement date of the subject works or activity:

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

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

4.6 Environmental Incident Log (Diary)

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

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

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

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

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible Contractor by the ECOs via the Developer's Site Supervisor or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the generic EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended/ required corrective action; and
- Date by which the corrective action to be completed.

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

4.8 Corrective Action Records

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

4.9 Photographic Record

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

The Contractor shall:

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

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

- Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
- All bunding and fencing;
- Road conditions and road verges;
- Condition of all farm fences;
- Topsoil storage areas;
- All areas to be cordoned off during construction;
- Waste management sites;
- Ablution facilities (inside and out);
- Any non-conformances deemed to be "significant";
- All completed corrective actions for non-compliances;
- All required signage;

- Photographic recordings of incidents;
- All areas before, during and post rehabilitation; and
- Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints Register

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

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

4.11 Claims for Damages

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

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

4.12 Interactions with Affected Parties

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

The ECOs shall:

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

4.13 Environmental Audits

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

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

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

4.14 Final Environmental Audits

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

PART B: SECTION 1

5 IMPACT MANAGEMENT OUTCOMES AND ACTIONS

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

The template provided below is to be completed by providing the information under each heading for each environmental impact management action. The completed template must be signed and dated on each page by both the Contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the Contactor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

5.1 Environmental Awareness Training

Management Outcome: All on-site staff are aware and understands the individual responsibilities in terms of this EMPr.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All staff must receive environmental awareness training; – The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; – Refresher environmental awareness training is available as and when required; – All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; – All staff are made aware of their individual roles and responsibilities in achieving compliance with the environmental authorisation and EMPr; – The Contractor must erect and maintain information posters at key locations on site; and the posters must include the following information as a minimum: a) Safety notifications; and b) No littering. – Environmental awareness training must include as a minimum the following:	DPM	Environmental awareness training and weekly toolbox talks	ECO	Monthly	Record of attendance to awareness training and toolbox talks must be filed in the Site Environmental File

Management Outcome: All on-site staff are aware and understands the individual responsibilities in terms of this EMPr.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. – A record of all environmental awareness training courses undertaken as part of the EMPr must be available; – Educate workers on the dangers of open and/ or unattended fires; – A staff attendance register of all staff to have received environmental awareness training must be available.					

Management Outcome: All on-site staff are aware and understands the individual responsibilities in terms of this EMPr.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Course material must be available and presented in appropriate languages that all staff can understand.					

5.2 Site Establishment Development

Management Outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– A Method Statement must be provided by the Contractor prior to any on-site activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and laydown areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment	Contractor & cEO	Method Statement for site establishment and layout plan	ECO	Once-off approval of method statement On-going monitoring of implementation	Approved Method Statement and layout plan Environmental checklists and reports

Management Outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; – Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; – Sites must be located where possible on previously disturbed areas; – The camp must be fenced in accordance with ***Section 5.5: Fencing and Gate Installation;*** and – The use of existing accommodation for contractor staff, where possible, is encouraged.					

5.3 Access Restricted Areas

Management Outcome: Access to restricted areas prevented.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development; – Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and – Unauthorised access and development related activity inside access restricted areas is prohibited.	Contractor & cEO	Demarcation of Access restricted areas and staying within approved areas for construction	ECO & dEO	Once-off identification of access restricted areas On-going monitoring of implementation	Clearly marked access restricted areas Site inspection of No-Go areas

5.4 Access Roads

Management Outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; – All private roads used for access to the servitude	Contractor	Access roads must be identified, and agreements	ECO	Monthly	Access road inspection

Management Outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
must be maintained and upon completion of the works, be left in at least the original condition; – All Contractors must be made aware of all these access routes; – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the Contractor's expense; – Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; – In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with ***Section 4.9: Photographic Record***; prior to use and the condition thereof agreed by the landowner, the DPM, and the Contractor; – Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands; and – Access roads must only be developed on pre-planned and approved roads.		formalised before commencing construction			

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5.5 Fencing and Gate Installation

Management Outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Use existing gates provided to gain access to all parts of the area authorised for development, where possible; – Existing and new gates to be recorded and documented in accordance with ***Section 4.9: Photographic Record***; – All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; – -At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; – Care must be taken that the gates must be so erected that there is a gap of no more than 100mm between the bottom of the gate and the ground; – Where gates are installed in jackal-proof fencing, a suitable reinforced concrete sill must be provided beneath the gate;	Contractor	Controlled access to working areas	dEO & ECO	Monthly	Site inspection

Management Outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Original tension must be maintained in the fence wires; – All gates installed in electrified fencing must be re-electrified; – All demarcation fencing and barriers must be maintained in good working order for the duration of overhead transmission and distribution electricity infrastructure development activities; – Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas where applicable; – Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the landowner. – All fencing must be developed of high-quality material bearing the SABS mark; – The use of razor wire as fencing must be avoided; – Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times; – On completion of the development phase all					

Management Outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
temporary fences are to be removed; and – -The Contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.					

5.6 Water Supply Management

Management Outcome: Undertake responsible water usage.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All abstraction points or boreholes must be registered with the DHSW&S and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; – The Contractor must ensure the following: a) The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b) No damage occurs to the riverbed or banks	Contractor	Water from appropriately licensed sources Environmental awareness training	ECO & dEO	Monthly	Site inspection

Management Outcome: Undertake responsible water usage.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
and that the abstraction of water does not entail stream diversion activities; and c) All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. – Ensure water conservation is being practiced by: a) Minimising water use during cleaning of equipment; b) Undertaking regular audits of water systems; c) Including a discussion on water usage and conservation during environmental awareness training; and d) The use of grey water is encouraged.					

5.7 Storm and Wastewater Management

Management Outcome: Impacts to the environment caused by stormwater and wastewater discharges during construction are avoided.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the Project Manager; – All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; – Natural stormwater runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; – Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water	Contractor, PM & cEO	Method Statement for stormwater and wastewater management	ECO & dEO	Monthly	Site inspection Approved Method Statement

Management Outcome: Impacts to the environment caused by stormwater and wastewater discharges during construction are avoided.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
back into the environment must be subject to the Project Manager's approval and support by the ECO.					

5.8 Solid and Hazardous Waste Management

Management Outcome: Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All measures regarding waste management must be undertaken using an integrated waste management approach; – Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; – A suitably positioned and clearly demarcated waste collection site must be identified and provided; – The waste collection site must be maintained in a clean and orderly manner; – Waste must be segregated into separate bins and clearly marked for each waste type for recycling	Contractor & cEO	General camp house-keeping Provision of bins Awareness training on waste minimisation and re-use	dEO ECO	Weekly Bi-monthly	Provision of waste disposal facilities (bins & skips) Proof of Safe Disposal Certificates

Management Outcome: Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
and safe disposal; – Staff must be trained in waste segregation; – Bins must be emptied regularly; – General waste produced on-site must be disposed of at registered waste disposal sites/ recycling company; – Hazardous waste must be disposed of at a registered waste disposal site; – Certificates of safe disposal for general, hazardous and recycled waste must be maintained.					

5.9 Protection of Watercourses and Estuaries

Management Outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; – In the event of a spill, prompt action must be taken	Contractor & cEO	Method Statement for Working in Watercourses (if applicable)	dEO ECO	Weekly Bi-monthly	Approval and compliance with the Method Statement

Management Outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
to clear the polluted or affected areas; – Where possible, no development equipment must traverse any seasonal or permanent wetland; – No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur; – Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; – There must not be any impact on the long-term morphological dynamics of watercourses or estuaries; – Existing crossing points must be favoured over the creation of new crossings (including temporary access); – When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: a) Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse; b) During the execution of the works, appropriate measures to prevent pollution and					(if applicable)

Management Outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained; c) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and d) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.					

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5.10 Vegetation Clearing

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
General: – Indigenous vegetation which does not interfere with the development must be left undisturbed; – Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; – Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing; – Permits for removal must be obtained from the Department of Forestry, Fisheries and the Environment (DFFE) prior to the cutting or clearing of the affected species, and they must be filed; – The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals; – Trees felled due to construction must be documented and form part of the Environmental Audit Report;	Contractor & cEO	Woking within demarcated areas Invasive Alien Plant (IAP) eradication and control	dEO ECO	Weekly Monthly	Site inspection

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; – Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; – A daily register must be kept of all relevant details of herbicide usage; – No herbicides must be used in estuaries; – All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance with ***Section 5.3: Access Restricted Areas****; and* – Alien invasive vegetation must be removed and disposed of at a recognised waste disposal facility.					

5.11 Protection of Fauna

Management Outcome: Disturbance to fauna is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; – The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme; – Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present; – Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; – No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas; – No deliberate or intentional killing of fauna is allowed; – In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted	Contractor & cEO	Awareness training Injuring, capturing, killing of fauna identified on site must be reported	dEO & ECO	Monthly	Training material related to faunal management

Management Outcome: Disturbance to fauna is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
and causing power outages; and – No Threatened or Protected species (ToPs) and/ or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/ or relocated without appropriate authorisations/ permits.					

5.12 Protection of Heritage Resources

Management Outcome: Impact to heritage resources is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in ***Section 5.3: Access Restricted Areas***; – Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; – All work must cease immediately, if any human remains and/ or other archaeological,	Contractor & cEO	Working within approved areas for construction	dEO & ECO	Monthly	Site inspection

Management Outcome: Impact to heritage resources is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/ collect such material before development recommences.					

5.13 Safety of the Public

Management Outcome: All precautions are taken to minimise the risk of injury, harm or complaints.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.; – All unattended open excavations must be adequately fenced or demarcated; – Adequate protective measures must be	Contractor	Compilation of Health and Safety Plan Maintain Health and Safety File	Occupation Health & Safety Officer	Monthly	Health and safety inspections Investigation of major accident/

Management Outcome: All precautions are taken to minimise the risk of injury, harm or complaints.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; – Ensure structures vulnerable to high winds are secured; and – Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.					incidents

5.14 Sanitation

Management Outcome: Clean and well-maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Mobile chemical toilets are installed on-site if no other ablution facilities are available; – The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances; – Where mobile chemical toilets are required, the	Contractor	Provision of Ablution facilities during construction Management of	dEO ECO	Weekly Monthly	Proof of servicing and safe disposal

Management Outcome: Clean and well-maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
following must be ensured: a) Toilets are located no closer than 100m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr; d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out; e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards; and – A copy of the waste disposal certificates must be maintained.		facilities			

5.15 Prevention of Disease

Management Outcome: All necessary precautions linked to the spread of disease are taken.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Undertake environmentally-friendly pest control in the camp area; – Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; – The Contractor must ensure that information posters on AIDS are displayed in the Contractor camp area; – Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; – Free condoms must be made available to all staff on site at central points; – Medical support must be made available; and – Provide access to Voluntary HIV Testing and Counselling Services.	Contractor	Compilation of Health and Safety Plan Maintain Health and Safety File	Occupation Health & Safety Officer	Monthly	Health and safety inspections

5.16 Emergency Procedures

Management Outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; – The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; – All staff must be made aware of emergency procedures as part of environmental awareness training; – The relevant local authority must be made aware of a fire as soon as it starts; – In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented ***(Section 5.17: Hazardous Substances)***.	Contractor	ERAP Awareness Training	ECO	Monthly	Approved ERAP & training records

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5.17 Hazardous Substances

Management Outcome: Safe storage, handling, use and disposal of hazardous substances.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; – All hazardous substances must be stored in suitable containers as defined in the Method Statement; – Containers must be clearly marked to indicate contents, quantities and safety requirements; – All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill/ leak from the stored containers; – Bunded areas to be suitably lined with a SABS approved liner; – An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; – All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); – All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; – Employees handling hazardous substances/ materials must be aware of the potential impacts and follow appropriate safety measures.	Contractor	Method Statement for the handling, storage, use and disposal of hazardous substances	ECO	Monthly	Site inspection of hazardous storage areas and inspection of drip trays and impervious surfaces

Management Outcome: Safe storage, handling, use and disposal of hazardous substances.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
Appropriate personal protective equipment must be made available; – The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; – The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall); – The floor of the bund must be sloped, draining to an oil separator; – Provision must be made for refuelling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; – All empty externally dirty drums must be stored on a drip tray or within a bunded area; – No unauthorised access into the hazardous substances storage areas must be permitted; – No smoking must be allowed within the vicinity of					

Management Outcome: Safe storage, handling, use and disposal of hazardous substances.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
the hazardous storage areas; – Adequate fire-fighting equipment must be made available at all hazardous storage areas; – Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used; – An appropriately sized spill kit kept on-site relevant to the scale of the activity (ies) involving the use of hazardous substance must be available at all times; – The responsible operator must have the required training to make use of the spill kit in emergency situations; – An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; – In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to ***Section 5.7 Storm and Wastewater Management*** and ***Section 5.8 for Solid and Hazardous Waste Management***.					

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5.18 Workshop, Equipment Maintenance and Storage

Management Outcome: Soil, surface water and groundwater contamination is minimized.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; – During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; – Leaking equipment must be repaired immediately or be removed from site to facilitate repair; – Workshop areas must be monitored for oil and fuel spills; – Appropriately sized spill kit kept on-site relevant to the scale of the activity taking place must be available; – The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil/ water separator where maintenance work on vehicles and equipment can be performed; – Water drainage from the workshop must be contained and managed in accordance with	Contractor	Method Statement for workshop, equipment maintenance and storage	ECO	Monthly	Site inspection

Management Outcome: Soil, surface water and groundwater contamination is minimized.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
Section 5.7: Storm and Wastewater Management.					

5.19 Batching Plants

Management Outcome: Minimise spillages and contamination of soil, surface water and groundwater					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Concrete mixing must be carried out on an impermeable surface; – Batching plants areas must be fitted with a containment facility for the collection of cement laden water. – Dirty water from the batching plant must be contained to prevent soil and groundwater contamination; – Bagged cement must be stored in an appropriate facility and at least 10m away from any water courses, gullies and drains; – A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; – Hardened concrete from the washout facility or	Contractor	Method Statement for batching activities	ECO	Monthly	Site inspection

Management Outcome: Minimise spillages and contamination of soil, surface water and groundwater					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
concrete mixer can either be reused or disposed of at an appropriate licensed disposal facility; – Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; – Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to ***Section 5.20: Dust Emissions***); – Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; and – Temporary fencing must be erected around batching plants in accordance with ***Section 5.5: Fencing and Gate Installation***.					

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5.20 Dust Emissions

Management Outcome: Dust prevention measures are applied to minimise the generation of dust.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; – Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be revegetated or stabilised as soon as is practically possible; – Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; – During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; – Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; – Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO;	Contractor	Regular dust suppression Maintaining a dust suppression register	dEO ECO	Daily Monthly	Site inspection Dust suppression register Inspection of Complaints Register relating to dust

Management Outcome: Dust prevention measures are applied to minimise the generation of dust.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Vehicle speeds must not exceed 40km/h along dust roads or 20km/h when traversing unconsolidated and non-vegetated areas; – Straw stabilisation must be applied at a rate of one bale/ 10m² and harrowed into the top 100mm of top material, for all completed earthworks; and – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.					

5.21 Blasting

Management Outcome: Impact to the environment is minimised through a safe blasting practice.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Any blasting activity must be conducted by a suitably licensed blasting contractor; and – Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on site.	Contractor	Blasting Method Statement	ECO	Monthly	Blasting according to the Method Statement

5.22 Noise

Management Outcome: Unnecessary noise is prevented by ensuring that noise from construction activities is mitigated.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– The Contractor must keep noise level within acceptable limits, – Restrict the use of sound amplification equipment for communication and emergency only; – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; – Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; – Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.	Contractor	Compliance with SANS 10103 and OHS Act	dEO ECO	Daily Monthly	Inspection of Complaints Register

5.23 Fire Prevention

Management Outcome: Prevention of uncontrollable fires.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Designate smoking areas where the fire hazard could be regarded as insignificant; – Firefighting equipment must be available on all vehicles located on site; – The local Fire Protection Agency (FPA) must be informed of construction activities; – Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; – Two-way swop of contact details between ECO and FPA.	Contractor	Fire Prevention Plan	ECO	Monthly	Compliance with Fire Prevention Plan

5.24 Stockpiling and Stockpile Areas

Management Outcome: Erosion and sedimentation as a result of stockpiling are reduced.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored	Contractor	Method Statement to be	dEO ECO	Daily Bi-monthly	Site inspection and

Management Outcome: Erosion and sedimentation as a result of stockpiling are reduced.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
appropriately on site in order to minimise impacts to watercourses, wetlands and water bodies; – All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; – Stockpiles must not exceed 2m in height; – During periods of strong winds and heavy rain, the stockpiles should be covered with appropriate material (e.g. cloth, tarpaulin etc.); – Where possible, sandbags (or similar) should be placed at the bases of the stockpiled material in order to prevent erosion of the material.		compiled for stockpile management			compliance with Method Statement

5.25 Civil Works

Management Outcome: Impact to the environment minimised during civil works to create the substation terrace.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered	Contractor	Method Statement for civil works	dEO ECO	Daily Bi-monthly	Site inspection and

Management Outcome: Impact to the environment minimised during civil works to create the substation terrace.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
by yard stone; – Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards; – Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; – Rehabilitation of the disturbed areas must be managed in accordance with ***Section 5.34: Landscaping and Rehabilitation***; – All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and – Spoil can however be used for landscaping purposes and must be covered with a layer of 150mm topsoil for rehabilitation purposes.					compliance with Method Statement

5.26 Excavation of Foundation, Cable Trenching and Drainage Systems

Management Outcome: No environmental degradation occurs as a result of the excavation of foundation, cable trenching and drainage systems.

Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency	Evidence of Compliance
– All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a recognised disposal site, if not used for backfilling purposes; – Spoil can however be used for landscaping purposes and must be covered with a layer of 150mm topsoil for rehabilitation purposes; – Management of equipment for excavation purposes must be undertaken in accordance with ***Section 5.18: Workshop Equipment Maintenance and Storage***; – Hazardous substances spills from equipment must be managed in accordance with ***Section 5.17: Hazardous Substances***. – Batching of cement to be undertaken in accordance with ***Section 5.19: Batching Plants***; – Residual solid waste must be disposed of in accordance with ***Section 5.8: Solid and Hazardous Waste Management***.	Contractor cEO	Method Statement for excavation and installation of foundations	dEO ECO	Daily Monthly	Site inspection Approved Method Statement

5.27 Installation of Equipment (circuit breakers, current transformers, isolators, insulators, surge arresters, voltage transformers, earth switches)

Management Outcome: No environmental degradation occurs as a result of assembly and erecting of towers.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Management of dust must be conducted in accordance with ***Section 5. 20: Dust Emissions***; – Management of equipment used for installation must be conducted in accordance with ***Section 5.18: Workshop, Equipment Maintenance and Storage***; – Management hazardous substances and any associated spills must be conducted in accordance with ***Section 5.17: Hazardous Substances***; and – Residual solid waste must be recycled or disposed of in accordance with ***Section 5.8: Solid Waste and Hazardous Management***.	Contractor cEO	Standard Operating Procedure (SOP) for the installation of equipment	ECO dEO	Bi-monthly	Site inspection Approved SoP

5.28 Steelwork Assembly and Erection

Management Outcome: No environmental degradation occurs as a result of steelwork assembly and erection.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts. – Emergency repairs due to breakages of equipment must be managed in accordance with ***Section 5. 18: Workshop, Equipment Maintenance and Storage*** and ***Section 5.16: Emergency Procedures.***	Contractor cEO	Method Statement for steelwork assembly and erection	dEO ECO	Monthly	Site inspection Approved Method Statement

5.29 Cabling and Stringing

Management Outcome: No environmental degradation occurs as a result of stringing.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with ***Section 5.8: Solid Waste and Hazardous Management***; – Management of equipment used for installation shall be conducted in accordance with ***Section 5.18: Workshop, Equipment Maintenance and***	Contractor cEO	Method Statement for cabling and stringing	dEO ECO	Monthly	Site inspection Approved Method Statement

Management Outcome: No environmental degradation occurs as a result of stringing.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
Storage; – Management hazardous substances and any associated spills shall be conducted in accordance with ***Section 5.17: Hazardous Substances***.					

5.30 Testing and Commissioning (all equipment testing, earthing system, system integration)

Management Outcome: No environmental degradation occurs as a result of testing and commissioning.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Residual solid waste must be recycled or disposed of in accordance with ***Section 5.8: Solid Waste and Hazardous Management.***	Contractor cEO	SOP for testing and commissioning	dEO ECO	Monthly	Site inspection Approved SOP

5.31 Socio-economic

Management outcome: Socio-economic development is enhanced.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Develop and implement communication strategies to facilitate public participation; – Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; – Sustain continuous communication and liaison with neighbouring owners and residents; – Create work and training opportunities for local stakeholders; and – Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.	Contractor	Stakeholder engagement plan Communication plan	ECO	Bi-monthly	Site inspection Approved Stakeholder Engagement and communication plan

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5.32 Temporary Site Closure

Management Outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in ***Sections 5.17: Management of Hazardous Substances and 5.18 Workshop, Equipment Maintenance and Storage***; – Hazardous storage areas must be well ventilated; – Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; – Emergency and contact details displayed must be displayed; – Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; – Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; – Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; – Structures vulnerable to high winds must be secured; – Wind and dust mitigation must be implemented;	Contractor cEO	Method Statement for site closure greater than 5 days	ECO dEO	Bi-monthly	Site inspection Approved Method Statement

Management Outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– Cement and materials stores must have been secured; – Toilets must have been emptied and secured; – Refuse bins must have been emptied and secured; – Drip trays must have been emptied and secured.					

5.33 Dismantling of Old Equipment

Management Outcome: Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment; – Oil containing equipment must be stored to prevent leaking or be stored on drip trays; – All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers; – Once material has been scrapped and the contract has been placed for removal, the	Contractor cEO	Method Statement for the dismantling of old equipment	dEO ECO	Monthly	Site inspection Approved Method Statement

Management Outcome: Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment; – The Contractor must also be equipped to contain and clean up any pollution causing spills; and – Disposal of unusable material must be at a licensed waste disposal site.					

5.34 Landscaping and Rehabilitation

Management Outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed to a registered waste site;	Contractor cEO	Method Statement for landscaping	ECO dEO	Monthly	Site inspection

Management Outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
– All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; – All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; – Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition; – Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners; – Rehabilitation of tower sites and access roads outside of farmland; – Indigenous species must be used for with species and/ grasses to where it compliments or approximates the original condition; – Stockpiled topsoil must be used for rehabilitation (refer to ***Section 5.24: Stockpiling and Stockpiled***		and rehabilitation			Approved Method Statement

Management Outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
Areas); – Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; – Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; – Subsoil must be ripped before topsoil is placed; – The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; – Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. – The contract design specifications must be adhered to and implemented strictly; – Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. Where required, re-vegetation including					

Management Outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
hydro-seeding, can be enhanced using a vegetation seed mixture as described below. A mixture of seeds can be used provided the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area.					

6 ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with regulation 26 (h) of the Environmental Impact Assessment Regulations, 2014 as amended.

PART B: SECTION 2

7 SITE-SPECIFIC INFORMATION AND DECLARATION

7.1 Sub-section 1: Contact Details and Description of the Project

7.1.1 Details of the applicant:

Name of applicant: **Mr Itumeleng Moeng**
E-mail address: **MoengI@eskom.co.za**
Tel No: (**011) 8004114**
Fax No: **+27 86 665 2128**
Postal Address: **P O Box 1091, Sunninghill. Johannesburg, 2157**
Physical Address: **1 Maxwell Drive, Megawatt Park, Sunninghill, Johannesburg, 2157**

7.1.2 Details and expertise of the EAP:

Name of applicant: **Prashika Reddy (Royal HaskoningDHV)**
E-mail address: **prashika.reddy@rhdhv.com**
Tel No: **087 352 1577**Fax No: **Not applicable**
Expertise of the EAP (Curriculum Vitae included): **Prashika Reddy is a Senior Environmental Scientist with 19 years' experience in various environmental fields including: EIAs, EMPrs, PPP and environmental monitoring and audits. She is/ has been part of numerous multi-faceted large-scale projects, including the establishment of linear developments (roads and powerlines), industrial plants, electricity generation plants, mixed-use developments and mining projects. She is a Professional Natural Scientist (400133/10) with the South African Council for Natural Scientific Professions and a registered EAP with EAPASA.**

7.1.3 Project name:

The Development of a 400kV Loop-In-Loop-Out (LILO) Powerline to the Existing Eskom Garona Substation and Expansion/Upgrade of the Eskom Garona Substation on Portions 4; 5; 9 and the Remaining Extent of the Farm Bokpoort 390, Groblershoop, !Kheis Local Municipality

7.1.4 Description of the project:

Project DAO received a Cost Estimate Letter (CEL) from Eskom Holdings SOC Ltd (hereafter referred to as Eskom) as part of its solution towards the connection of the project to the National grid. The CEL indicated that additional strengthening of the Garona Substation will be required to in order to fully handle the capacity which would have been generated by the project. This further aligns to Eskom's planned multiple-grid strengthening projects across the country and due to the timelines, Eskom, are not able to undertake the project. As such, ACWA Power Project DAO (RF) Pty Ltd will be undertaking the additional work as part of the self-build agreement between the two entities after which the infrastructure will be handed over to Eskom for operations and maintenance.

The project consists of the following components:

- Loop-in to the existing Ferrum-Garona 400kV powerline to the Eskom Garona Substation;

- Loop-out into the existing Garona-Nieuwehoop 400kV powerline from the Eskom Garona Substation; and
- Upgrade and expansion of the Eskom Garona Substation to accommodate the additional electricity generated.

7.1.5 Project location:

The co-ordinates of for the project are provided in Table 2.

Table 2: Project coordinates

Component		Co-ordinates	Property Description
Expansion/Upgrade of the Garona Substation (Corner Points)	A	28°44'20.37"S; 21°59'37.32"E	Farm Bokpoort 390 Portion 4
	B	28°44'18.97"S; 21°59'36.76"E	
	C	28°44'18.18"S; 21°59'38.93"E	
	D	28°44'15.21"S; 21°59'37.81"E	
	E	28°44'13.63"S; 21°59'43.09"E	
	F	28°44'12.97"S; 21°59'45.06"E	
	G	28°44'17.31"S; 21°59'46.78"E	

7.2 Technical Description

The existing Garona Substation's footprint will expanded by 3.75ha (footprint – 150m x 250m) to accommodate the loop-in to the Ferrum-Garona 400kV powerline to the Garona Substation and then loop-out into the Garona-Nieuwehoop 400kV powerline (Figure 2 3).

In addition, the following work will be undertaken:

- Establish a 400kV busbar at Garona Substation.
- Establish and equip 2 x 400kV feeder bays.
- Extend the 132kV busbar at Garona Substation (to accommodate the 400/ 132kV transformer).
- Install a 500MVA 400/ 132kV transformer with associated transformer bays.
- Provide space for 1 future 400/ 132kV transformer.
- Equip and commission the 1x 132kV feeder bay.

7.3 Sub-section 2: Development Footprint Site Map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. Once the web-based screening tool identified in regulation 16(1) (v) of the Environmental Impact Assessment Regulations, 2014 is available, the sensitivity map must be prepared from this system. The map is to indicate areas/ features of sensitivity based on the findings of the assessment and illustrated according to four tiers, Very High, High, Medium or Low. The sensitivity map shall also identify the nature of each sensitive feature e.g. raptor nest, threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features in the surrounding landscape. The overhead transmission and distribution profile shall be illustrated at an appropriate resolution to enable fine scale interrogation. It is recommended that <20 m of overhead transmission and distribution length is

illustrated per page in A3 landscape format. Where considered appropriate, photographs of sensitive features in the context of tower positions shall be used.

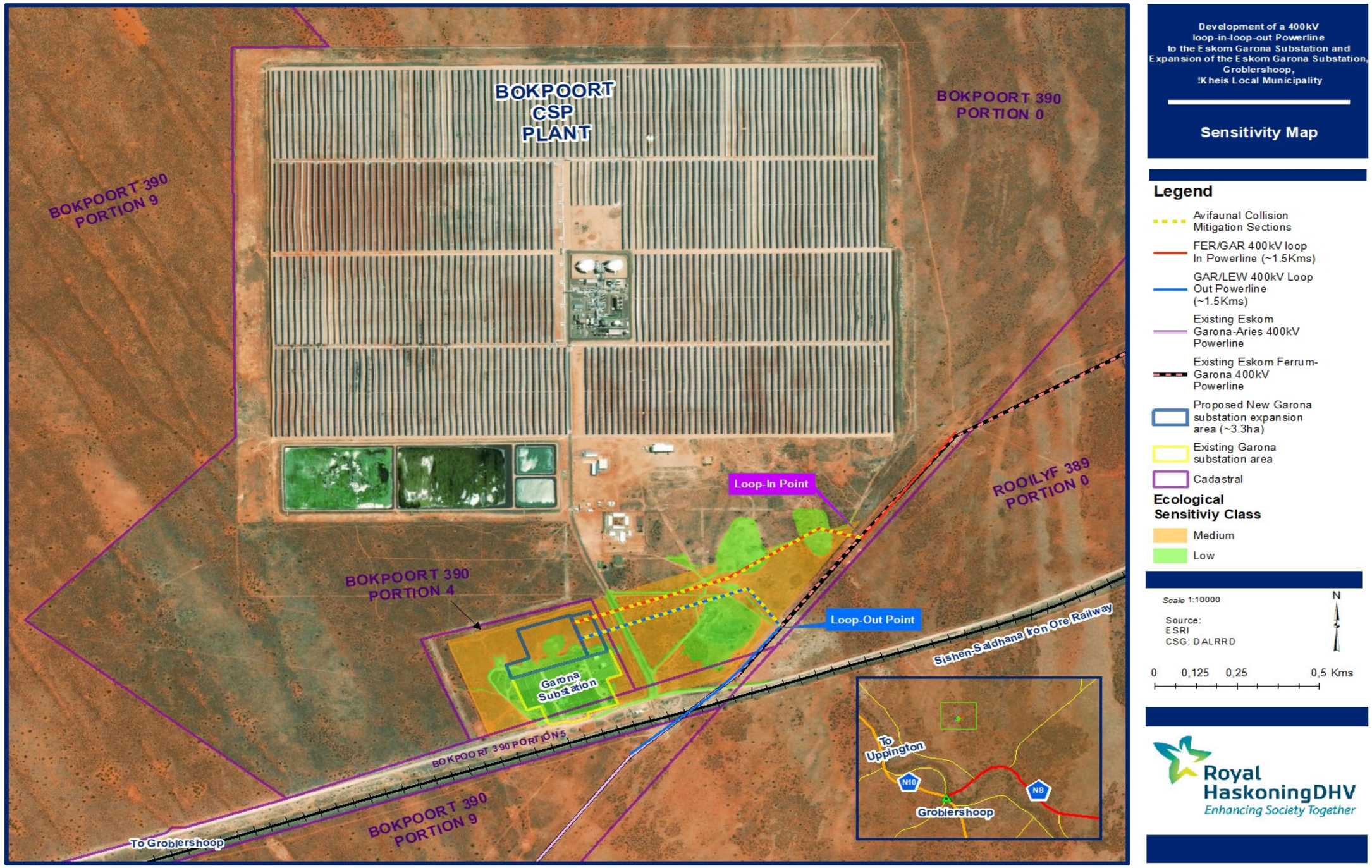

Figure 1: Sensitivity map

7.4 Sub-section 3: Declaration

The proponent or applicant or holder of EA affirms that they will abide and comply with the prescribed impact management outcomes and actions as stipulated in part B section 1 of the generic EMPr and have the understanding that the impact management outcomes and actions are legally binding.

Signature Proponent/applicant/ holder of EA Date:

TO BE SIGNED IN THE FINAL SUBMISSION

Royal HaskoningDHV

PART C

8 SITE-SPECIFIC ENVIRONMENTAL ATTRIBUTES

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

This section will not be required should the site contain no specific environmental sensitivities or attributes. If Part C is applicable to the site, it is required to be submitted to the competent authority for approval prior to commencement of the activity. Once approved, Part C forms part of the EMPr for the site and is legally binding.

8.1 Vegetation Clearing

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure. All construction work must comply with the conditions of the relevant authorisations, licences and permits.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Prior to site clearance, a detailed 'walkthrough' must be conducted to ascertain the number, abundance and physical conditions of all protected tree species (*Acacia erioloba*	Contractor & cEO Ecologist	Walkthrough DFFE and NCDAELR permits	dEO ECO	Once-off	All permits must be filed in the Site

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure. All construction work must comply with the conditions of the relevant authorisations, licences and permits.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
(Camel Thorn), *Acacia haematoxylon* (Grey Camel Thorn) and *Boscia albitrunca* (Shepherd's Tree) were observed in the project area) to assist with permit application (Department of Forestry, Fisheries and the Environment (DFFE)). ▪ Prior to site clearance, conduct a detailed 'walkthrough' of the proposed site to ascertain the number, abundance and physical conditions of all protected plant species and species of conservation concern to assist with permit application (Northern Cape Department for Agriculture, Environmental Affairs, Rural Development and Land Reform - NCDAELR). A Biodiversity Offset Feasibility Investigation has been conducted and the recommendations made by the NCDAERL must be taken into account. ▪ A comprehensive Alien Invasive Plant removal programme and vegetation/ecological monitoring programme must be drawn up and implemented. ▪ A biodiversity offset has been mandated for					Environmental File

Management Outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure. All construction work must comply with the conditions of the relevant authorisations, licences and permits.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
the Bokpoort Solar development, to ensure that all residual impacts associated with the development as a whole.					

8.2 Protection of Fauna (specifically Avifauna)

Management Outcome: Disturbance to fauna (specifically avifauna) is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ The appointed dEO must be trained by an avian specialist to identify the potential Red Data species as well as the signs that indicate possible breeding by these species. ▪ The dEO and ECO must then, during audits/ site visits, make a concerted effort to look out for such breeding activities of Red Data species, and such efforts may include the training of construction staff (e.g., in Toolbox talks) to identify Red Data species, followed by regular questioning of	Contractor dEO Avian specialist	Walkthrough Training on Red Data avifauna species Implement a Bird Monitoring Programme	dEO ECO	Once-off Monthly	Walkthrough reports by Avian specialist Training records Bird Monitoring Reports

Management Outcome: Disturbance to fauna (specifically avifauna) is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
staff as to the regular whereabouts on site of these species. ▪ If any of the Red Data species are confirmed to be breeding (e.g. if a nest site is found), construction activities within 500m of the breeding site must cease, and an avian specialist must be contacted immediately for further assessment of the situation and instruction on how to proceed. ▪ A construction phase bird monitoring programme must be implemented by an avian specialist, to document potential impacts on key species such as korhaans, bustards and eagles. ▪ Prevent birds from nesting in and around the substation through exclusion covers or spikes. ▪ Education and training and the enforcement of a strict policy against the killing of fauna.					

8.3 Protection of Heritage and Palaeontological Resources

Management Outcome: Impact to heritage and palaeontological resources is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ All discoveries must be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the ECO will advise the necessary actions to be taken. If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA. ▪ If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development,	Contractor cEO Archaeologist Palaeontologist	Working within approved areas for construction	dEO & ECO	Once-off	Site inspection

Management Outcome: Impact to heritage and palaeontological resources is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
SAHRA APM Unit (Natasha Higgitt/ Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule. ▪ If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/ Mimi Seetelo 012 320 8490) must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with a section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule. ▪ Known sites should be clearly marked in order that they can be avoided during construction activities. ▪ Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site. ▪ Contractors and workers must be advised of the penalties associated with the unlawful removal of cultural, historical,					

Management Outcome: Impact to heritage and palaeontological resources is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible Person/s	**Method of Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51(1).					

Appendix G:
Public Participation Summary Report

REPORT

Public Participation Report: Basic Assessment for the Development of a 400kV Loop-In-Loop-Out (LILO) Powerline to the Existing Eskom Garona Substation and Expansion/Upgrade of the Eskom Garona Substation on Portios 4; 5; 9 and the Remaining Extent of the Farm Bokpoort 390, Groblershoop

Public Participation Summary Report

Client:	ACWA Power Project DAO (RF) (Pty) Ltd/Eskom Holdings SoC Ltd
Reference:	MD4195-RHD-ZZ-XX-RP-YE-0001
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Royal HaskoningDHV
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Document title:	Public Participation Report: Basic Assessment for the Development of a 400kV Loop-In-Loop-Out (LILO) Powerline to the Existing Eskom Garona Substation and Expansion/Upgrade of the Eskom Garona Substation on Portios 4; 5; 9 and the Remaining Extent of the Farm Bokpoort 390, Groblershoop
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Project number:	MD4195
Author(s):	Seshni Govender

Drafted by:	Seshni Govender
Checked by:	
Date:	
Approved by:	
Date:	

Classification
Project related

Royal HaskoningDHV

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1 Introduction

1.1 Background

In September 2020, the Department of Mineral Resources and Energy (DMRE) released a request for proposal as part of the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) to reduce the current load shedding periods being experienced by the country. In responding to the request, ACWA Power led consortium submitted a bid for 150MWe under the name “Project DAO” and were successful.

Project DAO received a Cost Estimate Letter (CEL) from Eskom Holdings SoC Ltd (hereafter referred to as Eskom) as part of its solution towards the connection of the project to the national grid. The CEL indicated that additional strengthening of the Garona Substation will be required to in order to fully handle the capacity which would have been generated by the project. This further aligns to Eskom’s planned multiple-grid strengthening projects across the country and due to the timelines they are not able to undertake the project. As such, ACWA Power Project DAO (RF) Pty Ltd will be construct the additional work as part of the self - build agreement between the two entities after which the infrastructure will be handed over to Eskom.

The project consists of the following components:

- Loop in to the Ferrum-Garona 400kV line to the Eskom Garona Substation;
- Loop out into the Garona-Nieuwehoop 400kV line from the Eskom Garona Substation; and
- Upgrade and Expansion of the Eskom Garona Substation to accommodate the additional electricity generated.

1.2 Public Participation Process

Public Participation (PP) is a process that is designed to enable all interested and affected parties (I&APs) to voice their opinion and/or concerns which enables the practitioner to evaluate all aspects of the proposed development, with the objective of improving the project by maximising its benefits while minimising its adverse effects.

The PP Process must adhere to the requirements of Regulations 41 and 42 (GNR 982) as amended in 2017. Further, a PP guideline in terms of NEMA was issued by the Department of Forestry, Fisheries and the Environment in 2017, of which provisions will also be implemented.

A PP Plan was submitted and subsequently accepted by the Department on 18 June 2021 (**Appendix A**).

The PP Process for proposed project will be undertaken according to the stages outlined below as well as the requirements for the stakeholders.

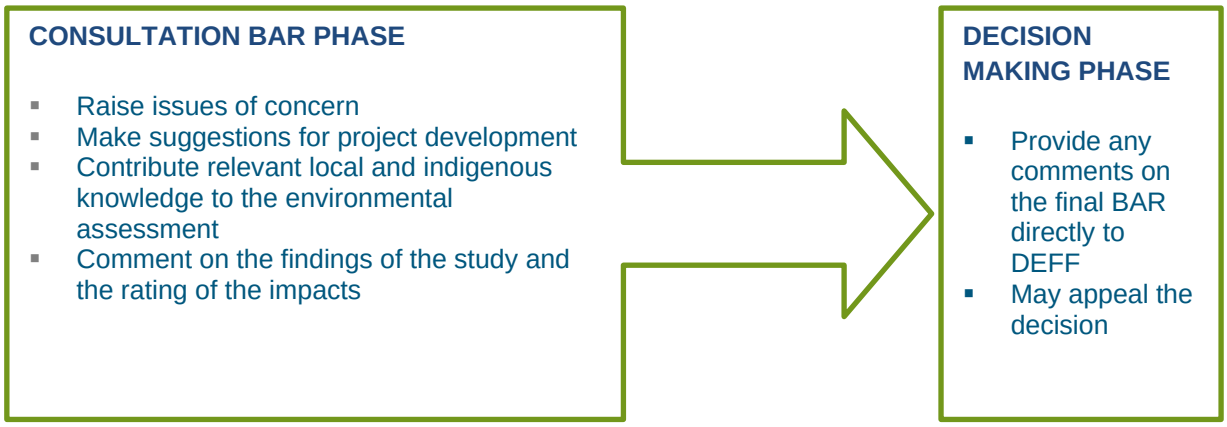


Figure 1-1: Responsibilities of I&APs

1.3 Purpose of the Report

The key purpose of this PP Summary Report is to:

- Summarise the PP Process undertaken for the BA study;
- Highlight what has been done to date;
- Synthesise the issues and concerns identified by I&APs and various stakeholders during the PP Process; and
- Synthesise comments on the proposed development.

1.4 Terms of Reference for Public Participation

The terms of reference for the implementation of a successful and robust PP Process, are as follows:

- Identification of I&APs in the vicinity of the study area;
- Provision to all I&APs of an opportunity to comment or raise concerns regarding the project;
- Maintenance of procedures for communication with I&APs and receiving, documenting and responding to relevant communication from I&APs;
- Identification and elimination of any sources of misunderstandings between the Applicant, EAP and the I&APs;
- Always aim to improve the communication between the Applicant, EAP and I&APs;
- Present the project in an objective way by supplying all appropriate, relevant and accurate information and facts in an unbiased manner to ensure a better understanding of the proposed project; and
- Ensure that the PP Process is an independent and transparent process.

1.5 Public Participation Summary

The PP Process commenced in June 2021 where Notification Document was distributed to the I&APs as well as commenting authorities. I&APs were introduced to the project and encouraged to register on the database.

Site notices were erected at strategic locations around the study area, which was also erected on 06 July 2021.

An advertisement will be placed in the Gemsbok Newspaper between 21 - 23 July 2021 followed by a commenting period which will provide an opportunity for the I&APs to raise their issues and concerns regarding the proposed activity.

2 Identification of I&APs

The first step in the PP Process entailed the identification of key I&APs and Stakeholders, including:

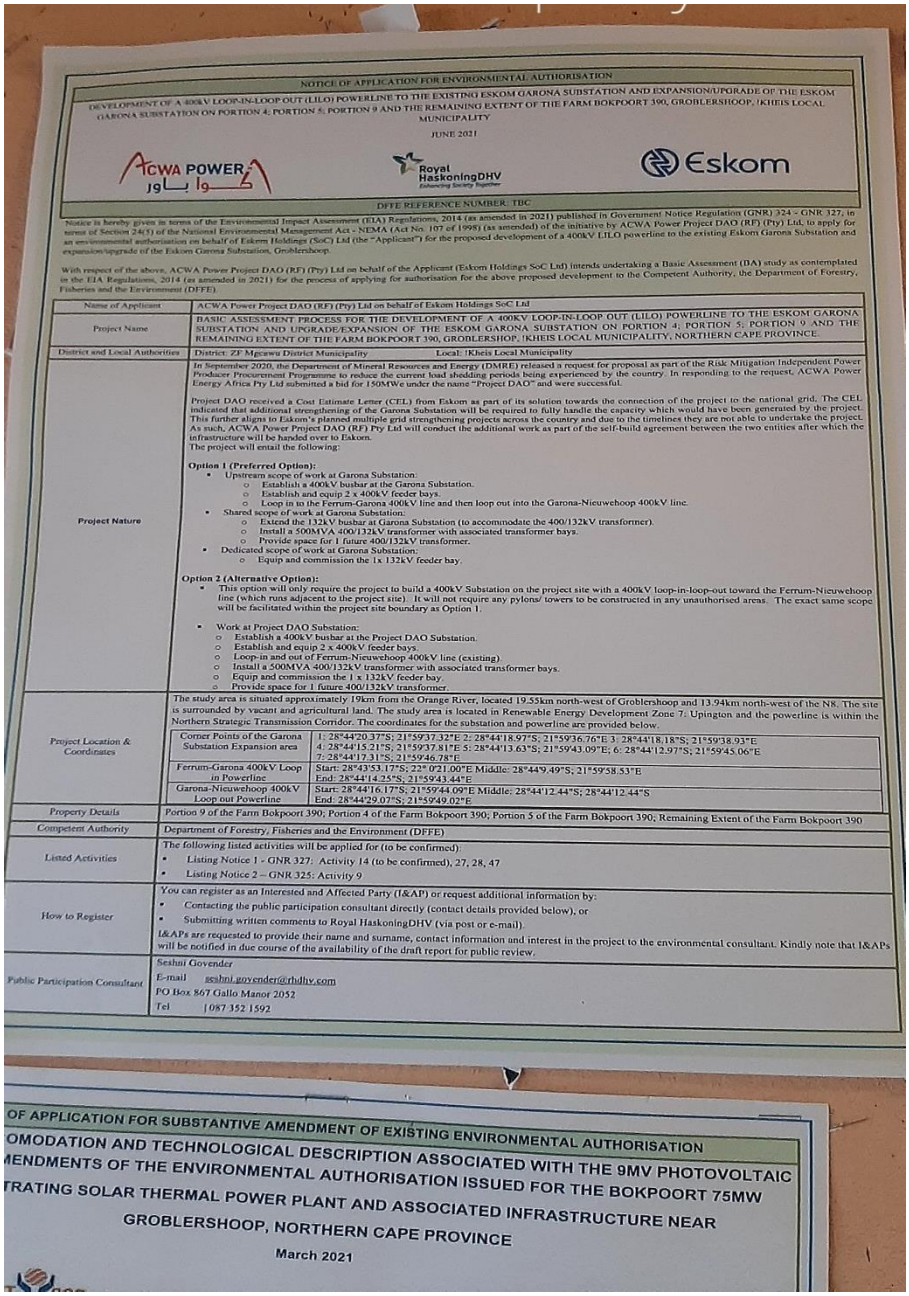
- Local and provincial government;
- Affected and neighbouring landowners; and
- General I&APs.

Proof of notification (**Appendix B**) has been compiled which has been maintained and updated throughout the duration of the BA study thus far.

3 Site Notices

The NEMA EIA Regulations 2014 (as amended) require that a site notice be fixed at a place conspicuous to the public at the boundary or on the fence of the site where the activity to which the application relates is to be undertaken and on any alternative sites. The purpose of this is to notify the public of the project and to invite the public to register as stakeholders and inform them of the PP Process. Royal HaskoningDHV erected site notices at various noticeable locations around the perimeter of the site and at strategic locations on or near the site (Groblershoop Town Notice Board and !Kheis Local Municipality Municipal Office Board).

3.1 Proof of Placement of Site Notices



NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION

DEVELOPMENT OF A 400kV LOOP-IN-LOOP OUT (LILO) POWERLINE TO THE EXISTING ESKOM GARONA SUBSTATION AND EXPANSION/UPGRADE OF THE ESKOM GARONA SUBSTATION ON PORTION 4; PORTION 5; PORTION 9 AND THE REMAINING EXTENT OF THE FARM BOKPOORT 390, GROBLERSHOOP, !KHEIS LOCAL MUNICIPALITY

JUNE 2021

ACWA POWER | Royal HaskoningDHV | Eskom

DFFE REFERENCE NUMBER: TBC

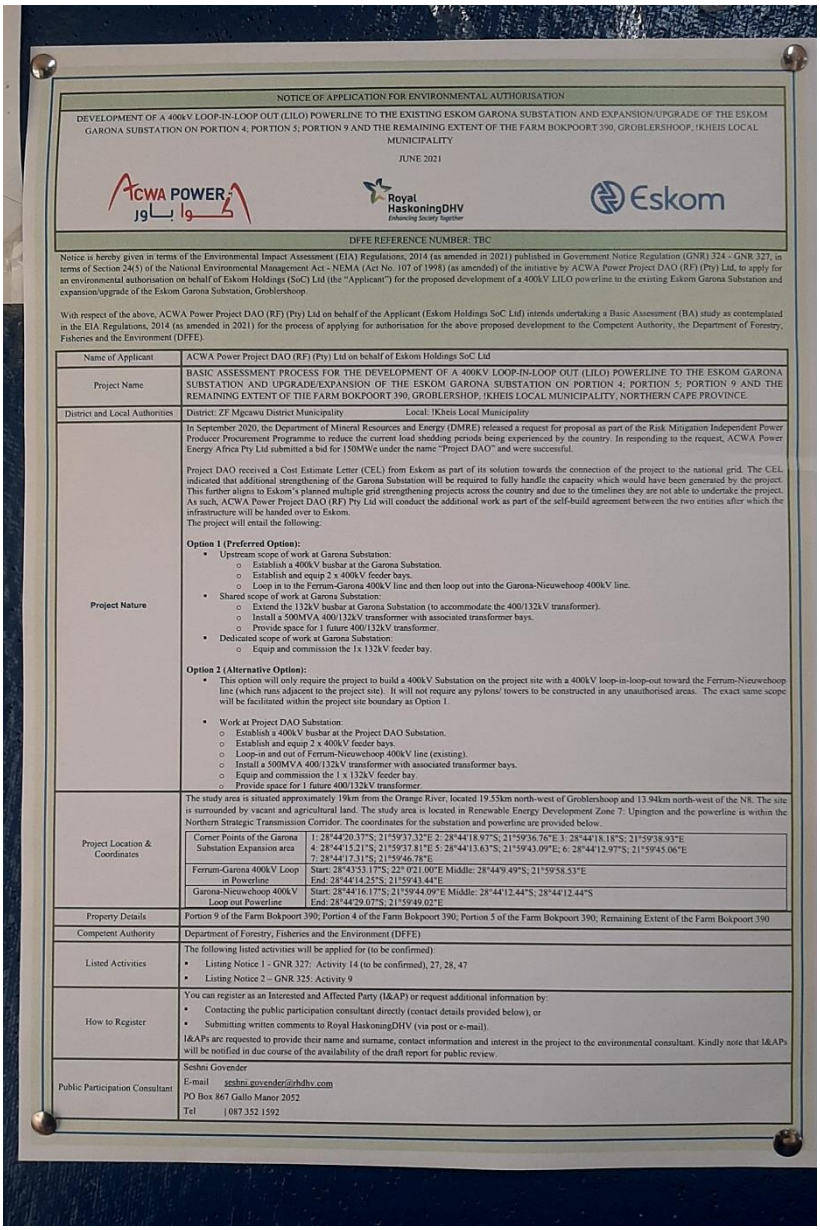
Notice is hereby given in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended in 2021) published in Government Notice Regulation (GNR) 324 – GNR 327, in terms of Section 24(5) of the National Environmental Management Act - NEMA (Act No. 107 of 1998) (as amended) of the initiative by ACWA Power Project DAO (RF) (Pty) Ltd, to apply for an environmental authorisation on behalf of Eskom Holdings (SoC) Ltd (the "Applicant") for the proposed development of a 400kV LILO powerline to the existing Eskom Garona Substation and expansion/upgrade of the Eskom Garona Substation, Groblershoop.

With respect of the above, ACWA Power Project DAO (RF) (Pty) Ltd on behalf of the Applicant (Eskom Holdings SoC Ltd) intends undertaking a Basic Assessment (BA) study as contemplated in the EIA Regulations, 2014 (as amended in 2021) for the process of applying for authorisation for the above proposed development to the Competent Authority, the Department of Forestry, Fisheries and the Environment (DFFE).

Name of Applicant	ACWA Power Project DAO (RF) (Pty) Ltd on behalf of Eskom Holdings SoC Ltd
Project Name	BASIC ASSESSMENT PROCESS FOR THE DEVELOPMENT OF A 400KV LOOP-IN-LOOP OUT (LILO) POWERLINE TO THE ESKOM GARONA SUBSTATION AND UPGRADE/EXPANSION OF THE ESKOM GARONA SUBSTATION ON PORTION 4; PORTION 5; PORTION 9 AND THE REMAINING EXTENT OF THE FARM BOKPOORT 390, GROBLERSHOP, !KHEIS LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE.
District and Local Authorities	District: ZF Mgcawu District Municipality — Local: !Kheis Local Municipality
Project Nature	In September 2020, the Department of Mineral Resources and Energy (DMRE) released a request for proposal as part of the Risk Mitigation Independent Power Producer Procurement Programme to reduce the current load shedding periods being experienced by the country. In responding to the request, ACWA Power Energy Africa Pty Ltd submitted a bid for 150MWe under the name "Project DAO" and were successful. Project DAO received a Cost Estimate Letter (CEL) from Eskom as part of its solution towards the connection of the project to the national grid. The CEL indicated that additional strengthening of the Garona Substation will be required to fully handle the capacity which would have been generated by the project. This further aligns to Eskom's planned multiple grid strengthening projects across the country and due to the timelines they are not able to undertake the project. As such, ACWA Power Project DAO (RF) Pty Ltd will conduct the additional work as part of the self-build agreement between the two entities after which the infrastructure will be handed over to Eskom. The project will entail the following: **Option 1 (Preferred Option):** ▪ Upstream scope of work at Garona Substation: o Establish a 400kV busbar at the Garona Substation. o Establish and equip 2 x 400kV feeder bays. o Loop in to the Ferrum-Garona 400kV line and then loop out into the Garona-Nieuwehoop 400kV line. ▪ Shared scope of work at Garona Substation: o Extend the 132kV busbar at Garona Substation (to accommodate the 400/132kV transformer). o Install a 500MVA 400/132kV transformer with associated transformer bays. o Provide space for 1 future 400/132kV transformer. ▪ Dedicated scope of work at Garona Substation: o Equip and commission the 1x 132kV feeder bay. **Option 2 (Alternative Option):** ▪ This option will only require the project to build a 400kV Substation on the project site with a 400kV loop-in-loop-out toward the Ferrum-Nieuwehoop line (which runs adjacent to the project site). It will not require any pylons/ towers to be constructed in any unauthorised areas. The exact same scope will be facilitated within the project site boundary as Option 1. ▪ Work at Project DAO Substation: o Establish a 400kV busbar at the Project DAO Substation. o Establish and equip 2 x 400kV feeder bays. o Loop-in and out of Ferrum-Nieuwehoop 400kV line (existing). o Install a 500MVA 400/132kV transformer with associated transformer bays. o Equip and commission the 1 x 132kV feeder bay. o Provide space for 1 future 400/132kV transformer.
Project Location & Coordinates	The study area is situated approximately 19km from the Orange River, located 19.55km north-west of Groblershoop and 13.94km north-west of the N8. The site is surrounded by vacant and agricultural land. The study area is located in Renewable Energy Development Zone 7: Upington and the powerline is within the Northern Strategic Transmission Corridor. The coordinates for the substation and powerline are provided below. Corner Points of the Garona Substation Expansion area: 1: 28°44'20.37"S; 21°59'37.32"E 2: 28°44'18.97"S; 21°59'36.76"E 3: 28°44'18.18"S; 21°59'38.93"E 4: 28°44'15.21"S; 21°59'37.81"E 5: 28°44'13.63"S; 21°59'43.09"E; 6: 28°44'12.97"S; 21°59'45.06"E 7: 28°44'17.31"S; 21°59'46.78"E Ferrum-Garona 400kV Loop in Powerline: Start: 28°43'53.17"S; 22° 021.00"E Middle: 28°44'9.49"S; 21°59'58.53"E End: 28°44'14.25"S; 21°59'43.44"E Garona-Nieuwehoop 400kV Loop out Powerline: Start: 28°44'16.17"S; 21°59'44.09"E Middle: 28°44'12.44"S; 28°44'12.44"S End: 28°44'29.07"S; 21°59'49.02"E
Property Details	Portion 9 of the Farm Bokpoort 390; Portion 4 of the Farm Bokpoort 390; Portion 5 of the Farm Bokpoort 390; Remaining Extent of the Farm Bokpoort 390
Competent Authority	Department of Forestry, Fisheries and the Environment (DFFE)
Listed Activities	The following listed activities will be applied for (to be confirmed): ▪ Listing Notice 1 - GNR 327: Activity 14 (to be confirmed), 27, 28, 47 ▪ Listing Notice 2 – GNR 325: Activity 9
How to Register	You can register as an Interested and Affected Party (I&AP) or request additional information by: ▪ Contacting the public participation consultant directly (contact details provided below), or ▪ Submitting written comments to Royal HaskoningDHV (via post or e-mail). I&APs are requested to provide their name and surname, contact information and interest in the project to the environmental consultant. Kindly note that I&APs will be notified in due course of the availability of the draft report for public review.
Public Participation Consultant	Seshni Govender E-mail: seshni.govender@rhdhv.com PO Box 867 Gallo Manor 2052 Tel: +27 (0)87 352 1592

OF APPLICATION FOR SUBSTANTIVE AMENDMENT OF EXISTING ENVIRONMENTAL AUTHORISATION
OMODATION AND TECHNOLOGICAL DESCRIPTION ASSOCIATED WITH THE 9MV PHOTOVOLTAIC
MENDMENTS OF THE ENVIRONMENTAL AUTHORISATION ISSUED FOR THE BOKPOORT 75MW
TRATING SOLAR THERMAL POWER PLANT AND ASSOCIATED INFRASTRUCTURE NEAR
GROBLERSHOOP, NORTHERN CAPE PROVINCE
March 2021

Figure 3-1: !Kheis Local Municipality Municipal Office Board



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JUNE 2021

ACWA POWER | Royal HaskoningDHV | Eskom

DFFE REFERENCE NUMBER: TBC

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Name of Applicant	ACWA Power Project DAO (RF) (Pty) Ltd on behalf of Eskom Holdings SoC Ltd
Project Name	BASIC ASSESSMENT PROCESS FOR THE DEVELOPMENT OF A 400KV LOOP-IN-LOOP OUT (LILO) POWERLINE TO THE ESKOM GARONA SUBSTATION AND UPGRADE/EXPANSION OF THE ESKOM GARONA SUBSTATION ON PORTION 4; PORTION 5; PORTION 9 AND THE REMAINING EXTENT OF THE FARM BOKPOORT 390, GROBLERSHOP, !KHEIS LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE.
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Project Nature	In September 2020, the Department of Mineral Resources and Energy (DMRE) released a request for proposal as part of the Risk Mitigation Independent Power Producer Procurement Programme to reduce the current load shedding periods being experienced by the country. In responding to the request, ACWA Power Energy Africa Pty Ltd submitted a bid for 150MWe under the name "Project DAO" and were successful. Project DAO received a Cost Estimate Letter (CEL) from Eskom as part of its solution towards the connection of the project to the national grid. The CEL indicated that additional strengthening of the Garona Substation will be required to fully handle the capacity which would have been generated by the project. This further aligns to Eskom's planned multiple grid strengthening projects across the country and due to the timelines they are not able to undertake the project. As such, ACWA Power Project DAO (RF) Pty Ltd will conduct the additional work as part of the self-build agreement between the two entities after which the infrastructure will be handed over to Eskom. The project will entail the following: **Option 1 (Preferred Option):** • Upstream scope of work at Garona Substation: o Establish a 400kV busbar at the Garona Substation. o Establish and equip 2 x 400kV feeder bays. o Loop in to the Ferrum-Garona 400kV line and then loop out into the Garona-Nieuwehoop 400kV line. • Shared scope of work at Garona Substation: o Extend the 132kV busbar at Garona Substation (to accommodate the 400/132kV transformer). o Install a 500MVA 400/132kV transformer with associated transformer bays. o Provide space for 1 future 400/132kV transformer. • Dedicated scope of work at Garona Substation: o Equip and commission the 1x 132kV feeder bay. **Option 2 (Alternative Option):** • This option will only require the project to build a 400kV Substation on the project site with a 400kV loop-in-loop-out toward the Ferrum-Nieuwehoop line (which runs adjacent to the project site). It will not require any pylons/ towers to be constructed in any unauthorised areas. The exact same scope will be facilitated within the project site boundary as Option 1. • Work at Project DAO Substation: o Establish a 400kV busbar at the Project DAO Substation. o Establish and equip 2 x 400kV feeder bays. o Loop-in and out of Ferrum-Nieuwehoop 400kV line (existing). o Install a 500MVA 400/132kV transformer with associated transformer bays. o Equip and commission the 1 x 132kV feeder bay. o Provide space for 1 future 400/132kV transformer.
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Public Participation Consultant	Seshni Govender E-mail seshni.govender@rhdhv.com PO Box 867 Gallo Manor 2052 Tel +27 (0)87 352 1592

Figure 3-2: Groblershoop Town Notice Board

4 Notification Document

A notification document that contained the project brief (**Appendix C**) for the project was compiled in English. The aim of this document is to provide a brief outline of the application and the nature of the development. It is also aimed at providing preliminary details regarding the BA study and explains how I&APs could become involved in the project. The document was distributed to all identified I&APs and stakeholders, together with details of the PP Consultant.

5 Advertisement

In compliance with the EIA Regulations (2014 as amended in 2017), notification of the commencement of the BA study for the project was advertised in a one local newspaper, the Gemsbok Newspaper on between 21 - 23 July 2021 in English (**Appendix D**).

I&APs were requested to register their interest in the project and become involved in the BA study. The primary aim of this advertisement was to ensure that the widest group of I&APs possible was informed and invited to provide input and questions and comments on the project. I&APs were also notified of the availability of the draft consultation BAR for public review.

6 Public Review of the Draft Consultation BAR

The draft cBAR has been made available for authority and public review for a total of 30 days from 21 July 2021 – 20 August 2021.

The report was made available at the following public locations within the study area, which are all readily accessible to I&APs:

- !Kheis Local Municipality Municipal Office;
- !Kheis Municipal Public Library - Groblershoop;
- Electronically on the Royal HaskoningDHV Website: https://www.royalhaskoningdhv.com/en/south-africa/projects/environmental-reports

7 Issues Trail

Issues and concerns raised to date on the project will be compiled into an Issues Trail and will be attached to this report with proof of comments. At this stage no comments have been received for the project

8 Environmental Authorisation

On receipt of environmental authorisation (positive or negative) for the project, I&APs registered on the project database will be informed of this authorisation and its associated terms and conditions by correspondence and advertisement.

Appendix A: PP Plan & Approval

[redacted]

Subject: RE: ACWA Project DAO - 400kV infrastructure
Date: Friday, 18 June 2021 14:06:02

Dear Malcom

Please note that the Minutes and PP Plan for the above referenced project is approved. Please include a copy of this approval, the minutes of the meeting and the PP Plan with your submission of application.

We concur that a Basic Assessment Process must be followed.

From: Malcolm Roods <Malcolm.Roods@rhdhv.com>
Sent: Tuesday, 15 June 2021 11:03
To: Herman Alberts <HAlberts@environment.gov.za>
Cc: Coenrad Agenbach <Cagenbach@environment.gov.za>; Lusani Jacqueeline Madali <LRathanya@acwapower.com>; Prashika Reddy <prashika.reddy@rhdhv.com>; Seshni Govender <seshni.govender@rhdhv.com>; Phumi Maake <PMaake@acwapower.com>
Subject: RE: ACWA Project DAO - 400kV infrastructure

Hallo Herman

My below e-mail to you refer

Did you have a change to look at the documents provided?

Project DAO is quite a critical project as mentioned in our pre-application consultation and your feedback is much appreciated

Kind regards

[redacted]

Subject: FW: ACWA Project DAO - 400kV infrastructure

Hi Herman

Trust you are doing well

Do you have any feedback for me on the below e-mail and confirmation?

Kind regards

[redacted]

Sent: 07 June 2021 08:40

[redacted]

Subject: ACWA Project DAO - 400kV infrastructure

Hi Herman

I attach the following information for you:

a. The draft minutes of our pre-application meeting for the Department's approval;
b. The map as discussed/required in our meeting which depicts the scope;
c. The PP Plan;
d. Google images of the substation site in 2004 and 2016 (this will show you how upgrades to the substation took place over time). ACWA now propose a further extension as indicated in blue in our App B map
e. The previous EA / RoDs as referred to in Appendix A - Table

At this stage and by looking at the facts, we as the EAP are confident that a new Basic Assessment process will be required for the loop in / out lines as well as the substation extension. The DFFE's confirmation in this regard would be much appreciated

Should you have any follow up clarification questions, please feel free to send them to me and I will relay it to the team on our side

Kind regards

Malcolm Roods
Environmental Consultant

T[redacted]

Royal HaskoningDHV
Enhancing Society Together

Minutes

Royal HaskoningDHV (Pty) Ltd
Southern Africa

Present:	Coenrad Agenbach (CA) (Department of Forestry, Fisheries and the Environment); Herman Alberts (HA) (Department of Forestry, Fisheries and the Environment); Malcolm Roods (MR) (Royal HaskoningDHV); Prashika Reddy (PR) Royal HaskoningDHV); Seshni Govender (SG) (Royal HaskoningDHV); Lusani Madali (LM) (ACWA Power Energy Africa); Phumi Maake (PM) (ACWA Power Energy Africa)
Apologies:	Muhammed Essop-Department of Forestry, Fisheries and the Environment
From:	Malcolm Roods
Date:	01 June 2021
Location:	Virtual Meeting via Microsoft Teams-Various Locations
Copy:	
Our reference:	MD4195-RHD-ZZ-XX-MI-YE-0001
Classification:	Project related
Enclosures:	

Subject: **Pre-application meeting for the ACWA Project DAO Grid Infrastructure Requirements**

Number	Details
1	CA welcomed everyone to the meeting and a round of introductions was done. One apology noted on behalf of Muhammed Essop
2	**Background:** Project DAO forms part of the he Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) that was awarded to ACWA Power as a preferred bidder to as well as being granted as a Strategic Infrastructure Project.
3	**Purpose:** The purpose of the meeting to discuss the Grid Infrastructure requirements for ACWA Power to evacuate the power generated from their PV Plants into the national Grid. The scope of the project includes a loop in loop out 400kV Powerline to the Garona Substation and the extension of the Garona Substation to accommodate this additional power.
4	**Discussion:** Eskom would be the applicant for this application but as they have expressed issues with finding ACWA Power will be undertaking this work on behalf of Eskom. MR stated that there have been a number of Environmental Authorisations/Record of Decisions issued over the years for Ferrum/ Garona Powerlines, Garona Substation and the Aries Powerlines, A table has been compiled to summarise all the authorisations for this project area.

Number	Details
	A NEMA EA was issued for the Proposed installation of 155km 400kV line between Ferrum and Garona substations in 2013 as well as an ECA RoD was issued for the Proposed Garona-Aries 400kV transmission line and upgrade of the existing Garona Substation in 2007, which was determined to be valid as construction of the respective lines and expansion of the Garona substation commenced. MR stated that the question to the department is based on the information and history provided will the proposed new 400kv and extension/upgrade of the Garona substation be subject to a new Basic Assessment study or can this fall in the ambit of an amendment to the approved authorisations. CA stated that due to the complexity and history of the project, the department will not be able to provide a response during this meeting as they require additional information in terms of a map indicating what has been authorised and been built as well as the new infrastructure and footprints. CA stated that the legalities of what is being proposed will need to be properly investigated as this may have an implication to the lenders and the department would be more comfortable taking a bit more time to provide a response to avoid any conflicts in the future. CA further stated that an interpretation Query will also need to be submitted to cross reference all the EAs and RoDs issued for the projects associated with the powerlines and the Garona Substation. CA confirmed that if a new process is to be conducted then it would most likely be a Basic Assessment Process, noting that it is within the Renewable Energy Development Zone and the Strategic Transmission Power Corridor.
5	**Way Forward:** <u>Royal HaskoningDHV/ACWA Power</u> ▪ Clear indication of what has been built and authorised as well as where the new infrastructure is going to be on a map ▪ Proper Project Description ▪ Submit all EAs/RoD's issued for the project area <u>Department of Forestry, Fisheries and the Environment:</u> ▪ Based on the information provided a response will be provided ▪ An Interpretation Query will be sent in order to determine the legality of the process
6	**Post Discussion- Royal HaskoningDHV & ACWA Power** Based on the advice received and looking at the mapping, a new proposal has been put forward that a new Basic Assessment process will be conducted for the new 400kV Powerline and the upgrade/extension to the Garona Substation.

ROYAL HASKONINGDHV (PTY) LTD
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+27 11 798 6005 **F**
Johannesburg@rhdhv.com **E**
royalhaskoningdhv.com **W**

Department of Environment, Forestry and Fisheries
Integrated Environmental Authorisations

Date:	03 June 2021	Contact name:	Malcolm Roods
Your reference:		Telephone:	071 674 7091
Our reference:	MD4195-RHD-ZZ-XX-CO-Z-0001	Email:	malcolm.roods@rhdhv.com
Classification:	Project related		

Public Participation Plan: Development of a 400kV loop in loop out Powerline to the Eskom Garona Substation and Expansion of the Eskom Garona Substation, Groblershoop, !Kheis Local Municipality

Dear Sirs/Mams

In September 2020, the Department of Mineral Resources and Energy (DMRE) released a request for proposal as part of the Risk Mitigation Independent Power Producer Procurement Programme to reduce the current load shedding periods being experienced by the country. in responding to the request, ACWA Power Energy Africa Pty Ltd (ACWA Power) submitted a bid for 150MWe under the name “Project DAO”.

A meeting was held with Eskom Holdings SOC Limited with regards to connection to the grid once Project DAO is in operation. Eskom has planned multiple-grid strengthening projects across the country and due to the timelines they are not able within their budget and timelines to meet these stringent timelines. As such, they have asked the Applicant (ACWA Power) to undertake this process which is the basis of this application.

The Project will entail the following:

- Upstream scope of work at Garona Substation:
  - Establish a 400kV busbar at the Garona Substation,
  - Establish and equip 2 x 400 kV feeder bays.
  - Loop in and out of Ferrum – Nieuwehoop 400kV lines (approx. 2 x 1.1km) into the Garona Substation.
- Shared scope of work at Garona Substation:
  - Extend the 132kV busbar at Garona Substation (to accommodate the 400/132kV transformer) - area of expansion proposed at the substation would be +/- 1 to 1.5ha,
  - Install a 500MVA 400/132kV transformer with associated transformer bays, and
  - Provide space for 1 future 400/132 kV transformer.

- Dedicated scope of work at Garona Substation:
    - Equip and commission the 1x 132kV feeder bay.

As per Government Gazette 43412 GN R. 650 Disaster Management Act (57/2002): Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to National Environmental Management Permits and Licences: Annexure 2 and 3 published on 5 June 2020, the DFFE requires a Public Participation (PP) Plan to be approved for an application for Environmental Authorisation that requires public participation.

PP is a process that is designed to enable all Interested and Affected parties (I&APs) to voice their opinion and/or concerns which enables the practitioner to evaluate all aspects of the proposed development, with the objective of improving the project by maximising its benefits while minimising its adverse effects.

I&APs include all interested stakeholders, technical specialists, and the various relevant organs of state who work together to produce better decisions.

The primary aims of the PP process are:

- to inform I&APs and key stakeholders of the proposed application and environmental studies;
- to initiate meaningful and timeous participation of I&APs;
- to identify issues and concerns of key stakeholders and I&APs with regards to the development;
- to promote transparency and an understanding of the project and its potential environmental (social and biophysical) impacts (both positive and negative);
- to provide information used for decision-making;
- to provide a structure for liaison and communication with I&APs and key stakeholders;
- to ensure inclusivity (the needs, interests and values of I&APs must be considered in the decision-making process);
- to focus on issues relevant to the project, and issues considered important by I&APs and key stakeholders; and
- to provide responses to I&AP queries.

The public participation process must adhere to the requirements of Regulations 41 and 42 (GN R.326). Further, a Public Participation guideline in terms of NEMA was issued by the DEA in 2017, of which provisions will also be implemented.

PUBLIC PARTICIPATION PLAN

1. Identification of I&APs

An I&AP database is already available due to previous projects undertaken on the same property. The I&AP database will be updated with new I&APs requesting to be registered and will be maintained throughout the duration of the project. All registered I&APs on the database will be informed of the project, review period as well as outcome of the decision issued by DFFE on the above-mentioned Basic Assessment process.

2. Advertisement

In compliance with the EIA Regulations 2014 (as amended in 2017), notification of the revised layout and EMPr and period for review will be advertised in the Gemsbok Newspaper. Hard copies of the draft cBAR and EMPr will be made available at the !Kheis Municipal Library and !Kheis Local Municipality for review and comment.

3. Review of the Draft Consultation Basic Assessment Report

The draft consultation Basic Assessment report (cBAR) and Environmental Management Programme (EMPr) will be made available electronically for review for 30 days, via the Royal HaskoningDHV Website as well as via email: https://www.royalhaskoningdhv.com/en/south-africa/projects/environmental-reports.

At the time of compilation of this document adjusted level 2 restriction Covid-19 restrictions are in place, therefore it is proposed that hard copies of the draft cBAR and EMPr be made available at the !Kheis Municipal Library and !Kheis Local Municipality for review and comment. These locations have been chosen as they are required to ensure that Covid-19 regulations and protocols are in place according to the Disaster Management Act, 2002.

Should the Covid-19 restrictions increase, the PP Plan will be adjusted with guidance from the DFFE to accommodate these restrictions whilst ensuring a robust and transparent process is conducted.

4. Meetings

No meetings are proposed for the project, however, should any I&AP specifically request a meeting, this will be held virtually.

5. Comments and Responses Report (CRR)

A CRR will be compiled with any comments and issues received and responded to which will form part of the submission of the final layout and EMPr to the Department.

Comments must be forwarded either via email, letter, by hand or via phone calls (documented in a letter or email thereafter) to:
Seshni Govender
PO Box, 867, Gallo Manor, 2052
Tel: 087 352 1592, Email: Seshni.govender@rhdhv.com

6. Environmental Authorisation

On receipt of the EA (positive or negative) for the proposed project, I&APs registered on the project database will be informed of this decision and its associated terms and conditions as well as the appeal process by email correspondence. An advert will be placed in the local newspaper in the Gemsbok Newspaper notifying I&APs of the decision.

Kind Regards
Malcolm Roods
EAP

Appendix B: Proof of Notification

From: Seshni Govender
[redacted]
Subject: Public Participation: Basic Assessment for the development of a Loop-In Loop-out 400kV Powerline and Expansion/Upgrade of the Eskom Garona Substation on the Portions: 4, 5, 9 and RE of the Farm Bokpoort 390, !Kheis Local Municipality
Date: Tuesday, 29 June 2021 13:25:00
Attachments: MD4195-RHD-ZZ-XX-CO-Z-0001-Initial Notification and BID.pdf

Dear Stakeholder

Notice is hereby given in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended in 2021) published in Government Notice Regulation (GNR) 324 - GNR 327, in terms of Section 24(5) of the National Environmental Management Act - NEMA (Act No. 107 of 1998) (as amended) of the initiative by being undertaken by ACWA Power Project DAO (RF) Pty Ltd on behalf of Eskom Holdings SoC Ltd for the development of a 400kV LILO Powerline to the existing Eskom Garona Substation and Expansion/Upgrade of the Eskom Garona Substation on Portions 4, 5, 9 and the Remaining Extent of the Farm Bokpoort 390, Groblershoop, !Kheis Local Municipality.

Please find attached initial notification and Background Information Document regarding the project.

Regards

Seshni Govender (*Pr. Sci. Nat.*)
Environmental Consultant

D 087 352 1592 | **E** seshni.govender@rhdhv.com | **W** www.rhdhv.co.za
Royal HaskoningDHV (Pty) Ltd trading as Royal HaskoningDHV | Reg No. 1966/001916/07
Building No. 5 Country Club Estate, 21 Woodlands Drive, Woodmead, 2191
PO Box 867, Gallo Manor, 2052, Gauteng, South Africa

Please, consider your environment.
Before printing this e-mail ask yourself: "Do I need a hard copy?"

From: Seshni Govender [redacted]

Subject: Public Participation: Basic Assessment for the development of a Loop-In Loop-out 400kV Powerline and Expansion/Upgrade of the Eskom Garona Substation on the Portions: 4, 5, 9 and RE of the Farm Bokpoort 390, !Kheis Local Municipality

Date: Tuesday, 29 June 2021 13:23:00

Attachments: MD4195-RHD-ZZ-XX-CO-Z-0001-Initial Notification and BID.pdf

Importance: High

Dear Stakeholder

Notice is hereby given in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended in 2021) published in Government Notice Regulation (GNR) 324 - GNR 327, in terms of Section 24(5) of the National Environmental Management Act - NEMA (Act No. 107 of 1998) (as amended) of the initiative by being undertaken by ACWA Power Project DAO (RF) Pty Ltd on behalf of Eskom Holdings SoC Ltd for the development of a 400kV LILO Powerline to the existing Eskom Garona Substation and Expansion/Upgrade of the Eskom Garona Substation on Portions 4, 5, 9 and the Remaining Extent of the Farm Bokpoort 390, Groblershoop, !Kheis Local Municipality.

Please find attached initial notification and Background Information Document regarding the project.

Regards

Seshni Govender (*Pr. Sci. Nat.*)
Environmental Consultant

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Royal HaskoningDHV (Pty) Ltd trading as Royal HaskoningDHV | Reg No. 1966/001916/07
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From: Seshni Govender
[redacted]

Subject: Public Participation: Basic Assessment for the development of a Loop-In Loop-out 400kV Powerline and Expansion/Upgrade of the Eskom Garona Substation on the Portions: 4, 5, 9 and RE of the Farm Bokpoort 390, !Kheis Local Municipality

Date: Tuesday, 29 June 2021 13:25:00

Attachments: MD4195-RHD-ZZ-XX-CO-Z-0001-Initial Notification and BID.pdf

Importance: High

Dear Stakeholder

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Please find attached initial notification and Background Information Document regarding the project.

Regards

Seshni Govender (*Pr. Sci. Nat.*)
Environmental Consultant

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